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Groundwater Monitoring and Investigation Report

Snohomish Square Cleaners
Avenue D and 13th Street SE
Snohomish, WA

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ABBREVIATIONS AND ACRONYMS

Abbreviation/ Acronym	Definition
bgs	Below ground surface
COC	Contaminant of concern
CUL	Cleanup level
cVOCs	Chlorinated volatile organic compounds
DO	Dissolved oxygen
EPA	U.S. Environmental Protection Agency
EPI	Environmental Partners, Inc.
ERD	Enhanced reductive dechlorination
Holt	Holt Drilling Services
HSA	Hollow-stem auger
IAWP	Interim Action Work Plan
IRA	Interim remedial action
µg/L	Micrograms per liter
mg/L	Milligrams per liter
MTCA	Model Toxics Control Act
ORP	Oxidation-reduction potential
PCE	Tetrachloroethene
PDB	Passive diffusion bag
psi	Pounds per square inch
PVC	Polyvinyl chloride
Skotdal	Skotdal Enterprises, Inc.
TCE	Trichloroethylene
TOC	Total organic carbon

1.0 INTRODUCTION

Environmental Partners, Inc. (EPI) is pleased to submit this *Groundwater and Investigation Monitoring Report* to address groundwater impacted by tetrachloroethene (PCE) at the former Snohomish Square Cleaners property located at Avenue D and 13th Street SE in Snohomish, Washington (subject property). Skotdal Enterprises, Inc. (Skotdal) currently owns the subject property. The location of the subject property is indicated in Figure 1.

PCE was historically released at the subject property, which has resulted in impacts to soil and groundwater. Based on site-specific data, the sole remaining contaminant of concern (COC) is PCE in groundwater. The breakdown products of PCE include trichloroethylene (TCE), cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride. As the sequential reductive dechlorination of PCE occurs, these less chlorinated daughter products might become future COCs. The groundwater impacts have migrated downgradient (to the southwest) to a property owned by Snohomish County. The "Site," as defined by the Model Toxics Control Act (MTCA), includes portions of the subject property as well as the "upper terrace" of the downgradient property to the southwest owned by Snohomish County (Snohomish property). The locations of the subject property and Snohomish property are depicted in Figure 2.

Enhanced reductive dechlorination (ERD), which is an *in situ* bioaugmentation remediation technology, was selected as the remedial technology to bring groundwater at the Snohomish property into regulatory compliance. A pilot study performed at the Site showed ERD to be an effective remedial technology in consideration of the Site-specific goals and current and future Site uses.

EPI completed an *Interim Remedial Action Report* (IRA) dated January 30, 2017 that established baseline groundwater conditions, documented the first round of ERD treatment, and discussed results of two groundwater monitoring events. The initial purpose of this implementation of ERD is to reduce PCE impacts to shallow groundwater at the subject property in order to obtain a "No Further Action" (NFA) determination for the Site.

2.0 GROUNDWATER SAMPLING PROCEDURES

Unless otherwise noted, the groundwater sampling procedures presented in the following paragraphs were followed during each monitoring event.

Prior to sampling, static water levels were measured and recorded to the nearest 0.01-foot using a Solinst electronic water level meter (or equivalent). To ensure consistency, all static water level measurements were taken to consistent measuring points on the north side of the top edge of the polyvinyl chloride (PVC) casing. EPI surveyed measuring point elevations for all monitoring wells and used those data, along with measured depth-to-water data, to calculate groundwater elevations, elevation contours, and flow directions at the Site.

Wells selected for groundwater sampling were purged using a peristaltic pump and low-flow purging techniques. Pump tubing was new, single-use tubing that was changed between each well. During low-flow purging, groundwater field parameters were measured and recorded approximately every 3 minutes for the following parameters:

- pH
- Temperature
- Oxidation-reduction potential (ORP)
- Specific conductivity
- Dissolved oxygen (DO)

Low-flow purging was continued until these field parameters met stabilization criteria for three successive readings. Turbidity measurements will be included in low-flow purging samples going forward.

After stabilization, groundwater sample containers were labeled and samples were collected into appropriate laboratory-supplied sample containers using low-flow sampling techniques to limit potential contaminant volatilization. Immediately upon collection, filled sample containers were placed in an iced cooler to maintain an internal temperature of 4° Celsius or less for submittal to the analytical laboratory. All samples were transported under standard chain-of-custody protocols to Friedman and Bruya, Inc. (FBI) an analytical laboratory located in Seattle, Washington.

Selected wells were sampled using a passive diffusion bag (PDB). This method was tested side-by-side with low-flow sampling methods in 2016 and it was determined that PDB sampling was a feasible option. PDB sampling requires less time and generates less waste when compared to low-flow purging and sampling methods. During the December 2016 baseline monitoring event described below, the PDB bags were installed in the selected wells immediately following the completion of low-flow sampling at each well. The PDBs then remained in the wells for a minimum of 2 weeks to achieve equilibrium conditions with the groundwater before being sampled.

All groundwater samples were submitted for chlorinated volatile organic compounds (cVOCs) analysis by U.S. Environmental Protection Agency (EPA) Method 8260B. Selected groundwater samples were also analyzed for total organic carbon (TOC) by EPA Method 415.1; chemical oxygen demand (COD) by EPA Method 410.4; biological oxygen demand (BOD; 5-Day) by EPA Method 5210B; total and dissolved iron and manganese by EPA Method 6010B; chloride by EPA Method 325.1; sulfate/sulfide and nitrate/nitrite by EPA Method 300.0; and methane, ethane, and ethane, and carbon dioxide by Method RSK-175.

3.0 GROUNDWATER MONITORING – DECEMBER 2016

3.1 Groundwater Sampling

From December 1 through December 2, 2016, EPI sampled groundwater at 24 well locations. Procedures in Section 2.0 were followed for sampling. Fifteen of the 24 wells were sampled using PDB on December 2, 2016.

3.2 Piezometric Conditions

Measured depth-to-water data ranged from 2.08 to 20.94 feet below the top of casing. Depth-to-water measurements are presented in Tables 1 and 2. The resulting groundwater elevation data indicate that groundwater flow direction at the subject property is generally in a south-southwest direction with a horizontal hydraulic gradient of 0.012 feet/foot. Both the groundwater flow direction and the magnitude of the horizontal hydraulic gradient are influenced to some degree by seasonal conditions. Figure 3 depicts groundwater flow directions and elevations from the December 2016 monitoring event.

3.3 Geochemical Conditions

Geochemical analytical data for this monitoring event are presented in Tables 1 and 2. Geochemical parameters were analyzed from wells MW-1, MW-2, MW-3, MW-4, MW-7, MW-8, MW-9, MW-15, GW-4, and GW-11.

TOC was detected in three groundwater samples, MW-1, MW-3, and MW-7, at concentrations ranging from 1,300 µg/L to 34,000 µg/L (Table 1). These numbers indicate a sharp decrease in TOC concentrations across the Site. This decrease in TOC indicates that bacteria are consuming carbon in the subsurface.

Anaerobic conditions in groundwater can be evaluated by measuring concentrations of iron and manganese in groundwater and using those data as a qualitative guide to the redox status. Metals analysis for iron and manganese are also used to indicate if enhanced reducing geochemical conditions have produced unacceptable metals concentrations. Field-filtered (dissolved) groundwater samples were analyzed for iron and manganese. Iron was detected in eight groundwater samples at concentrations ranging from 50.2 µg/L to 11,700 µg/L. Unfiltered iron concentrations in MW-6 and MW-7 decreased significantly during this monitoring event. Manganese was detected in all eight groundwater samples at concentrations ranging from 1.2 µg/L to 2,440 µg/L (Table 2).

The comparison of sulfate/sulfide and nitrate/nitrite concentrations provide a measure of reducing conditions produced by substrate injection. These analyses indicate the effects of increased biological activity and provide evidence that reducing conditions are present. Sulfate was detected in concentrations ranging from 640 µg/L to 19,100 µg/L. Nitrate was detected in concentrations ranging from less than 25 µg/L to 16,300 µg/L (Table 1). These baseline concentrations were low and support prior conclusions that significant biological degradation of PCE was not occurring naturally. As reducing conditions are created by the substrate injections, sulfate should reduce to sulfide and nitrate should reduce to nitrogen gas or ammonia.

Field parameter data for the baseline sampling are presented in Table 3. DO ranged from 1.02 mg/L to 7.46 mg/L. ORP values ranged from -3.9 millivolts (mv) to 114.7 mv. Geochemical conditions generally are considered aerobic when DO concentrations are approximately 1 mg/L or greater and ORP values are positive, or anaerobic, and when DO concentrations are less than 1 mg/L and ORP values are negative. Temperature, pH, and other field-measured parameters were within acceptable ranges for bioremediation to occur. EPI will consider adding a pH buffer in the future to maintain acceptable ranges for pH.

3.4 Analytical Results

PCE concentrations were detected at concentrations ranging from 1.2 µg/L to 190 µg/L. Nine of the 24 sample results were greater than the MTCA Method A GW CUL of 5 µg/L, with the greatest concentration in the sample from MW-15. PCE was detected at concentrations less than the MTCA Method A GW CUL for PCE in seven other monitoring wells (Table 2). Figure 4 shows the PCE concentrations in groundwater and the horizontal extent of the PCE plume based on data obtained during the December 2016 baseline monitoring event.

The breakdown products of PCE include TCE, cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride. TCE was detected in three samples at concentrations ranging from 1.1 µg/L to 85 µg/L. One of the sample results was greater than the MTCA Method A GW CUL of 5 µg/L. Cis-1,2-dichloroethene was detected in three samples at concentrations ranging from 1.3 µg/L to 62 µg/L. Two of the sample results were greater than the MTCA Method B GW CUL of 16 µg/L. Trans-1,2-dichloroethene was not detected in any samples. Vinyl chloride was detected in two samples at concentrations of 6.4 µg/L in MW-10 and 5.7 µg/L in MW-11, both of which are greater than the MTCA Method A GW CUL of 0.2 µg/L (Table 2). Analytical results are included in Attachment A.

4.0 GROUNDWATER MONITORING – FEBRUARY 2017

4.1 Groundwater Sampling

From February 20 through February 21, 2017, EPI sampled groundwater at 25 well locations. Procedures in Section 2.0 were followed for sampling. Sixteen of the 25 wells were sampled using PDB on February 21, 2017.

4.2 Piezometric Conditions

Depth-to-water measurements in wells ranged from approximately 1.31 to 20.89 feet below top of casing. Depth-to-water measurements are provided in Tables 1 and 2. Figure 5 depicts groundwater elevations and the groundwater flow direction at the subject and Snohomish properties as measured during the February 2017 monitoring event.

Water level data collected in February 2017 indicated that groundwater flow direction at the Site is generally in the south-southwest direction with a horizontal hydraulic gradient of 0.011 feet/foot. Both the groundwater direction and horizontal gradient are consistent with the baseline monitoring event.

4.3 Geochemical Results

Geochemical analytical data for this monitoring event are presented in Tables 1 and 2. Geochemical parameters were analyzed from wells MW-1, MW-2, MW-3, MW-4, MW-7, MW-8, MW-9, MW-15, GW-4, and GW-11.

TOC was detected in all groundwater samples, except in the sample from MW-9, at concentrations ranging from 510 µg/L to 76,000 µg/L (Table 1). These data indicate an increase in TOC concentrations across the Site. In general, the wells farther away from the injection wells did not show as much increase in TOC as the source area wells, which are closer to the injection wells. This increase in TOC was the basis for performing the additional injection event described in Section 5.0.

Iron was detected in eight groundwater samples at concentrations ranging from 56 µg/L to 37,500 µg/L. Manganese was detected in eight groundwater samples at concentrations ranging from 3 µg/L to 5,170 µg/L (Table 2). Iron and manganese concentrations in source area well MW-3 significantly increased during this monitoring event and will be monitored over the upcoming monitoring events.

Anions (i.e., chloride, sulfate and nitrate) were analyzed to provide a measure of geochemical conditions produced by substrate injection. Chloride was detected in eight wells at concentrations ranging from 1,240 µg/L to 134,000 µg/L. Chloride concentrations significantly increased in all wells except in the sample from MW-15. Sulfate was detected in concentrations ranging from 780 µg/L to 21,400 µg/L. Sulfate concentrations significantly increased in wells MW-8 and GW-11, and remained relatively the same in the remaining wells. Nitrate was detected in concentrations ranging from 399 µg/L to 11,200 µg/L (Table 1). Generally, nitrate concentrations decreased during this monitoring event.

Field parameter data for the February sampling event are presented in Table 3. DO ranged from 0.36 mg/L to 9.97 mg/L. ORP ranged from -34.1mv to 231.4 mv.

4.4 Analytical Results

PCE concentrations were detected at concentrations ranging from 1.1 µg/L to 140 µg/L. Seven of the 25 sample results were greater than the MTCA Method A GW CUL of 5 µg/L, with the greatest concentration in the sample from MW-15. PCE was detected at concentrations less than the MTCA Method A GW CUL for PCE in eight other monitoring wells (Table 2). Figure 6 shows the PCE groundwater concentrations and plume as identified during the February 2017 monitoring event.

The breakdown product TCE was detected in three wells at concentrations ranging from 1.2 µg/L to 8.0 µg/L with one of the sample results, from well MW-11, was greater than the MTCA Method A GW CUL of 5 µg/L. Cis-1,2-dichloroethene was detected in samples from five wells at concentrations ranging from 3.3 µg/L to 25 µg/L. Two of the sample results were greater than the MTCA Method B GW CUL of 16 µg/L. Vinyl chloride was detected in samples from three wells at concentrations ranging from 1.1 µg/L to 7.4 µg/L. All three detected vinyl chloride concentrations were greater than the MTCA Method A GW CUL of 0.2 µg/L (Table 2). Analytical results are included in Attachment A.

5.0 REMEDIAL ACTION IMPLEMENTATION

5.1 Injection of Treatment Compound

5.1.1 Injection Compound

As discussed in the IAWP, ERD was selected as the most readily implementable and applicable remediation technology for the Site. ERD requires the introduction of a nutrient substrate that provides a carbon source to stimulate bacterial populations to use up available dissolved oxygen and drive geochemical conditions to be more anaerobic. The nutrient substrate also provides a hydrogen releasing compound that serves as an electron donor to enhance the ability of the natural biota to reductively dechlorinate PCE. EPI selected a proprietary product called 3-D Microemulsion® by Regenesis because it has a documented record of successful remediation by ERD at similar sites.

5.1.2 Injection Technique

3-D Microemulsion® injections began on February 22, 2017 using a pressurized injection method into the three treatment areas described in the IAWP, shown on Figure 2. Potable water was mixed in a 275-gallon water tote with the two-ingredient 3-D Microemulsion® solution (three parts 3-D Microemulsion® and one part chemical reducer) at a ratio of 10 parts water to 1 part 3-D Microemulsion® mixture. The tote was then mixed until homogeneous using the circulating valve on the injection pump.

Valves and gauges located on the injection pump allowed for the operator to manage flow and document pressures within the injection wells. Flow rate was controlled by a gate valve located on the discharge side of the injection pump.

Injections were initiated on February 22 and were completed on February 24, 2017. Details of well injections are noted in Table 4, displaying dates and total volumes injected into each well. In some of the wells, leakage at the surface around the well annulus was noted and was caused by location-specific geologic conditions that limited infiltration rates. If leakage occurred at the surface, pressurized injections were stopped and gravity feed methods were used to reduce the potential for leakage at the surface. Wells that were partially gravity fed are noted in Table 4. In general, each well took approximately 42 pounds per square inch (psi) to overcome the piezometric head of the water column within the well. When the static piezometric head pressure was overcome, injection pressures dropped to approximately 15 to 20 psi for the duration of injection. A total volume of 11,380 gallons of the nutrient substrate mixture was injected into the subsurface. Details of well injections are noted in Table 4 with dates and total substrate volumes injected into each well.

Evaluation of data generated by ongoing groundwater monitoring will determine if additional injections are required.

6.0 GROUNDWATER MONITORING – MAY 2017

6.1 Groundwater Sampling

From May 24 through May 30, 2017, EPI sampled groundwater at 25 well locations. Procedures in Section 2.0 were followed for sampling. Sixteen of the 25 wells were sampled using PDB on May 25 and 26, 2017.

6.2 Piezometric Conditions

Depth-to-water measurements in wells ranged from approximately 1.30 to 22.07 feet below top of casing. Depth-to-water measurements are provided in Tables 1 and 2. Figure 7 depicts groundwater elevations and the groundwater flow direction at the subject and Snohomish properties as measured during the May 2017 monitoring event.

Water level data collected in May 2017 indicate that groundwater flow direction at the property is generally in the south-southwest direction with a horizontal hydraulic gradient of 0.012 feet/foot. Both the groundwater direction and horizontal gradient will be monitored in the future.

6.3 Geochemical Results

Geochemical analytical data for this monitoring event are presented in Tables 1 and 2. Geochemical parameters were analyzed from wells MW-1, MW-2, MW-3, MW-4, MW-7, MW-8, MW-9, MW-15, GW-4, and GW-11.

TOC was detected in all groundwater samples, except in the sample from MW-9, at concentrations ranging from 600 µg/L to 72,000 µg/L (Table 1). These data indicate continuation of a general increase in TOC concentrations across the Site. The increase in TOC concentrations indicates that the substrate injections distributed 3-D Microemulsion® throughout the subsurface as intended. In general, the wells farther away from the injection wells did not show as much increase in TOC as the source area wells.

Iron was detected in eight groundwater samples at concentrations ranging from 60 µg/L to 30,200 µg/L. Manganese was detected in nine groundwater samples at concentrations ranging from 1 µg/L to 4,530 µg/L (Table 2). Iron and manganese concentrations in source area well MW-1 significantly increased during this monitoring event. The concentration at this monitoring well will be monitored over the upcoming monitoring events to evaluate if metals concentrations exceed MTCA Method A GW CULs.

Anions (i.e., chloride, sulfate and nitrate) were analyzed to provide a measure of geochemical conditions produced by substrate injection. Chloride was detected in samples from eight wells at concentrations ranging from 2,600 µg/L to 617,000 µg/L. Chloride concentrations significantly increased in well MW-7. Sulfate was detected in samples from nine wells at concentrations ranging from 780 µg/L to 25,400 µg/L. Sulfate concentrations significantly increased in wells MW-3, MW-7, and GW-11, and increased slightly or remained relatively the same in the remaining wells. Nitrate was detected in samples from nine wells at concentrations ranging from 753 µg/L to 7,700 µg/L (Table 1). Generally, nitrate concentrations remained consistent with previous monitoring events.

Field parameter data for the May sampling are presented in Table 3. DO ranged from 0.22 mg/L to 8.18 mg/L. ORP ranged from 3.1 mv to 187.4 mv.

6.4 Analytical Results

PCE concentrations were detected at concentrations ranging from 1.0 µg/L to 120 µg/L (Table 1). Seven of the 25 sample results were greater than the MTCA Method A GW CUL of 5 µg/L, with the greatest concentration in the sample from MW-15. PCE was detected at concentrations less than the MTCA Method A GW CUL for PCE in five other monitoring wells. Figure 8 shows the PCE groundwater concentrations and plume as identified during the May 2017 monitoring event.

The breakdown product TCE was detected in three wells at concentrations ranging from 1.5 µg/L to 2.7 µg/L. None of the sample results were greater than the MTCA Method A GW CUL of 5 µg/L. Cis-1,2-dichloroethene was detected in samples from seven wells at concentrations ranging from 1.1 µg/L to 26 µg/L. Two of the sample results were greater than the MTCA Method B GW CUL of 16 µg/L. Vinyl chloride was detected in samples from three wells at concentrations ranging from 2.1 µg/L to 4.1 µg/L (Table 1). All three samples were at concentrations greater than the MTCA Method A GW CUL of 0.2 µg/L. Analytical results are included in Attachment A.

7.0 DATA EVALUATION

Tables 1 and 2 summarize the groundwater analytical data. Due to the large number of wells and volume of data, the analytical results are most clearly presented graphically. PCE concentrations are shown in a graphical representation of the analytical data on Figure 9. Figures 4, 6, and 8 illustrate, on a quarter-by-quarter basis, the estimated extent of PCE concentrations in groundwater exceeding the MTCA Method A GW CUL.

Figure 9 is a graphical time series representation of the total detected concentrations of PCE for each quarterly monitoring event. That is, the sum of PCE concentrations from each of the wells sampled, on a quarter-by-quarter basis. This graphical depiction of PCE concentrations is representative of the general concentrations of PCE in groundwater at the Site over time. For the number of wells present and the observed concentrations, this analysis provides a general indication of Site-wide trends in PCE concentrations. Figure 9 depicts an overall decline in PCE concentrations in response to the remedial action.

Using the regression trend line, PCE has decreased in concentration by approximately 42 percent since the baseline monitoring event and subsequent injection. While concentrations remain elevated, this trend represents a clear improvement in groundwater quality at the Site and the effectiveness of injection event. With the successful distribution of the 3-D Microemulsion® this improving trend in PCE concentrations is expected to continue. After the May 2017 sampling event, 66.3 percent of the remaining total PCE concentration is represented by groundwater at wells MW-5 and MW-15.

Figures 4, 6, and 8 represent the lateral extent of PCE-impacted groundwater, which extends off-property to the southwest beneath Avenue D and onto the Snohomish Property. The lateral extent of impacts to the aquifer, as indicated by PCE concentrations, is well characterized and is delineated by the existing monitoring well network.

8.0 MW-5 INVESTIGATION

During EPI's 2015 baseline sampling event prior to implementing remedial actions, PCE was detected in groundwater samples from MW-5. Since quarterly groundwater monitoring began in February 2016, PCE concentrations in samples from MW-5 have been consistently greater than the MTCA Method A GW CULs despite its upgradient location from the assumed source plume.

On June 26 and 27, 2017, EPI installed three monitoring wells, identified as MW-16 through MW-18, in the gravel area north of the shopping center, as shown on Figure 10. The purpose of these wells was to provide repeatable and defensible monitoring points to determine if the impacts observed in MW-5 are separate and distinct from the main remediation plume.

The borehole for each well was advanced to the bottom depth of 25 feet below ground surface (bgs) using a using a standard truck mounted hollow-stem-auger (HSA) drilling rig equipped with 10-inch diameter auger flights. Flush-threaded 2-inch diameter PVC casing with 10 feet of machine-cut 10-slot (0.010-inch) well screen was then installed and backfilled with 10-20 silica sand filter pack from the bottom of the boring to 1 foot above the top of the screened interval.

On June 27 and 28, 2017, EPI installed three temporary soil borings in the gravel area north of the shopping center within 10 feet of MW-5. The purpose of these borings was to investigate soil impacts in the vicinity of MW-5. These borings were completed using standard HSA techniques with 10-inch diameter auger flights. Two borings were completed to 15 feet bgs (DPT-2 and DPT-3) and one boring was completed to 20 feet bgs (DPT-1). Depth to groundwater varied among the borings from approximately 15 to 17 feet bgs.

Soil was sampled from the monitoring wells and temporary borings and screened for the presence of VOCs with a photoionization detector (PID). Lithologic characteristics, PID readings, and other field observations were recorded on a field log for each location. The boring logs for MW-16 through MW-18 and DPT-1 through DPT-3 are included in Attachment B.

A total of nine soil samples were submitted for laboratory analysis from the three temporary borings. All samples collected from the borings were submitted for cVOC analysis using the EPA Method 8260C.

A total of three water samples were submitted for laboratory analysis from the three monitoring wells. Wells were purged and sampled following low-flow procedures described in Section 2.0. All samples collected from the monitoring wells and borings were submitted for cVOC analysis using EPA Method 8260C.

No cVOCs were detected in soil or water at concentrations exceeding an applicable analytical detection limit (ADL) from any of the samples collected.

8.1 Piezometric Conditions

Depth-to-water measurements in wells ranged from approximately 2.48 to 22.82 feet below top of casing. A new survey was performed to provide a consistent set of measuring point elevations for wells at the Site, including the newly installed groundwater monitoring wells. A summary of the newly surveyed measuring point elevations and depth-to-water measurements is provided in Table 5. Figure 10 depicts groundwater elevations and the groundwater flow direction at the Site as measured during this July 2017 monitoring event.

According to the bore logs from the newly installed MW-17 and MW-18, these wells are in area of increased silt, which differs from the geology observed at other areas at the Site. Groundwater elevations from these two wells are significantly lower than other wells at the Site. This increased silt with the addition of historically low precipitation may have created a localized anomalous area where groundwater elevations are lower than normal and may not be indicative of regional static groundwater conditions.

Data collected in July 2017 indicate that groundwater flow direction at the property is generally in the south-southwest direction with a horizontal hydraulic gradient of 0.01 feet/foot. This gradient confirms that MW-5 is the most upgradient well at the Site and is upgradient from the source area.

9.0 CONCLUSIONS

The following conclusions are supported by the findings of the December 2016 monitoring event, the substrate injection event, and two follow-up quarterly groundwater monitoring events.

- Groundwater elevation data from four monitoring events indicate that the predominant groundwater flow direction at the Site is generally in a south-southwest direction with a horizontal hydraulic gradient of approximately 0.01 feet/foot.

- The current monitoring network and monitoring frequency are appropriate for the observed Site-specific conditions.

- Additional 3-D Microemulsion® injections began on February 22, 2017 using a pressurized injection method. Over the duration of the injection period, 3,300 gallons of the nutrient substrate mixture were injected into the subsurface at 8 locations.

- There is a demonstrable trend of decreased total concentration of PCE in groundwater since the first injection event, which was performed in March and April of 2016. The total concentration of PCE in groundwater has decreased by approximately 42 percent since the baseline monitoring event.

- Based on data from the May 2017 sampling event, 66.3 percent of the remaining concentrations of PCE in groundwater is represented by groundwater at MW-5 and MW-15.

  EPI will continue to monitor MW-15 and possibly add an injection well to this area, if data from this monitoring well continue to display the highest detected amount of PCE at the Site.

- PCE concentrations at MW-5 will continue to be monitored. Three new monitoring wells were installed downgradient of MW-5 to investigate potential connectivity to the Snohomish Cleaners remediation plume. No cVOCs were detected in groundwater samples collected from these newly installed wells. Additionally, three soil borings were advanced near MW-5. No cVOCs were detected in soil at concentrations exceeding an ADL from any of the samples collected.

  The presence of PCE in groundwater at MW-5 does not appear to be related to the source area at the Site due to its upgradient location and the documented lack of PCE in groundwater at well locations between the source area and MW-5. These impacts appear to be related to a separate and distinct upgradient source not related to the former release associated with the Site.

- As the sequential reductive dechlorination of PCE occurs, some of the lesser chlorinated daughter products have been detected at concentrations greater than their respective MTCA CULs and therefore might become COCs for the Site. The presence of these compounds will continue to be monitored and evaluated throughout the remediation process.

- EPI will complete an August 2017 monitoring event and will determine the time frame for a potential additional substrate injection event based on the results from that event.

Tables

Table 1
Groundwater Geochemical Analytical Data (µg/L)
Groundwater Monitoring and Investigation Report
Snohomish Square Cleaners
1419 Avenue D, Snohomish, Washington

Sample ID	Depth to Water (feet)	Sample Date	Conventionals	Demand			Minerals		Nutrients		Dissolved Gasses[f]			
			Total Sulfide[a]	BOD[b]	TOC[c]	COD[d]	Chloride[e]	Sulfate[e]	Nitrite[e]	Nitrate[e]	Carbon Dioxide	Methane	Ethane	Ethene
MW-1	6.68	2/9/2016	--	<2,000	**3,900**	**16,000**	**24,300**	**7,450**	<5	**10,500**	**120,000**	**31**	<10	<10
	8.96	5/17/2016	<50	<2,000	**7,500**	**13,000**	**43,300**	**7,820**	--	**2,300[g]**	**110,000**	**26**	<10	<10
	11.17	8/30/2016	<50	<2,000	**86,000**	<10,000	**29,400**	**11,500**	<5	**3,380**	**120,000**	<5	<10	<10
	6.32	12/1/2016	<50	<2,000	**5,200**	**11,000**	**18,500**	**4,490**	<5	**4,900**	**70,000**	**29**	<10	<10
	6.18	2/21/2017	<50	<2,000	**8,400**	**18,000**	**26,200**	**4,300**	<5	**995**	**130,000**	<5	<10	<10
	7.73	5/25/2017	<50	<2,000	**9,600**	<10,000	**36,200**	**5,500**	<5	**901**	**370,000**	**9.0**	<10	<10
MW-2	7.67	2/9/2016	--	<2,000	**4,200**	<10,000	**1,560**	**2,260**	<5	**17,200**	**13,000**	<5	<10	<10
	11.02	5/17/2016	**80**	<2,000	**700**	<10,000	**4,500**	**9,410**	<5	**10,200**	**61,000**	<5	<10	<10
	13.31	8/29/2016	<50	<2,000	**15,000**	<10,000	**4,640**	**13,800**	<5	**6,380**	**72,000**	<5	<10	<10
	7.12	12/2/2016	<50	<2,000	<500	<10,000	**1,240**	**640**	<5	**16,300**	**14,000**	<5	<10	<10
	6.89	2/20/2017	<50	<2,000	**2,700**	<10,000	**1,240**	**1,130**	<5	**11,200**	**--**	<5	<10	<10
	9.39	5/30/2017	<50	**98,000**	**72,000**	**270,000**	**27,300**	**770**	<5	<25	**35,100**	<5	<10	<10
MW-3	4.49	2/9/2016	--	<2,000	**520**	<10,000	**22,300**	**11,900**	<5	**2,180**	**79,000**	<5	<10	<10
	8.35	5/17/2016	<50	**14,000**	**120,000**	**1,300,000**	**10,400**	**6,540**	--	<10[g]	**100,000**	<5	<10	<10
	10.82	8/29/2016	<50	**55,000**	**300,000**	**1,100,000**	**9,880**	**510**	<5	<25	**200,000**	**620 ve (640)**	<10 (<100)	<10 (<100)
	4.72	12/2/2016	<50	**19,000**	**34,000**	**110,000**	**7,590**	**700**	<5	<25	**79,000**	**1,500 ve (1,800)**	<10	<10
	4.09	2/20/2017	<50	**83,000**	**76,000**	**430,000**	**34,500**	**780**	<5	<25	**130,000**	**6,100 ve (8,000)**	<10	<10
	6.37	5/30/2017	<50	<2,000	**9,300**	<10,000	**4,100**	**22,400**	<5	**7,700**	**445,000**	**3,300 ve (3,300)**	<10	<10
MW-4	8.93	5/20/2016	<50	<2,000	**790**	**18,000**	**11,300**	**13,800**	<5	**1,230**	--	--	--	--
MW-7	9.82	2/9/2016	--	<2,000	**2,600**	**13,000**	**191,000**	**15,700**	<5	**4,400**	**86,000**	<5	<10	<10
	11.07	5/17/2016	<50	<2,000	**1,300**	<10,000	**172,000**	**10,800**	--	**2,600[g]**	**75,000**	<5	<10	<10
	13.46	8/30/2016	<50	**15,000**	**2,200**	**34,000**	**267,000**	**26,100**	<5	**3,020**	**96,000**	<5	<10	<10
	9.67	12/1/2016	<50	<2,000	**1,300**	<10,000	**275,000**	**7,770**	<5	**4,090**	**78,000**	<5	<10	<10
	9.77	2/21/2017	<50	<2,000	**5,700**	<10,000	**134,000**	**12,300**	<5	**5,300**	**82,000**	<5	<10	<10
	10.36	5/25/2017	<50	<2,000	**1,200**	<10,000	**617,000**	**17,600**	<5	**4,400**	**137,000**	<5	<10	<10
MW-8	9.45	2/9/2016	--	<2,000	**570**	<10,000	2,620	**24,400**	<5	**1,150**	**91,000**	<5	<10	<10
	11.03	5/17/2016	<50	<2,000	**3,200**	<10,000	**4,530**	**26,600**	--	**380[g]**	**130,000**	**17**	<10	<10
	12.89	8/29/2016	**60**	<2,000	**11,000**	<10,000	**3,760**	**9,570**	<5	**2,000**	**110,000**	<5	<10	<10
	9.54	12/2/2016	<50	<2,000	<500	<10,000	**2,380**	**19,100**	<5	**1,180**	**52,000**	<5	<10	<10
	9.50	2/21/2017	<50	<2,000	**510**	<10,000	**2,100**	**21,400**	<5	**1,300**	**59,000**	<5	<10	<10
	10.21	5/24/2017	<50	<2,000	**650**	<10,000	**2,600**	**21,600**	<5	**1,000**	**145,000**	<5	<10	<10
MW-9	6.00	2/9/2016	--	<2,000	<500	<10,000	**4,360**	**8,230**	<5	**1,050**	**76,000**	<5	<10	<10
	9.27	5/17/2016	<50	<2,000	<500	<10,000	**17,000**	**43,100**	<5	<25	**67,000**	<5	<10	<10
	11.78	8/29/2016	<50	<2,000	**12,000**	<10,000	**3,770**	**9,570**	<5	**2,000**	**110,000**	<5	<10	<10
	6.43	12/2/2016	<50	<2,000	<500	<10,000	**4,110**	**6,790**	<5	**943**	**60,000**	<5	<10	<10
	6.06	2/21/2017	<50	<2,000	<500	<10,000	**4,000**	**6,800**	<5	**713**	**69,000**	<5	<10	<10
	7.71	5/25/2017	<50	<2,000	<500	<10,000	**5,080**	**8,100**	<5	**753**	**92,800**	<5	<10	<10

Table 1
Groundwater Geochemical Analytical Data (µg/L)
Groundwater Monitoring and Investigation Report
Snohomish Square Cleaners
1419 Avenue D, Snohomish, Washington

Sample ID	Depth to Water (feet)	Sample Date	Conventionals	Demand			Minerals		Nutrients		Dissolved Gasses[f]			
			Total Sulfide[a]	BOD[b]	TOC[c]	COD[d]	Chloride[e]	Sulfate[e]	Nitrite[e]	Nitrate[e]	Carbon Dioxide	Methane	Ethane	Ethene
MW-15	8.42	5/17/2016	<50	<2,000	**700**	<10,000	**12,600**	**11,800**	--	**2,200[g]**	**67,000**	<5	<10	<10
	10.42	8/30/2016	<50	<2,000	**20,000**	<10,000	**12,400**	**11,800**	<5	**1,280**	**87,000**	<5	<10	<10
	6.48	12/1/2016	<50	<2,000	<500	<10,000	**6,940**	**8,420**	<5	**7,290**	**54,000**	<5	<10	<10
	6.36	2/21/2017	<50	<2,000	**690**	<10,000	<50	**10,400**	<5	**4,700**	**67,000**	<5	<10	<10
	7.51	5/25/2017	<50	<2,000	**1,000**	**<10,000**	**10,400**	**12,400**	<5	**1,900**	**116,000**	<5	<10	<10
GW-4	2.78	2/10/2016	--	<2,000	<500	<10,000	**2,500**	**6,960**	<5	**323**	**29,000**	<5	<10	<10
	3.40	5/17/2016	<50	<2,000	**790**	**18,000**	**11,300**	**13,800**	<5	**1,230**	**76,000**	<5	<10	<10
	3.39	8/29/2016	<50	<2,000	**67,000**	<10,000	**11,400**	**19,600**	<5	**1,720**	**96,000**	<5	<10	<10
	3.28	12/2/2016	<50	<2,000	<500	<10,000	**1,940**	**7,120**	<5	**192**	**33,000**	<5	<10	<10
	2.86	2/20/2017	<50	<2,000	**580**	<10,000	**3,680**	**7,760**	<5	**399**	**46,000**	<5	<10	<10
	3.08	5/26/2017	<50	<2,000	**600**	<10,000	**8,100**	**6,000**	<5	**599**	**135,000**	<5	<10	<10
GW-11	18.52	2/9/2016	--	<2000	**740**	<10,000	**20,500**	**15,700**	<5	**971**	**130,000**	<5	<10	<10
	19.92	5/17/2016	<50	<2000	**790**	<10,000	**30,800**	**19,500**	<5	**2,670**	**90,000**	<5	<10	<10
	20.68	8/30/2016	<50	<2000	**28,000**	<10,000	**24,600**	**17,900**	<5	**3,800**	**110,000**	<5	<10	<10
	18.54	12/2/2016	<50	<2000	<500	<10,000	**13,400**	**9,340**	<5	**1,710**	**150,000**	<5	<10	<10
	18.02	2/20/2017	<50	<2000	**1,100**	<10,000	**53,800**	**14,200**	<5	**2,600**	**130,000**	<5	<10	<10
	19.18	5/24/2017	<50	<2000	**1,200**	<10,000	**41,300**	**25,400**	<5	**3,100**	**148,000**	<5	<10	<10
MTCA Method B Groundwater Cleanup Level[h]			**NVE**	**NVE**	**NVE**	**NVE**	**NVE**	**NVE**	**1,600**	**25,600**	**NVE**	**NA**	**NA**	**NA**

Notes:
All results presented in micrograms/kilogram (µg/L).

Bold	Bold results indicate that the compound was detected.
a	Analyzed by Method SM 4500-S2-D.
b	Analyzed by Method SM 5210B.
c	Analyzed by Method SM 5310B.
d	Anayzed by EPA Method 410.4.
e	Anayzed by EPA Method 300.0 unless otherwise indicated.
f	Anayzed by Method RSK 175.
g	Analyzed as Nitrate + Nitrite by EPA 353.2
h	Model Toxics Control Act (MTCA) Method B Groundwater Cleanup Level used, Cleanup Levels and Risk Calculations (CLARC) guidance.
--	Not analyzed
()	Value from re-analyzed sample after ve qualifyers were indicated during initial analysis.
NVE	No value established.
NA	Not applicable.

Qualifier:

ve	The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

Compounds:

BOD	Biochemical oxygen demand
TOC	Total organic carbon
COD	Chemical oxygen demand

Table 2
Additional Groundwater Analytical Data (µg/L)
Groundwater Monitoring and Investigation Report
Snohomish Square Cleaners
1419 Avenue D, Snohomish, Washington

Sample ID	Depth to Water (feet)	Sample Date	Metals[a]						Detected VOCs[b]					Detected VOCs[c]				
			Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Lead (unfiltered)	Manganese (filtered)	Manganese (unfiltered)	PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride
MW-1	6.68	2/9/2016	**202**	**808**	--	--	**1,990**	**2,080**	**8.9**	<1	<1	<1	<0.2	--	--	--	--	--
	8.96	5/17/2016	**1,070**	**960**	<1	<1	--	--	**4.7**	<1	<1	<1	<0.2	--	--	--	--	--
	11.17	8/30/2016	**72.2**	**263**	--	--	**1,870**	**1,960**	**18**	<1	<1	<1	<0.2	--	--	--	--	--
	6.32	12/1/2016	**385**	**1,340**	--	--	**2,190**	**2,440**	**11**	<1	<1	<1	<0.2	--	--	--	--	--
	6.18	2/21/2017	**494**	**991**	--	--	**2,650**	**2,660**	**1.4**	<1	<1	<1	<0.2	--	--	--	--	--
	7.73	5/25/2017	**1,880**	**2,740**	--	--	**3,820**	**3,490**	**2.4**	<1	<1	<1	<0.2	--	--	--	--	--
MW-2	7.67	2/9/2016	**52.8**	**213**	--	--	**3.41**	**8.09**	<1	<1	<1	<1	<0.2	--	--	--	--	--
	11.02	5/17/2016	**365**	**12,600 ve J (16,700)**	<1	**6.07**	--	--	<1	<1	<1	<1	<0.2	--	--	--	--	--
	13.31	8/29/2016	<50	**3,910**	--	--	**6.41**	**115**	<1	<1	<1	<1	<0.2	--	--	--	--	--
	7.12	12/2/2016	<50	**67.9**	--	--	**3.98**	**5.12**	<1	<1	<1	<1	<0.2	--	--	--	--	--
	6.89	2/20/2017	<50	**170**	--	--	**2.54**	**6.35**	<1	<1	<1	<1	<0.2	--	--	--	--	--
	9.39	5/30/2017	<50	**59.6**	--	--	**3.76**	**4.30**	<1	<1	<1	<1	<0.2	--	--	--	--	--
MW-3	4.49	2/9/2016	<50	**270**	--	--	**2.76**	**8.74**	**12**	<1	<1	<1	<0.2	--	--	--	--	--
	8.35	5/17/2016	**12,400 ve J (15,700)**	**16,600 ve J (26,400)**	<1	**2.51**	--	--	<1	<1	<1	<1	<0.2	--	--	--	--	--
	10.82	8/29/2016	**79,300**	**75,600**	--	--	**9,620**	**10,000**	<5	<5	<5	<5	<0.2 j	--	--	--	--	--
	4.72	12/2/2016	**10,700**	**11,700**	--	--	**2,150**	**1,410**	**2.0**	<1	<1	<1	<0.2	--	--	--	--	--
	4.09	2/21/2017	**33,900**	**37,500**	--	--	**5,000**	**5,170**	**4.2**	<1	**3.3**	<1	<0.2	--	--	--	--	--
	6.37	5/30/2017	**28,100**	**30,200**	--	--	**4,530**	**4,490**	**2.1**	<1	**9.4**	<1	<0.2	--	--	--	--	--
MW-4	4.54	2/12/2016	--	--	--	--	--	--	**26**	**1.1**	<1	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	**28**	<1	<1	<1	<0.2
	8.93	5/20/2016	--	--	--	--	--	--	**5.6**	<1	**1.3**	<1	<0.2	**1.6**	<1	<1	<1	<0.2
	10.29	8/30/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	**4.7**	<1	**0.45**
	4.58	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	**1.1**	<1	**22**	<1	**2.3**
	5.98	5/25/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	**9.8**	<1	**2.1**
MW-5	9.18	2/11/2016	--	--	--	--	--	--	**70**	**1.4**	<1	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	**50**	<1	<1	<1	<0.2
	10.89	5/19/2016	--	--	--	--	--	--	**26**	**1.2**	<1	<1	<0.2	**8.6**	**1.0**	<1	<1	<0.2
	12.06	8/30/2016	--	--	--	--	--	--	**16**	<1	<1	<1	<0.2	**9.5**	<1	<1	<1	<0.2
	8.48	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	**23**	<1	<1	<1	<0.2
	7.74	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	**44**	<1	<1	<1	<0.2
	9.36	5/25/2017	--	--	--	--	--	--	--	--	--	--	--	**51**	**1.5**	<1	<1	<0.2
MW-6	13.39	2/11/2016	--	--	--	--	--	--	<1	<1	<1	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	14.63	5/19/2016	--	--	--	--	--	--	<1	<1	<1	<1	<0.2	<1	<1	<1	<1	<0.2
	16.21	8/30/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	13.71	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	13.18	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	13.32	5/25/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
MW-7	9.82	2/9/2016	**194**	**296**	--	--	**6.49**	**10.3**	**4.8**	<1	<1	<1	<0.2	--	--	--	--	--
	11.07	5/17/2016	**196**	**9,690**	<1	**2.45**	--	--	**25**	<1	<1	<1	<0.2	--	--	--	--	--
	13.46	8/30/2016	**187**	**42,000**	--	--	**15.4**	**1,330**	**16**	<1	<1	<1	<0.2	--	--	--	--	--
	9.67	12/1/2016	**172**	**212**	--	--	**3.05**	**2.84**	**4.5**	<1	<1	<1	<0.2	--	--	--	--	--
	9.77	2/21/2017	**101**	**295**	--	--	**3.11**	**10.6**	**8.0**	<1	<1	<1	<0.2	--	--	--	--	--
	10.36	5/25/2017	**303**	**323**	--	--	**10.4**	**10.9**	**11**	<1	<1	<1	<0.2	--	--	--	--	--

Table 2
Additional Groundwater Analytical Data (µg/L)
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Snohomish Square Cleaners
1419 Avenue D, Snohomish, Washington

Sample ID	Depth to Water (feet)	Sample Date	Metals[a]						Detected VOCs[b]					Detected VOCs[c]				
			Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Lead (unfiltered)	Manganese (filtered)	Manganese (unfiltered)	PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride
MW-8	9.45	2/9/2016	**73.9**	**231**	--	--	**70.5**	**99.7**	<1	<1	<1	<1	<0.2	--	--	--	--	--
	11.03	5/17/2016	**171**	**117**	<1	<1	--	--	<1	<1	<1	<1	<0.2	--	--	--	--	--
	12.89	8/29/2016	**72.1**	**69,200**	--	--	**203**	**3,640**	<1	<1	<1	<1	<0.2	--	--	--	--	--
	9.54	12/2/2016	<50	**101**	--	--	**57.7**	**120**	<1	<1	<1	<1	<0.2	--	--	--	--	--
	9.50	2/21/2017	**55.7**	**364**	--	--	**10.1**	**52.4**	<1	<1	<1	<1	<0.2	--	--	--	--	--
	10.21	5/24/2017	<50	**324**	--	--	**13.6**	**186**	<1	<1	<1	<1	<0.2	--	--	--	--	--
MW-9	6.00	2/9/2016	<50	**2,570**	--	--	**1.27**	**55.1**	**7.9**	<1	<1	<1	<0.2	--	--	--	--	--
	9.27	5/17/2016	**78.1**	**7,120 ve J (7,990)**	<1	**2.25**	--	--	**6.5**	<1	<1	<1	<0.2	--	--	--	--	--
	11.78	8/29/2016	<50	<500	--	--	**4.57**	**13.5**	<1	<1	<1	<1	<0.2	--	--	--	--	--
	6.43	12/2/2016	<50	<50	--	--	**1.99**	**1.2**	**9.0**	<1	<1	<1	<0.2	--	--	--	--	--
	6.06	2/21/2017	<50	<50	--	--	<1	<1	**8.0**	<1	<1	<1	<0.2	--	--	--	--	--
	7.71	5/25/2017	<50	<50	--	--	<1	**1.02**	**5.4**	<1	<1	<1	<0.2	--	--	--	--	--
MW-10	4.02	2/12/2016	--	--	--	--	--	--	**38**	**2.7**	**2.4**	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	**38**	**1.8**	**1.5**	<1	<0.2
	7.56	5/19/2016	--	--	--	--	--	--	**7.0**	**73**	**5.5**	<1	<0.2	**10**	**12**	<1	<1	<0.2
	10.08	8/30/2016	--	--	--	--	--	--	--	--	--	--	--	**99 (97)**	**170 ve (170)**	**95 (97)**	**1.1** (<10)	<0.2 (<2)
	4.19	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	**75**	**85**	**62**	<1	**6.4**
	3.74	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	**5.2**	**1.2**	**15**	<1	**1.1**
	5.80	5/25/2017	--	--	--	--	--	--	--	--	--	--	--	**2.0**	**1.3**	**16**	<1	**3.2**
MW-11	5.23	2/12/2016	--	--	--	--	--	--	**48**	**2.5**	**1.2**	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	**57**	**2.2**	**1.1**	<1	<0.2
	7.55	5/19/2016	--	--	--	--	--	--	**62**	**2.8**	**1.0**	<1	<0.2	**36**	**2.4**	**<1**	<1	<0.2
	10.28	8/30/2016	--	--	--	--	--	--	<1	<1	**30**	<1	**0.7**	<1	<1	**32**	<1	**1.1**
	5.56	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	<1	**1.1**	**59**	<1	**5.7**
	5.03	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	**2.7**	**8.0**	**25**	<1	**7.4**
	6.36	5/25/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	**26**	<1	**4.1**
MW-12	9.67	2/12/2016	--	--	--	--	--	--	<1	<1	<1	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	11.09	5/19/2016	--	--	--	--	--	--	**1.7**	<1	<1	<1	<0.2	**1.7**	<1	<1	<1	<0.2
	13.34	8/30/2016	--	--	--	--	--	--	--	--	--	--	--	**3.5**	<1	<1	<1	<0.2
	9.51	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	**2.8**	<1	<1	<1	<0.2
	9.46	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	**1.2**	<1	<1	<1	<0.2
	10.05	5/25/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
MW-13	18.09	2/11/2016	--	--	--	--	--	--	**3.2**	<1	<1	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	**3.3**	<1	<1	<1	<0.2
	18.92	5/20/2016	--	--	--	--	--	--	**2.6**	<1	<1	<1	<0.2	**1.5**	<1	<1	<1	<0.2
	19.85	8/30/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	18.10	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	**2.3**	<1	<1	<1	<0.2
	18.02	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	**3.0**	<1	<1	<1	<0.2
	18.38	5/25/2017	--	--	--	--	--	--	--	--	--	--	--	**3.0**	<1	<1	<1	<0.2
MW-14	11.29	2/11/2016	--	--	--	--	--	--	<1	<1	<1	<1	<0.2	<1	<1	<1	<1	<0.2
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	11.95	5/19/2016	--	--	--	--	--	--	<1	<1	<1	<1	<0.2	<1	<1	<1	<1	<0.2
	13.34	8/30/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	11.14	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	11.24	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	11.64	5/25/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2

Table 2
Additional Groundwater Analytical Data (µg/L)
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Snohomish Square Cleaners
1419 Avenue D, Snohomish, Washington

Sample ID	Depth to Water (feet)	Sample Date	Metals[a]						Detected VOCs[b]					Detected VOCs[c]				
			Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Lead (unfiltered)	Manganese (filtered)	Manganese (unfiltered)	PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride
MW-15	8.42	5/17/2016	**78.7**	**214**	<1	<1	--	--	**140**	**2.8**	**1.1**	<1	<0.2	--	--	--	--	--
	10.42	8/30/2016	<50	**289**	--	--	**22.7**	**28.0**	**94**	**2.3**	**1.5**	<1	<0.2	--	--	--	--	--
	6.48	12/1/2016	**57.5**	**338**	--	--	**13.5**	**19**	**190 ve (180)**	**3.4**	**1.2**	<1	<0.2	--	--	--	--	--
	6.36	2/21/2017	**58.6**	**241**	--	--	**4.17**	**8.16**	**140**	**2.6**	<1	<1	<0.2	--	--	--	--	--
	7.51	5/25/2017	<50	**62.5**	--	--	**3.37**	**3.31**	**120**	**2.7**	**1.1**	<1	<0.2	--	--	--	--	--
GW-1	1.64	2/10/2016	--	--	--	--	--	--	<1	<1	<1	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	2.46	5/18/2016	--	--	--	--	--	--	<1	<1	<1	<1	<0.2	<1	<1	<1	<1	<0.2
	2.71	8/30/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	2.08	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	1.31	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	1.30	5/26/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
GW-3	3.13	2/10/2016	--	--	--	--	--	--	**1.6**	<1	<1	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	3.15	5/18/2016	--	--	--	--	--	--	**2.0**	<1	<1	<1	<0.2	**1.6**	<1	<1	<1	<0.2
	3.34	8/30/2016	--	--	--	--	--	--	--	--	--	--	--	**2.4**	<1	<1	<1	<0.2
	2.93	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	**1.2**	<1	<1	<1	<0.2
	3.02	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	3.17	5/26/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
GW-4	2.78	2/10/2016	<50	**188**	--	--	**1.42**	**133**	**4.8**	<1	<1	<1	<0.2	--	--	--	--	--
	3.40	5/17/2016	**91.7**	**3,250**	<1	<1	--	--	**9.6**	<1	<1	<1	<0.2	--	--	--	--	--
	3.39	8/29/2016	**62.8**	<500	--	--	**44.1**	**332**	**11**	<1	<1	<1	<0.2	--	--	--	--	--
	3.28	12/2/2016	<50	**50.2**	--	--	**8.51**	**279**	**5.7**	<1	<1	<1	<0.2	--	--	--	--	--
	2.86	2/20/2017	<50	**123**	--	--	**8.2**	**149**	**4.5**	<1	<1	<1	<0.2	--	--	--	--	--
	3.08	5/26/2017	<50	**73.3**	--	--	**1.81**	**118**	**4.1**	<1	<1	<1	<0.2	--	--	--	--	--
GW-5	4.60	2/10/2016	--	--	--	--	--	--	**2.5**	<1	<1	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	**2.5**	<1	<1	<1	<0.2
	5.04	5/18/2016	--	--	--	--	--	--	**3.1**	<1	<1	<1	<0.2	**1.8**	<1	<1	<1	<0.2
	5.42	8/30/2016	--	--	--	--	--	--	--	--	--	--	--	**2.9**	<1	<1	<1	<0.2
	4.07	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	**3.9**	<1	<1	<1	<0.2
	4.19	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	**2.5**	<1	<1	<1	<0.2
	4.76	5/26/2017	--	--	--	--	--	--	--	--	--	--	--	**2.3**	<1	<1	<1	<0.2
GW-6	3.92	2/10/2016	--	--	--	--	--	--	**6.4**	<1	<1	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	**6.1**	<1	<1	<1	<0.2
	4.08	5/18/2016	--	--	--	--	--	--	**6.6**	<1	<1	<1	<0.2	**5.1**	<1	<1	<1	<0.2
	4.21	8/30/2016	--	--	--	--	--	--	**7.3**	<1	<1	<1	<0.2	**7.0**	<1	<1	<1	<0.2
	3.66	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	**8.6**	<1	<1	<1	<0.2
	3.67	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	**6.0**	<1	<1	<1	<0.2
	3.95	5/26/2017	--	--	--	--	--	--	--	--	--	--	--	**5.6**	<1	<1	<1	<0.2
GW-7	2.67	2/11/2016	--	--	--	--	--	--	**1.2**	<1	<1	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	3.99	5/20/2016	--	--	--	--	--	--	**2.0**	<1	<1	<1	<0.2	**1.1**	<1	<1	<1	<0.2
	4.56	8/30/2016	--	--	--	--	--	--	--	--	--	--	--	**1.1**	<1	<1	<1	<0.2
	2.19	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	**1.1**	<1	<1	<1	<0.2
	2.11	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	3.26	5/26/2017	--	--	--	--	--	--	--	--	--	--	--	**1.0**	<1	<1	<1	<0.2

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1419 Avenue D, Snohomish, Washington

Sample ID	Depth to Water (feet)	Sample Date	Metals[a]						Detected VOCs[b]					Detected VOCs[c]				
			Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Lead (unfiltered)	Manganese (filtered)	Manganese (unfiltered)	PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	PCE	TCE	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride
GW-8	2.39	2/11/2016	--	--	--	--	--	--	**22**	<1	<1	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	**21**	<1	<1	<1	<0.2
	3.04	5/20/2016	--	--	--	--	--	--	**25**	<1	<1	<1	<0.2	**21**	<1	<1	<1	<0.2
	3.57	8/30/2016	--	--	--	--	--	--	--	--	--	--	--	**20**	<1	<1	<1	<0.2
	2.50	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	**18**	<1	<1	<1	<0.2
	2.07	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	**16**	<1	<1	<1	<0.2
	2.71	5/26/2017	--	--	--	--	--	--	--	--	--	--	--	**14**	<1	<1	<1	<0.2
GW-9	2.66	2/11/2016	--	--	--	--	--	--	<1	<1	**1.7**	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	**1.3**	<1	<0.2
	2.84	5/20/2016	--	--	--	--	--	--	<1	<1	**1.7**	<1	<0.2	<1	<1	**1.4**	<1	<0.2
	4.30	8/30/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	**1.1**	<1	<0.2
	2.34	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	4.53	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<0.2
	2.70	5/26/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	**1.1**	<1	<0.2
GW-10	21.39	2/11/2016	--	--	--	--	--	--	**19**	**1.2**	<1	<1	<0.2	--	--	--	--	--
	NA	2/29/2016	--	--	--	--	--	--	--	--	--	--	--	**27**	**1.2**	<1	<1	<0.2
	23.21	5/20/2016	--	--	--	--	--	--	**8.5**	**1.3**	<1	<1	<0.2	**5.8**	**1.1**	<1	<1	<0.2
	23.86	8/30/2016	--	--	--	--	--	--	**19**	**1.3**	**2.7**	<1	<0.2	**18**	**1.1**	<1	<1	<0.2
	20.94	12/2/2016	--	--	--	--	--	--	--	--	--	--	--	**16**	**1.3**	**1.3**	<1	<0.2
	20.89	2/21/2017	--	--	--	--	--	--	--	--	--	--	--	<1	<1	**14**	<1	<0.2
	22.07	5/25/2017	--	--	--	--	--	--	--	--	--	--	--	**1.9**	<1	**18**	<1	<0.2
GW-11	18.52	2/9/2016	**91.2**	**85.8**	--	--	**2.09**	**2.7**	**8.4**	<1	<1	<1	<0.2	--	--	--	--	--
	19.92	5/17/2016	**127**	**95**	<1	<1	--	--	**25**	<1	<1	<1	<0.2	--	--	--	--	--
	20.68	8/30/2016	**90.4**	**1,210**	--	--	**5.27**	**29.4**	**19**	<1	<1	<1	<0.2	--	--	--	--	--
	18.54	12/2/2016	<50	**77.8**	--	--	**2.31**	**2.81**	<1	<1	<1	<1	<0.2	--	--	--	--	--
	18.02	2/20/2017	**108**	**147**	--	--	**3.0**	**3.99**	**4.7**	<1	<1	<1	<0.2	--	--	--	--	--
	19.18	5/24/2017	**83.0**	**106**	--	--	**3.19**	**3.73**	**15**	<1	<1	<1	<0.2	--	--	--	--	--
MTCA Method A Groundwater Cleanup Level[d]			**11,200[e]**		**15**		**2,240[e]**		**5**	**5**	**16[e]**	**160[e]**	**0.2**	**5**	**5**	**16[e]**	**160[e]**	**0.2**

Notes:
All results presented in milligrams/kilogram (µg/L).

Bold	Bold results indicate that the compound was detected.
	Shaded cells indicate that the compound was detected at a concentration greater than the cleanup level.
a	Analyzed by EPA Method 200.8.
b	Analyzed by EPA Method 8260; sampled 2/09/16-2/11/16, 5/18/16, 12/1/16-12/2/16, 8/29/16, 2/21/17, and 5/30/17.
c	Analyzed by EPA Method 8260; sampled with passive diffusion bag (PDB).
d	Model Toxics Control Act (MTCA) Method A used, Table 720-1, WAC 173-340-900; unless otherwise noted.
e	MTCA Method B Groundwater Cleanup Level from Cleanup Levels and Risk Calculations (CLARC) guidance.
--	Not analyzed
()	Value from re-analyzed sample after ve J qualifyers were indicated during initial analysis.

Compounds:

VOCs	Volatile organic compounds
PCE	Tetrachloroethene
TCE	Trichloroethylene

Qualifiers:

j	The analyte concentration is reported below the lowest calibration standard. The value is reported as an estimate.
ve	The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
J	The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

Table 3
Field Parameters
Groundwater Monitoring and Investigation Report
Snohomish Square Cleaners
1419 Avenue D, Snohomish, Washington

Sample ID	Sample Date	Depth to Water (feet)	pH	Conductivity (mS/cm^2)	DO (mg/L)	Temperature (ºC)	ORP (mV)
MW-1	2/9/2016	6.68	6.20	0.420	2.24	12.90	190.1
	5/17/2016	8.96	6.04	0.347	1.20	14.87	114.6
	8/30/2016	11.17	5.82	0.381	1.01	18.14	257.6
	12/1/2016	6.32	6.16	0.345	0.95	16.06	84.6
	2/21/2017	6.18	6.26	0.382	0.36	11.4	110.0
	5/25/2017	7.73	6.06	0.406	0.80	14.1	57.4
MW-2	2/9/2016	7.67	5.54	0.139	9.51	12.66	326.7
	5/17/2016	11.02	5.20	0.124	7.82	13.37	263.1
	8/30/2016	13.31	5.07	0.151	2.89	15.67	258.6
	12/2/2016	7.12	5.43	0.178	7.46	12.68	77.4
	2/21/2017	6.89	5.55	0.128	9.97	8.9	231.4
	5/30/2017	9.39	5.48	0.151	8.18	12.1	157.4
MW-3	2/9/2016	4.49	5.82	0.187	6.88	10.50	305.4
	5/17/2016	8.35	5.92	0.461	0.48	14.14	6.5
	8/30/2016	10.82	5.37	0.684	1.50	17.89	46.8
	12/2/2016	4.72	6.04	0.516	3.28	11.68	-3.9
	2/20/2017	4.09	6.28	0.571	4.41	10.3	-34.1
	5/30/2017	6.37	5.81	0.488	0.22	13.9	3.1
MW-4	2/12/2016	4.54	5.85	0.129	7.15	12.80	183.3
	5/20/2016	8.93	5.66	0.397	0.49	13.79	28.8
	8/30/2016	10.29	--	--	--	--	--
	12/2/2016	NM[a]	--	--	--	--	--
	2/21/2017	4.58	--	--	--	--	--
	5/25/2017	5.98	--	--	--	--	--
MW-5	2/11/2016	9.18	5.85	0.361	0.31	12.56	303.1
	5/19/2016	10.89	5.68	0.280	1.41	12.86	198.9
	8/30/2016	12.06	5.74	0.328	0.87	16.29	145.2
	12/2/2016	8.48	--	--	--	--	--
	2/21/2017	7.74	--	--	--	--	--
	5/25/2017	9.36	--	--	--	--	--
MW-6	2/11/2016	13.39	5.81	0.424	0.40	14.58	237.1
	5/19/2016	14.63	5.57	0.366	0.51	14.25	167.4
	8/30/2016	16.21	--	--	--	--	--
	12/2/2016	13.71	--	--	--	--	--
	2/20/2017	13.18	--	--	--	--	--
	5/25/2017	13.32	--	--	--	--	--
MW-7	2/9/2016	9.82	6.37	0.987	5.65	12.49	325.6
	5/17/2016	11.07	5.57	0.725	2.2	14.96	206.3
	8/30/2016	13.46	5.54	0.974	3.09	18.41	272.8
	12/1/2016	9.67	6.13	1.207	4.37	15.8	114.7
	2/21/2017	9.77	6.37	0.760	5.53	11.0	174.9
	5/25/2017	10.36	5.81	2.460	4.53	14.5	135.8
MW-8	2/9/2016	9.45	6.02	0.185	1.69	13.55	284.7
	5/17/2016	11.03	5.65	0.209	0.44	14.30	213.2
	8/30/2016	12.89	5.87	0.250	0.91	18.00	158.8
	12/2/2016	9.54	5.90	0.160	2.80	15.08	102.8
	2/21/2017	9.50	6.06	0.153	2.96	12.7	204.9
	5/24/2017	10.21	5.92	0.160	3.71	14.1	163.7
MW-9	2/9/2016	6.00	5.87	0.108	7.03	12.88	326.5
	5/17/2016	9.27	5.46	0.097	6.77	15.22	243.0
	8/30/2016	11.78	5.34	0.108	3.90	19.05	136.0
	12/2/2016	6.43	5.77	0.111	5.42	14.94	46.0
	2/21/2017	6.06	5.88	0.105	6.79	12.0	226.3
	5/25/2017	7.71	5.75	0.103	7.82	13.9	180.9
MW-10	2/12/2016	4.02	5.88	0.125	7.79	11.56	340.2
	5/19/2016	7.56	6.08	0.238	1.76	13.31	23.8
	8/30/2016	10.08	--	--	--	--	--
	12/2/2016	4.19	--	--	--	--	--
	2/21/2017	3.74	--	--	--	--	--
	5/25/2017	5.80	--	--	--	--	--
MW-11	2/12/2016	5.23	5.89	0.133	6.40	13.62	337.7
	5/19/2016	7.55	5.71	0.248	0.34	14.02	27.7
	8/30/2016	10.28	6.09	0.663	0.45	17.63	-1.9
	12/2/2016	5.56	--	--	--	--	--
	2/20/2017	5.03	--	--	--	--	--
	5/25/2017	6.36	--	--	--	--	--
MW-12	2/12/2016	9.67	5.47	0.329	4.90	12.53	265.9
	5/19/2016	11.09	5.30	0.260	4.35	14.07	157.2
	8/30/2016	13.34	--	--	--	--	--
	12/2/2016	9.51	--	--	--	--	--
	2/20/2017	9.46	--	--	--	--	--
	5/25/2017	10.05	--	--	--	--	--

Table 3
Field Parameters
Groundwater Monitoring and Investigation Report
Snohomish Square Cleaners
1419 Avenue D, Snohomish, Washington

Sample ID	Sample Date	Depth to Water (feet)	pH	Conductivity (mS/cm^2)	DO (mg/L)	Temperature (ºC)	ORP (mV)
MW-13	2/11/2016	18.09	5.69	0.290	1.25	13.48	364.4
	5/20/2016	18.92	5.44	0.270	2.92	15.24	150.6
	8/30/2016	19.85	--	--	--	--	--
	12/2/2016	18.10	--	--	--	--	--
	2/20/2017	18.02	--	--	--	--	--
	5/25/2017	18.38	--	--	--	--	--
MW-14	2/11/2016	11.29	6.00	0.117	4.40	12.82	303.4
	5/19/2016	11.95	5.62	0.088	5.97	13.31	194.9
	8/30/2016	13.34	--	--	--	--	--
	12/2/2016	11.14	--	--	--	--	--
	2/20/2017	11.24	--	--	--	--	--
	5/25/2017	11.64	--	--	--	--	--
MW-15	5/17/2016	8.42	5.74	0.143	3.56	14.71	188.2
	8/30/2016	10.42	5.56	0.185	0.95	17.13	274.4
	12/1/2016	6.48	5.79	0.182	2.98	15.06	91.2
	2/21/2017	6.36	5.93	0.168	3.69	12.6	195.2
	5/25/2017	7.51	5.78	0.154	3.32	14.8	144.5
GW-1	2/10/2016	1.64	6.10	0.144	6.79	10.26	295.3
	5/18/2016	2.46	5.83	0.155	5.41	15.41	156.8
	8/30/2016	2.71	--	--	--	--	--
	12/2/2016	2.08	--	--	--	--	--
	2/20/2017	1.31	--	--	--	--	--
	5/26/2017	1.30	--	--	--	--	--
GW-3	2/10/2016	3.13	6.68	0.169	7.62	9.22	298.5
	5/18/2016	3.15	6.30	0.178	5.75	16.65	169.5
	8/30/2016	3.34	--	--	--	--	--
	12/2/2016	2.93	--	--	--	--	--
	2/20/2017	3.02	--	--	--	--	--
	5/26/2017	3.17	--	--	--	--	--
GW-4	2/10/2016	2.78	6.39	0.110	1.03	9.26	283.7
	5/17/2016	3.40	5.74	0.169	1.46	14.08	237.9
	8/30/2016	3.39	5.76	0.243	0.76	18.58	227.9
	12/2/2016	3.28	6.14	0.105	1.02	11.70	47.0
	2/20/2017	2.86	6.25	0.131	1.68	8.1	107.2
	5/25/2017	3.08	6.10	0.150	0.47	12.5	145.9
GW-5	2/10/2016	4.60	6.36	0.363	1.62	10.89	281.0
	5/18/2016	5.04	6.06	0.283	1.41	13.49	151.3
	8/30/2016	5.42	--	--	--	--	--
	12/2/2016	4.07	--	--	--	--	--
	2/20/2017	4.19	--	--	--	--	--
	5/26/2017	4.76	--	--	--	--	--
GW-6	2/10/2016	3.92	6.36	0.168	2.63	10.17	298.0
	5/18/2016	4.08	6.09	0.151	1.30	15.91	164.6
	8/30/2016	4.21	6.06	0.219	0.61	20.23	166.9
	12/2/2016	3.66	--	--	--	--	--
	2/20/2017	3.67	--	--	--	--	--
	5/26/2017	3.95	--	--	--	--	--
GW-7	2/11/2016	2.67	6.20	0.185	8.92	9.41	283.9
	5/20/2016	3.99	5.62	0.171	7.95	15.42	196.3
	8/30/2016	4.56	--	--	--	--	--
	12/2/2016	2.19	--	--	--	--	--
	2/20/2017	2.11	--	--	--	--	--
	5/26/2017	3.26	--	--	--	--	--
GW-8	2/11/2016	2.39	6.01	0.213	3.05	9.71	318.3
	5/20/2016	3.04	5.65	0.200	1.13	15.51	198.7
	8/30/2016	3.57	--	--	--	--	--
	12/2/2016	2.50	--	--	--	--	--
	2/20/2017	2.07	--	--	--	--	--
	5/26/2017	2.71	--	--	--	--	--
GW-9	2/11/2016	2.66	6.38	0.247	0.29	9.38	216.0
	5/20/2016	2.84	6.11	0.230	0.33	16.89	33.0
	8/30/2016	4.30	--	--	--	--	--
	12/2/2016	2.34	--	--	--	--	--
	2/20/2017	4.53	--	--	--	--	--
	5/26/2017	2.70	--	--	--	--	--
GW-10	2/11/2016	21.39	5.89	0.248	3.11	12.71	347.7
	5/20/2016	23.21	6.19	0.341	0.53	13.69	-20.2
	8/30/2016	23.86	6.15	0.440	0.69	15.97	-13.4
	12/2/2016	20.94	--	--	--	--	--
	2/20/2017	20.89	--	--	--	--	--
	5/25/2017	22.07	--	--	--	--	--

Table 3
Field Parameters
Groundwater Monitoring and Investigation Report
Snohomish Square Cleaners
1419 Avenue D, Snohomish, Washington

Sample ID	Sample Date	Depth to Water (feet)	pH	Conductivity (mS/cm^2)	DO (mg/L)	Temperature (ºC)	ORP (mV)
GW-11	2/9/2016	18.52	5.83	0.214	2.79	14.87	319.4
	5/17/2016	19.92	5.56	0.227	2.13	14.01	255.3
	8/30/2016	20.68	5.34	0.260	2.40	15.76	282.5
	12/2/2016	18.54	5.58	0.226	1.55	13.55	105.6
	2/20/2017	18.02	5.75	0.355	2.89	13.3	186.2
	5/24/2017	19.18	5.76	0.321	2.07	14.6	187.4

Notes:

a	Could not open well.
mS/cm^2	Microsiemens per square centimeter
mg/L	Milligrams per liter.
ºC	Degrees Celsius.
mV	Millivolts.
NM	Not measured.
--	Parameters were not measured at this well.

Compounds:

DO	Dissolved oxygen
ORP	Oxidation-reduction potential

Table 4
Substrate Injection Amounts
Groundwater Monitoring and Investigation Report
Snohomish Square Cleaners
1419 Avenue D, Snohomish, WA

Well	3/29/2016	3/30/2016	3/31/2016	4/5/2016	4/6/2016	4/7/2016	4/8/2016	4/12/2016	4/13/2016	2/22/2017	2/23/2017	2/24/2017	Total
IJ-1	--	--	245	--	155	--	--	--	--	--	550	--	**950** *
IJ-2	--	--	--	400	--	--	--	--	--	--	180	--	**580** *
IJ-3	--	--	--	175	225	--	--	--	--	--	625	--	**1,025** *
IJ-4	--	--	--	400	--	--	--	--	--	105	295	--	**800** *
IJ-5	--	--	400	--	--	--	--	--	--	400	--	--	**800**
IJ-6	--	--	400	--	--	--	--	--	--	400	--	--	**800**
IJ-7	--	--	400	--	--	--	--	--	--	195	--	--	**595**
IJ-8	--	--	--	--	400	--	--	--	--	--	--	550	**950**
IJ-9	--	35	30	--	--	--	120	90	100	--	--	--	**375**
IJ-10	--	--	--	--	--	--	25	85	90	--	--	--	**200** *
IJ-11	--	375	--	--	--	--	--	--	--	--	--	--	**375** *
IJ-12	40	335	--	--	--	--	--	--	--	--	--	--	**375**
MW-3	--	--	--	--	--	140	100	--	--	--	--	--	**240** *
MW-4	--	--	--	--	--	--	230	150	--	--	--	--	**380**
GW-10	--	--	--	165	235	--	--	--	--	--	--	--	**400**
MW-11	--	--	--	--	--	--	375	--	--	--	--	--	**375**
EIW-E	--	--	--	--	--	1,080	--	--	--	--	--	--	**1,080**
EIW-W	--	--	--	--	650	430	--	--	--	--	--	--	**1,080**
												Total Injected Amount:	**11,380**

Notes:
Injection amounts in gallons.
Method: Pressurized injection using injection pump.
* Part of injection was gravity fed.
-- No injection at this well.

Table 5
Survey and Depth to Groundwater Data
Groundwater Monitoring and Investigation Report
Snohomish Square Cleaners
1419 Avenue D, Snohomish, Washington

Monitoring Well ID	Top of Casing Elevation[a] (feet)	Depth to Groundwater[b] (ft below TOC)	Groundwater Elevation (feet)
GW-1	144.8	2.48	142.32
GW-2	144.99	NM	NM
GW-3	144.34	3.28	141.06
GW-4	144.24	3.25	140.99
GW-5	144.78	5.20	139.58
GW-6	144.78	4.11	140.67
GW-7	147.53	4.18	143.35
GW-8	146.30	3.30	143.00
GW-9	146.37	3.44	142.93
GW-10	168.38	22.82	145.56
GW-11	164.24	20.22	144.02
MW-1	162.20	9.62	152.58
MW-2	164.41	11.68	152.73
MW-3	161.57	9.05	152.52
MW-4	161.09	8.15	152.94
MW-5	169.51	10.98	158.53
MW-6	165.61	14.76	150.85
MW-7	163.64	11.41	152.23
MW-8	163.75	11.43	152.32
MW-9	163	9.90	153.10
MW-10*	161.18	8.29	152.89
MW-11*	160.85	8.19	152.66
MW-12*	163.34	11.61	151.73
MW-13*	167.24	19.19	148.05
MW-14*	163.83	12.20	151.63
MW-15*	161.30	8.96	152.34
MW-16*	167.67	14.96	152.71
MW-17*	166.24	17.89	148.35
MW-18*	166.14	18.54	147.60

Notes:

All results presented in feet using North American Vertical Datum 1988 (NAVD88).

Survey data provided from *Remedial Investigation and Focused Feasibility Study, Snohomish County Shop Upper Terrace, 1200 Block of Avenue D, Snohomish, Washington.*

* Pace Survey 7/11/17.

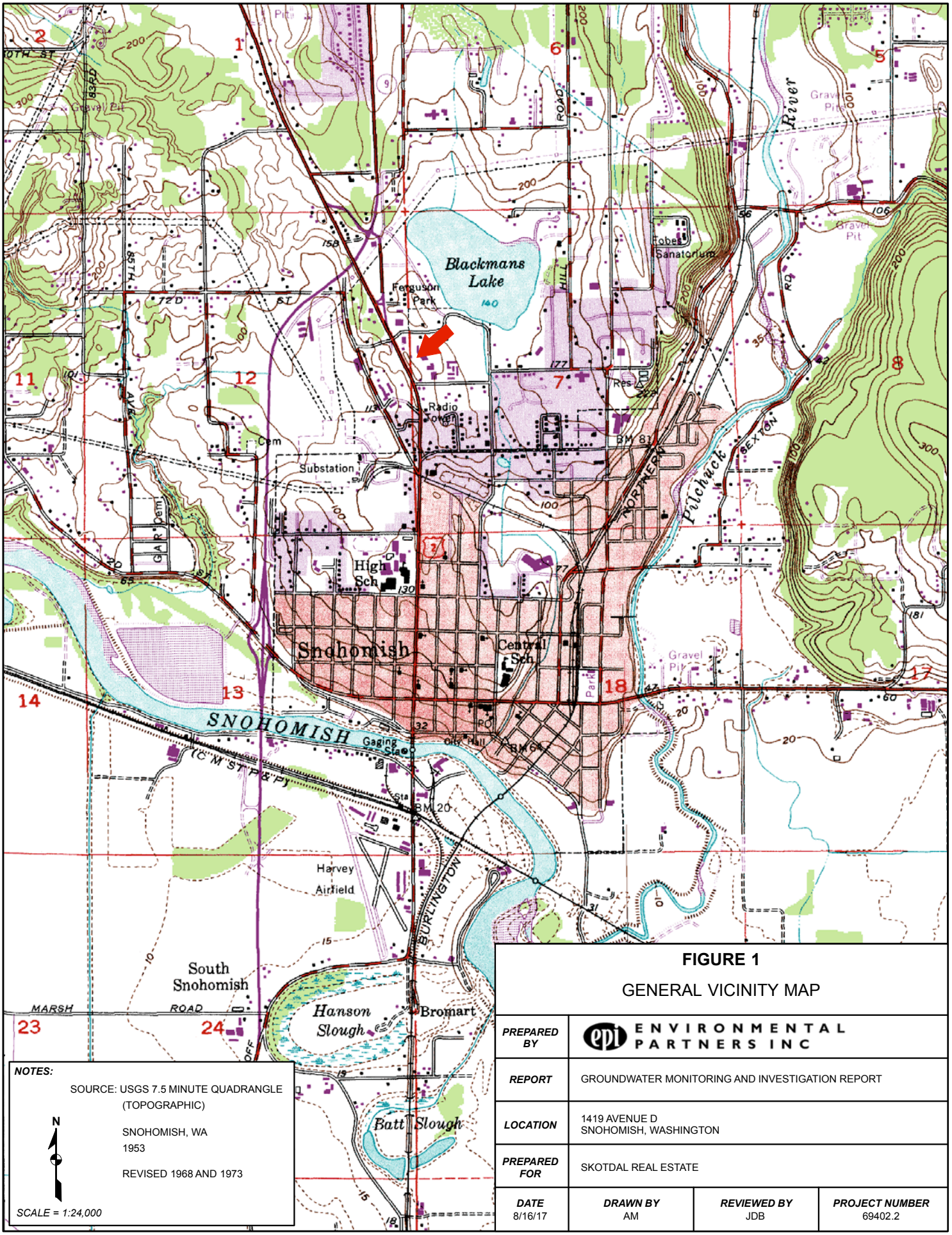
a Surveyed by Snohomish County surveyors using State Plane Coordinate System. Benchmark for survey: brass plug in concrete on west side of Bickford Rd at SE corner of building. Snohomish County Point ID#248 Designation #5501. NAVD88, Elevation = 136.31'.

b Depth to water measured by EPI on July 11, 2017.

TOC Top of casing.

NM Not measured.

Figures



NOTES:

SOURCE: USGS 7.5 MINUTE QUADRANGLE (TOPOGRAPHIC)

SNOHOMISH, WA
1953

REVISED 1968 AND 1973

N

SCALE = 1:24,000

FIGURE 1

GENERAL VICINITY MAP

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT		
LOCATION	1419 AVENUE D SNOHOMISH, WASHINGTON		
PREPARED FOR	SKOTDAL REAL ESTATE		
DATE 8/16/17	***DRAWN BY*** AM	***REVIEWED BY*** JDB	***PROJECT NUMBER*** 69402.2

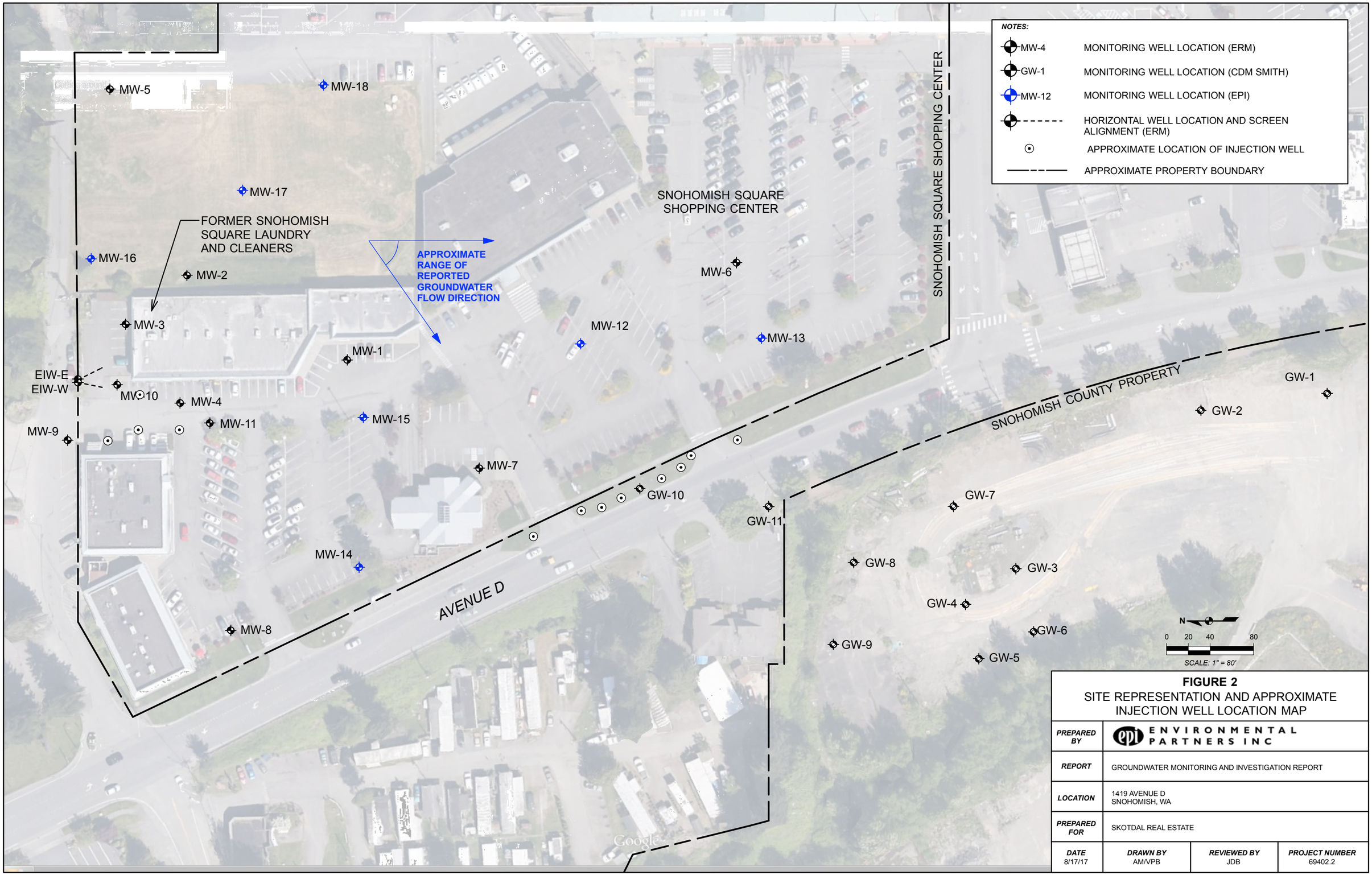
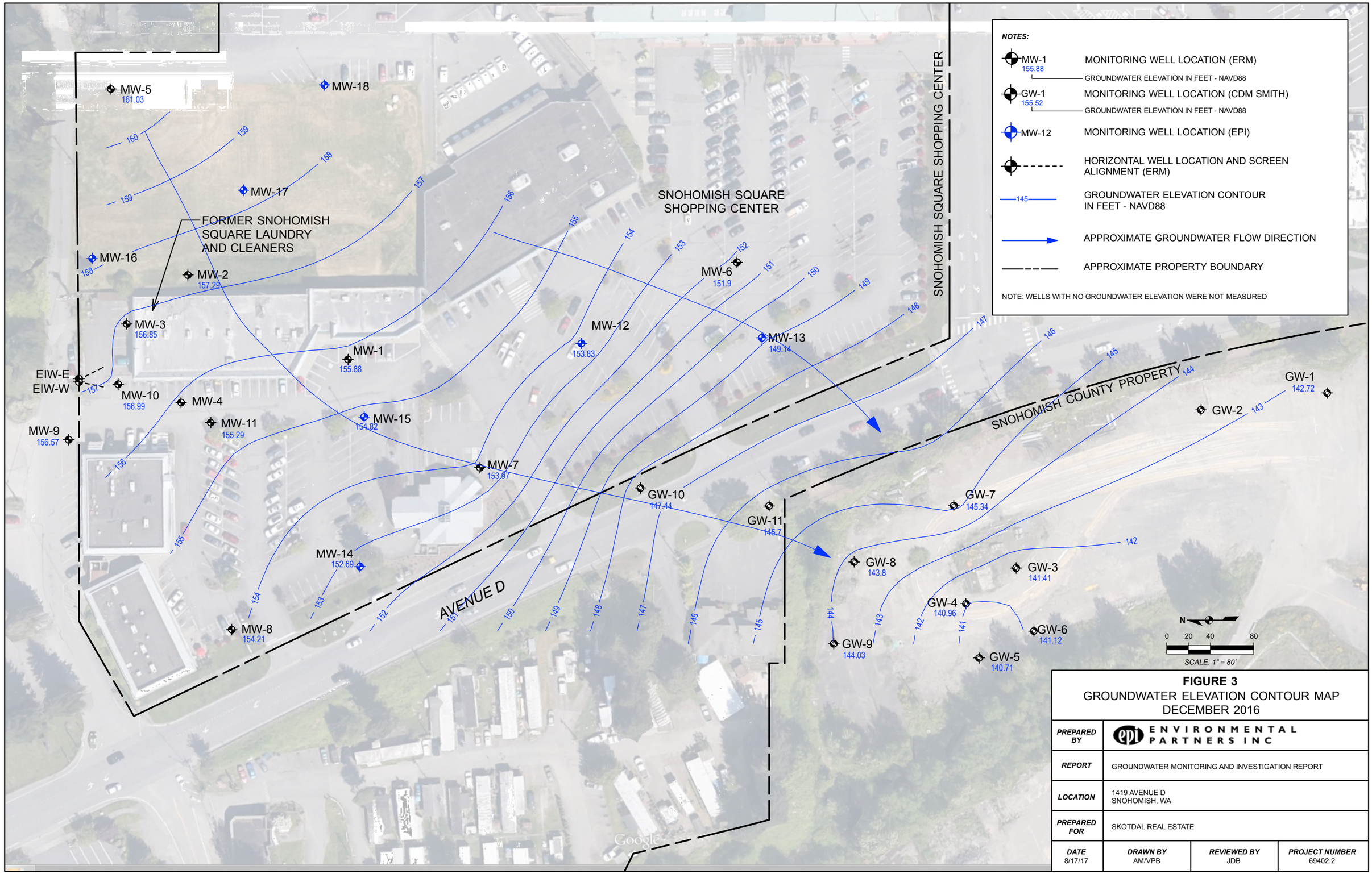


FIGURE 2
SITE REPRESENTATION AND APPROXIMATE INJECTION WELL LOCATION MAP

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT		
LOCATION	1419 AVENUE D SNOHOMISH, WA		
PREPARED FOR	SKOTDAL REAL ESTATE		
DATE 8/17/17	DRAWN BY AM/VPB	REVIEWED BY JDB	PROJECT NUMBER 69402.2



NOTES:

MW-1 155.88 — MONITORING WELL LOCATION (ERM); GROUNDWATER ELEVATION IN FEET - NAVD88

GW-1 155.52 — MONITORING WELL LOCATION (CDM SMITH); GROUNDWATER ELEVATION IN FEET - NAVD88

MW-12 — MONITORING WELL LOCATION (EPI)

HORIZONTAL WELL LOCATION AND SCREEN ALIGNMENT (ERM)

145 — GROUNDWATER ELEVATION CONTOUR IN FEET - NAVD88

APPROXIMATE GROUNDWATER FLOW DIRECTION

APPROXIMATE PROPERTY BOUNDARY

NOTE: WELLS WITH NO GROUNDWATER ELEVATION WERE NOT MEASURED

N

0 20 40 80

SCALE: 1" = 80'

FIGURE 3
GROUNDWATER ELEVATION CONTOUR MAP
DECEMBER 2016

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT		
LOCATION	1419 AVENUE D SNOHOMISH, WA		
PREPARED FOR	SKOTDAL REAL ESTATE		
DATE 8/17/17	**DRAWN BY** AM/VPB	**REVIEWED BY** JDB	**PROJECT NUMBER** 69402.2

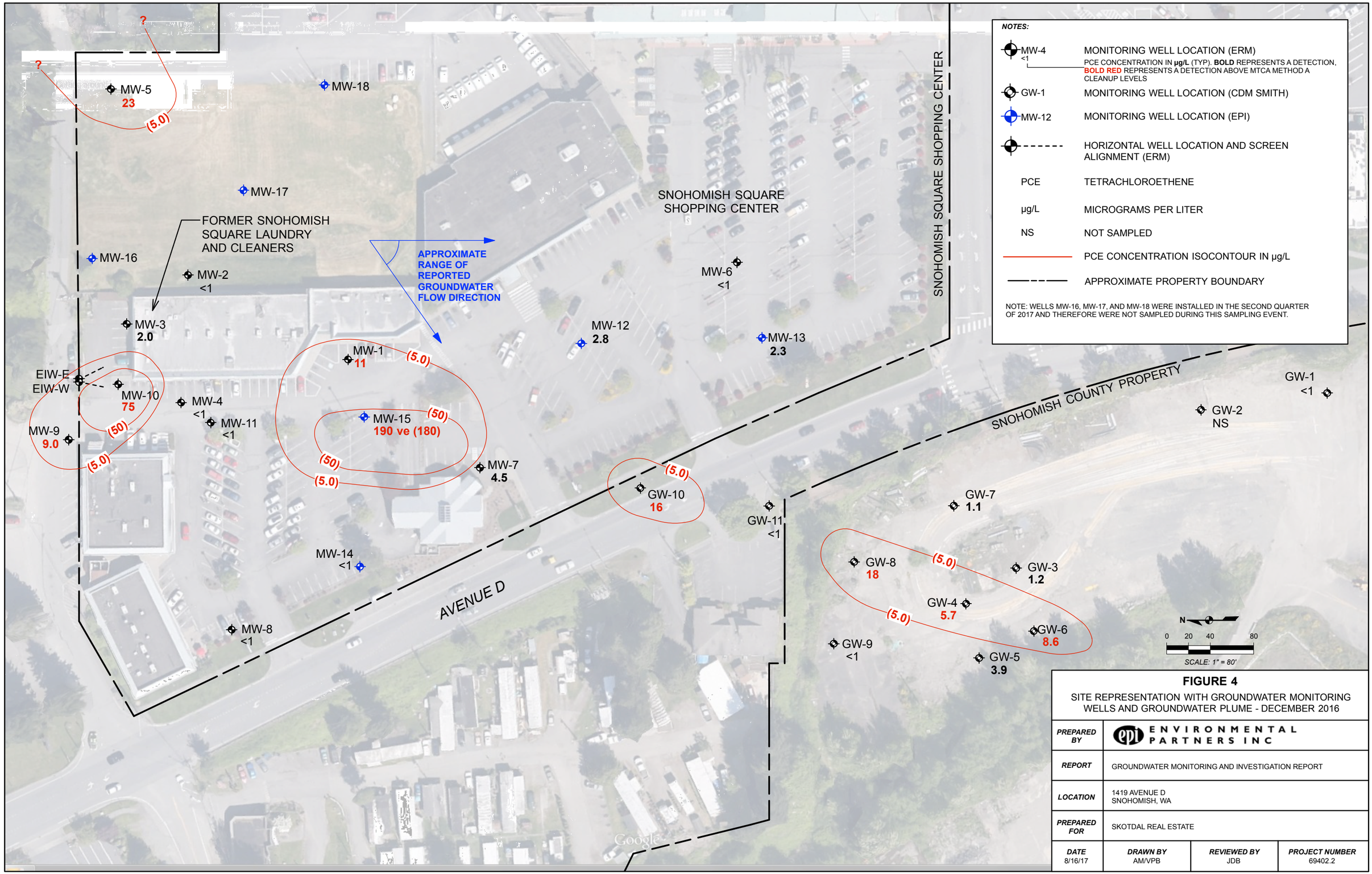


FIGURE 4

SITE REPRESENTATION WITH GROUNDWATER MONITORING WELLS AND GROUNDWATER PLUME - DECEMBER 2016

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT		
LOCATION	1419 AVENUE D SNOHOMISH, WA		
PREPARED FOR	SKOTDAL REAL ESTATE		
DATE 8/16/17	***DRAWN BY*** AM/VPB	***REVIEWED BY*** JDB	***PROJECT NUMBER*** 69402.2

NOTES:

MW-1 155.88 — MONITORING WELL LOCATION (ERM)
GROUNDWATER ELEVATION IN FEET - NAVD88

GW-1 155.52 — MONITORING WELL LOCATION (CDM SMITH)
GROUNDWATER ELEVATION IN FEET - NAVD88

MW-12 — MONITORING WELL LOCATION (EPI)

HORIZONTAL WELL LOCATION AND SCREEN ALIGNMENT (ERM)

145 — GROUNDWATER ELEVATION CONTOUR IN FEET - NAVD88

APPROXIMATE GROUNDWATER FLOW DIRECTION

APPROXIMATE PROPERTY BOUNDARY

NOTE: WELLS WITH NO GROUNDWATER ELEVATION WERE NOT MEASURED

MW-5 161.77
MW-18
MW-17
MW-16
MW-2 157.52
MW-3 157.48
MW-1 156.02
EIW-E
EIW-W
MW-10 157.44
MW-4 156.51
MW-11 155.82
MW-9 156.94
MW-15 154.94
MW-7 153.87
MW-14 152.59
MW-8 154.25
MW-12 153.88
MW-6 152.43
MW-13 149.22
GW-10 147.49
GW-11 146.22
GW-9 141.84
GW-8 144.23
GW-7 145.42
GW-3 141.32
GW-4 141.38
GW-6 141.11
GW-5 140.59
GW-2
GW-1 143.49

FORMER SNOHOMISH SQUARE LAUNDRY AND CLEANERS

SNOHOMISH SQUARE SHOPPING CENTER

SNOHOMISH COUNTY PROPERTY

AVENUE D

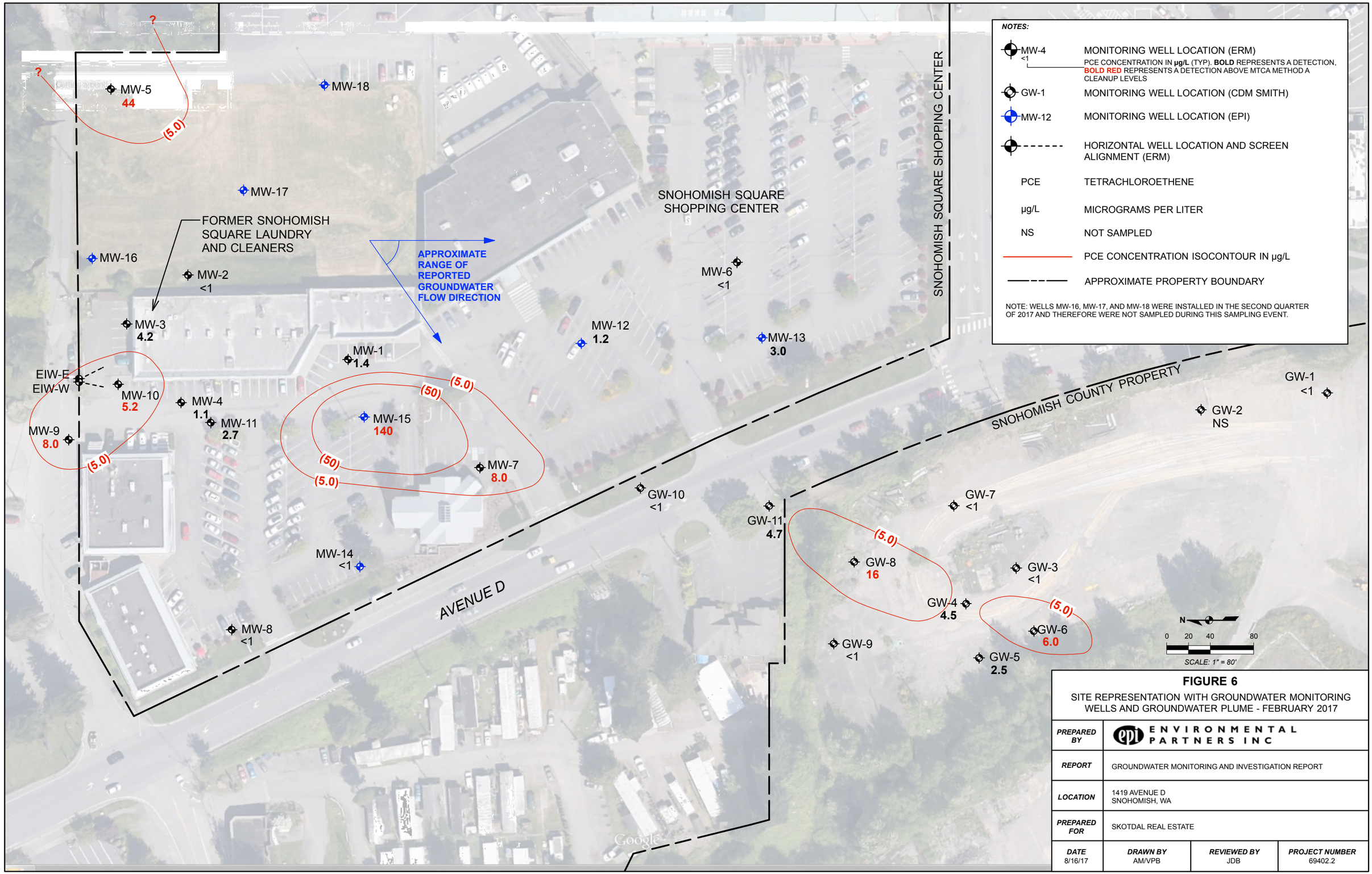
N

0 20 40 80

SCALE: 1" = 80'

FIGURE 5
GROUNDWATER ELEVATION CONTOUR MAP
FEBRUARY 2017

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT		
LOCATION	1419 AVENUE D SNOHOMISH, WA		
PREPARED FOR	SKOTDAL REAL ESTATE		
DATE 8/17/17	DRAWN BY AM/VPB	REVIEWED BY JDB	PROJECT NUMBER 69402.2



NOTES:

- MW-4 / <1 — MONITORING WELL LOCATION (ERM). PCE CONCENTRATION IN **µg/L** (TYP). **BOLD** REPRESENTS A DETECTION, **BOLD RED** REPRESENTS A DETECTION ABOVE MTCA METHOD A CLEANUP LEVELS
- GW-1 — MONITORING WELL LOCATION (CDM SMITH)
- MW-12 — MONITORING WELL LOCATION (EPI)
- HORIZONTAL WELL LOCATION AND SCREEN ALIGNMENT (ERM)
- PCE — TETRACHLOROETHENE
- µg/L — MICROGRAMS PER LITER
- NS — NOT SAMPLED
- PCE CONCENTRATION ISOCONTOUR IN µg/L
- APPROXIMATE PROPERTY BOUNDARY

NOTE: WELLS MW-16, MW-17, AND MW-18 WERE INSTALLED IN THE SECOND QUARTER OF 2017 AND THEREFORE WERE NOT SAMPLED DURING THIS SAMPLING EVENT.

FIGURE 6

SITE REPRESENTATION WITH GROUNDWATER MONITORING WELLS AND GROUNDWATER PLUME - FEBRUARY 2017

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT		
LOCATION	1419 AVENUE D SNOHOMISH, WA		
PREPARED FOR	SKOTDAL REAL ESTATE		
DATE 8/16/17	***DRAWN BY*** AM/VPB	***REVIEWED BY*** JDB	***PROJECT NUMBER*** 69402.2

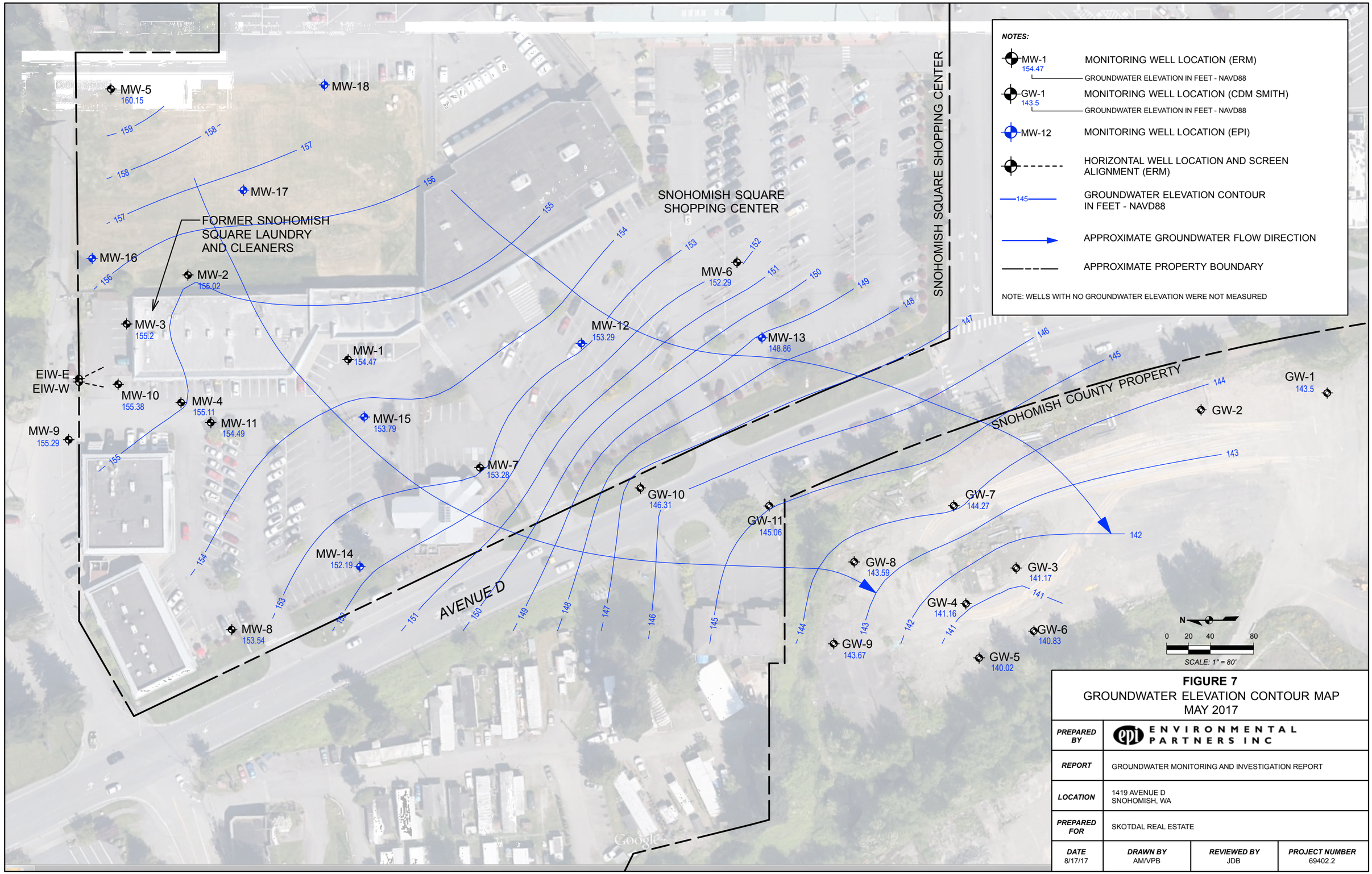
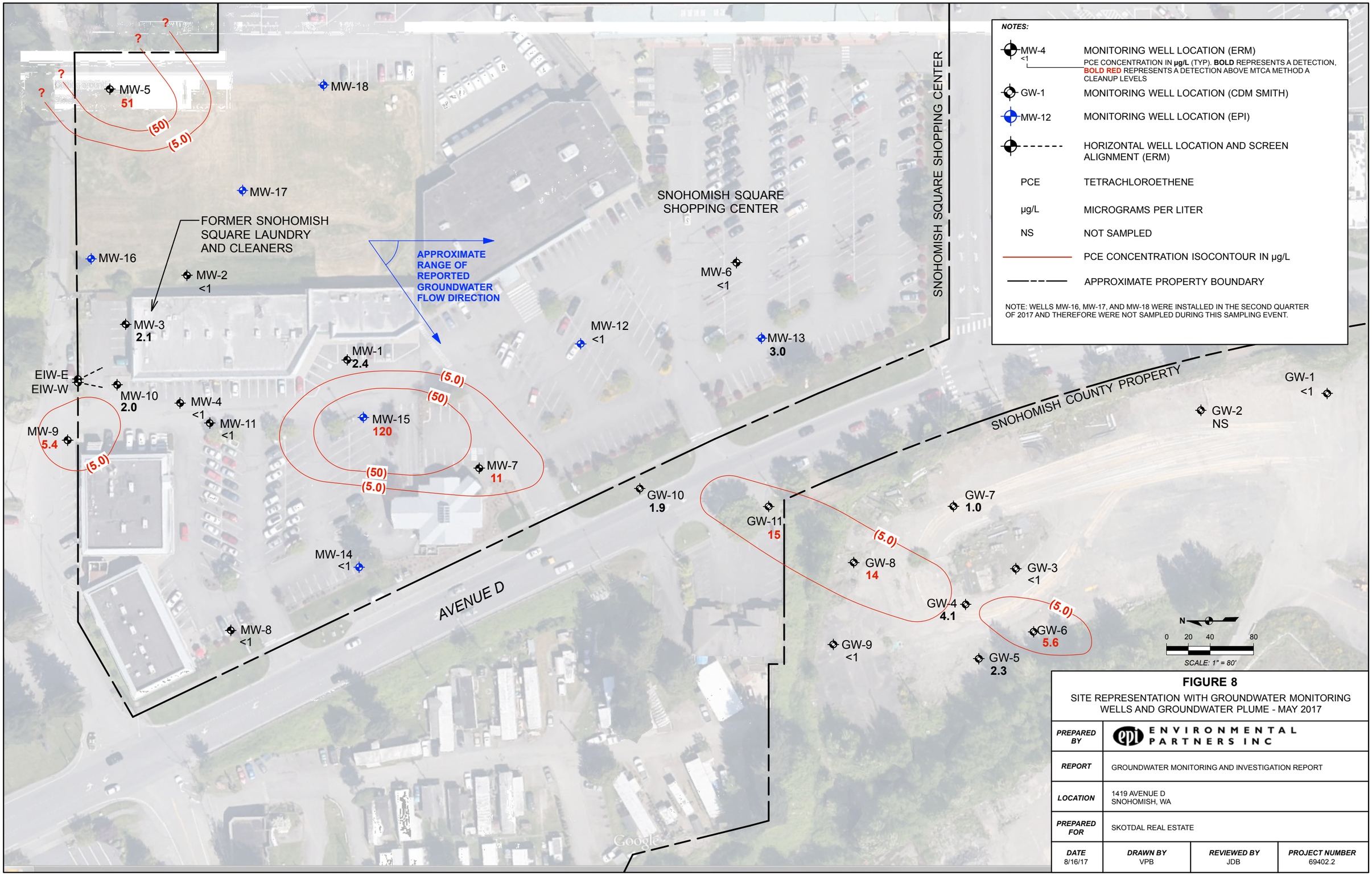


FIGURE 7
GROUNDWATER ELEVATION CONTOUR MAP
MAY 2017

PREPARED BY	epi ENVIRONMENTAL PARTNERS INC		
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT		
LOCATION	1419 AVENUE D SNOHOMISH, WA		
PREPARED FOR	SKOTDAL REAL ESTATE		
DATE 8/17/17	***DRAWN BY*** AM/VPB	***REVIEWED BY*** JDB	***PROJECT NUMBER*** 69402.2



NOTES:

- MW-4 <1 — MONITORING WELL LOCATION (ERM)
  PCE CONCENTRATION IN **µg/L** (TYP). **BOLD** REPRESENTS A DETECTION, **BOLD RED** REPRESENTS A DETECTION ABOVE MTCA METHOD A CLEANUP LEVELS
- GW-1 — MONITORING WELL LOCATION (CDM SMITH)
- MW-12 — MONITORING WELL LOCATION (EPI)
- HORIZONTAL WELL LOCATION AND SCREEN ALIGNMENT (ERM)
- PCE — TETRACHLOROETHENE
- µg/L — MICROGRAMS PER LITER
- NS — NOT SAMPLED
- PCE CONCENTRATION ISOCONTOUR IN µg/L
- APPROXIMATE PROPERTY BOUNDARY

NOTE: WELLS MW-16, MW-17, AND MW-18 WERE INSTALLED IN THE SECOND QUARTER OF 2017 AND THEREFORE WERE NOT SAMPLED DURING THIS SAMPLING EVENT.

FIGURE 8

SITE REPRESENTATION WITH GROUNDWATER MONITORING WELLS AND GROUNDWATER PLUME - MAY 2017

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT		
LOCATION	1419 AVENUE D SNOHOMISH, WA		
PREPARED FOR	SKOTDAL REAL ESTATE		
DATE 8/16/17	***DRAWN BY*** VPB	***REVIEWED BY*** JDB	***PROJECT NUMBER*** 69402.2

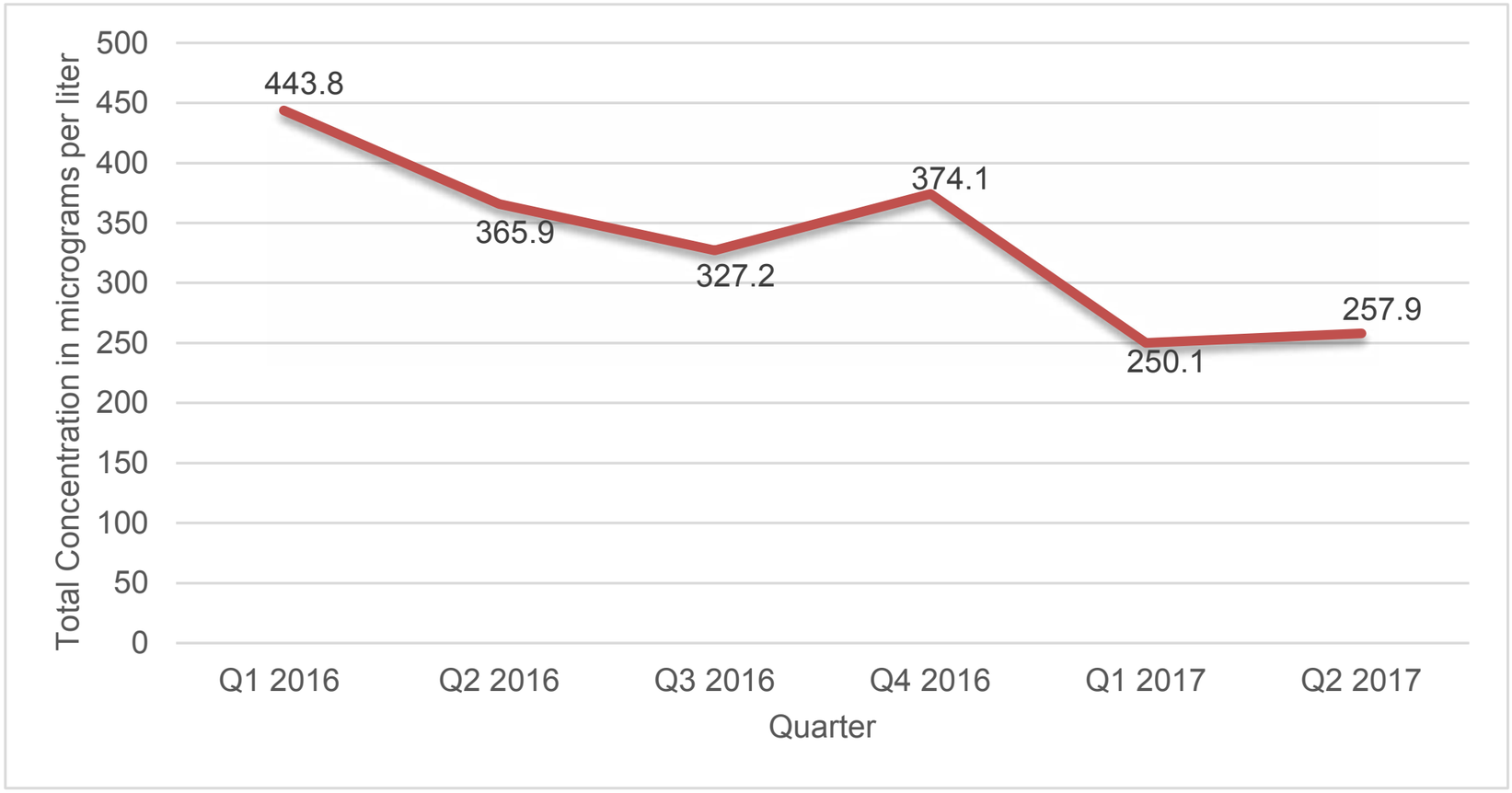


FIGURE 9

PCE CONCENTRATION VERSUS TIME

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT		
LOCATION	1419 AVENUE D SNOHOMISH, WA		
PREPARED FOR	SKOTDAL REAL ESTATE		
DATE 8/3/17	***DRAWN BY*** VPB	***REVIEWED BY*** JDB	***PROJECT NUMBER*** 69402.2

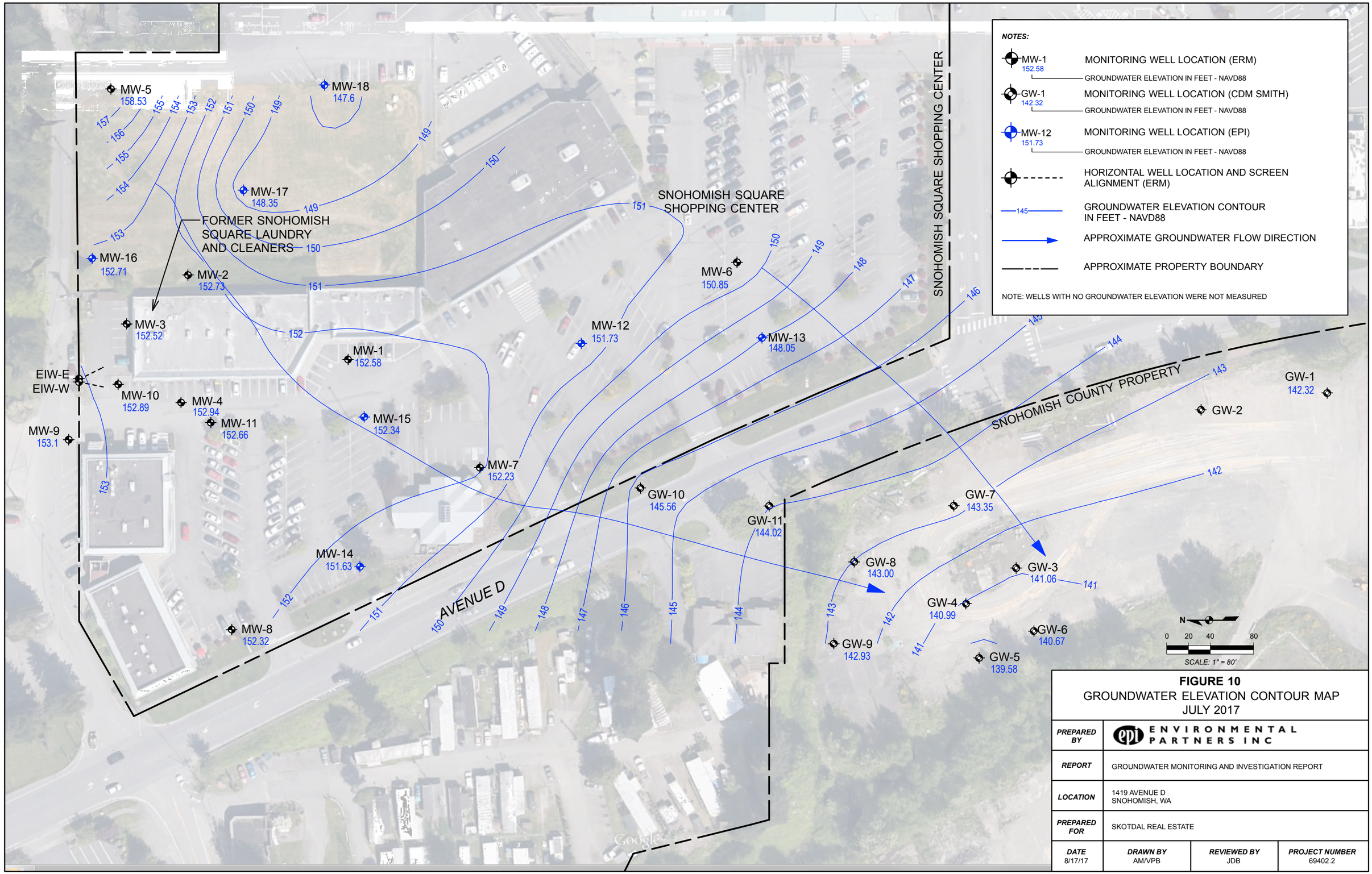


FIGURE 10
GROUNDWATER ELEVATION CONTOUR MAP
JULY 2017

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT		
LOCATION	1419 AVENUE D SNOHOMISH, WA		
PREPARED FOR	SKOTDAL REAL ESTATE		
DATE 8/17/17	***DRAWN BY*** AM/VPB	***REVIEWED BY*** JDB	***PROJECT NUMBER*** 69402.2

NOTES:

- MW-1 152.58 — MONITORING WELL LOCATION (ERM); GROUNDWATER ELEVATION IN FEET - NAVD88
- GW-1 142.32 — MONITORING WELL LOCATION (CDM SMITH); GROUNDWATER ELEVATION IN FEET - NAVD88
- MW-12 151.73 — MONITORING WELL LOCATION (EPI); GROUNDWATER ELEVATION IN FEET - NAVD88
- HORIZONTAL WELL LOCATION AND SCREEN ALIGNMENT (ERM)
- 145 — GROUNDWATER ELEVATION CONTOUR IN FEET - NAVD88
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- APPROXIMATE PROPERTY BOUNDARY

NOTE: WELLS WITH NO GROUNDWATER ELEVATION WERE NOT MEASURED

MW-5 158.12
MW-18 146.94
MW-17 147.7
MW-16 151.95
MW-2 151.76
MW-3 151.44
MW-1 151.66
EIW-E
EIW-W
MW-10 151.77
MW-4 152.85
MW-11 151.72
MW-9
MW-15 148.8
MW-7 151.47
MW-14 151.05
MW-8 151.46
MW-6
MW-12 147.79
MW-13 147.58
GW-10 144.43
GW-11 143.66
GW-9 142.15
GW-8 142.75
GW-7 143.00
GW-3 140.93
GW-4 140.84
GW-6 140.53
GW-5 139.34
GW-2
GW-1 141.97

FORMER SNOHOMISH SQUARE LAUNDRY AND CLEANERS
SNOHOMISH SQUARE SHOPPING CENTER
SNOHOMISH COUNTY PROPERTY
AVENUE D

N
0 20 40 80
SCALE: 1" = 80'

FIGURE 11
GROUNDWATER ELEVATION CONTOUR MAP
AUGUST 2017

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	GROUNDWATER MONITORING AND INVESTIGATION REPORT		
LOCATION	1419 AVENUE D SNOHOMISH, WA		
PREPARED FOR	SKOTDAL REAL ESTATE		
DATE 8/17/17	DRAWN BY AM/VPB	REVIEWED BY JDB	PROJECT NUMBER 69402.2

Attachment A
Laboratory Analytical Results

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
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www.friedmanandbruya.com

March 14, 2017

Josh Bernthal, Project Manager
Environmental Partners, Inc.
1180 NW Maple St, Suite 310
Issaquah, WA 98027

RE: 69402, F&BI 702293

Dear Mr Bernthal:

Included are the results from the testing of material submitted on February 21, 2017 from the 69402, F&BI 702293 project. There are 27 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Cynthia Moon
EPI0314R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 21, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 702293 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
702293 -01	GW-4
702293 -02	GW-11
702293 -03	MW-2
702293 -04	MW-3

The samples were sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the samples were sent to ALS-Simi for carbon dioxide analysis. ALS-Simi received HCl preserved VOAs for GW-11, MW-2, and MW-3 which will bias CO2 concentrations high. Therefore unpreserved VOAs were sent to ALS for GW-11 and MW-3. There were no unpreserved VOAs available for MW-2. The results of GW-11 and MW-3 carbon dioxide testing will be forwarded to your office upon completion. The available results from Amtest and ALS are included.

All quality control requirements were acceptable.

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	GW-4	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/23/17	Lab ID:	702293-01
Date Analyzed:	02/23/17	Data File:	702293-01.073
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	8.20

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	GW-11	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/23/17	Lab ID:	702293-02
Date Analyzed:	02/23/17	Data File:	702293-02.074
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	108
Manganese	3.00

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-2	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/23/17	Lab ID:	702293-03
Date Analyzed:	02/23/17	Data File:	702293-03.075
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	2.54

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-3	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/23/17	Lab ID:	702293-04 x10
Date Analyzed:	02/23/17	Data File:	702293-04 x10.076
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	33,900
Manganese	5,000

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702293
Date Extracted:	02/23/17	Lab ID:	I7-091 mb
Date Analyzed:	02/23/17	Data File:	I7-091 mb.062
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	GW-4	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	702293-01
Date Analyzed:	02/21/17	Data File:	702293-01.034
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	123
Manganese	149

Analysis For Total Metals By EPA Method 200.8

Client ID:	GW-11	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	702293-02
Date Analyzed:	02/21/17	Data File:	702293-02.037
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	147
Manganese	3.99

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-2	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	702293-03
Date Analyzed:	02/21/17	Data File:	702293-03.040
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	170
Manganese	6.35

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-3	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	702293-04 x10
Date Analyzed:	02/21/17	Data File:	702293-04 x10.045
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	37,500
Manganese	5,170

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	I7-088 mb
Date Analyzed:	02/21/17	Data File:	I7-088 mb.026
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-4	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/23/17	Lab ID:	702293-01
Date Analyzed:	02/23/17	Data File:	022329.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	4.5

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-11	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/23/17	Lab ID:	702293-02
Date Analyzed:	02/23/17	Data File:	022330.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	4.7

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-2	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/23/17	Lab ID:	702293-03
Date Analyzed:	02/23/17	Data File:	022331.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-3	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/23/17	Lab ID:	702293-04
Date Analyzed:	02/23/17	Data File:	022332.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	3.3
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	4.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702293
Date Extracted:	02/23/17	Lab ID:	07-0349 mb
Date Analyzed:	02/23/17	Data File:	022308.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	GW-4	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	702293-01
Date Analyzed:	02/21/17	Data File:	006F0601.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	GW-11	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	702293-02
Date Analyzed:	02/21/17	Data File:	007F0701.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-2	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	702293-03
Date Analyzed:	02/21/17	Data File:	008F0801.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-3	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	702293-04
Date Analyzed:	02/21/17	Data File:	009F0901.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	6,100 ve
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-3	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	702293-04 1/100
Date Analyzed:	03/06/17	Data File:	006F0601.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	8,000
Ethane	<1,000
Ethene	<1,000

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702293
Date Extracted:	02/21/17	Lab ID:	07-0345 mb
Date Analyzed:	02/21/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Date of Report: 03/14/17
Date Received: 02/21/17
Project: 69402, F&BI 702293

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 702356-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	97.4	99	86	70-130	14
Manganese	ug/L (ppb)	20	134	141 b	120 b	70-130	16 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	90	85-115
Manganese	ug/L (ppb)	20	90	85-115

Date of Report: 03/14/17
Date Received: 02/21/17
Project: 69402, F&BI 702293

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 702292-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	141	103	97	70-130	6
Manganese	ug/L (ppb)	20	97.0	126	107	70-130	16

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	105	85-115
Manganese	ug/L (ppb)	20	100	85-115

Date of Report: 03/14/17
Date Received: 02/21/17
Project: 69402, F&BI 702293

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 702321-12 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	<0.2	101	36-166
Chloroethane	ug/L (ppb)	50	<1	114	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	104	60-136
Methylene chloride	ug/L (ppb)	50	<5	94	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	100	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	100	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	99	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	97	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	101	60-146
Trichloroethene	ug/L (ppb)	50	<1	94	66-135
Tetrachloroethene	ug/L (ppb)	50	<1	95	10-226

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	106	102	50-154	4
Chloroethane	ug/L (ppb)	50	116	102	58-146	13
1,1-Dichloroethene	ug/L (ppb)	50	107	103	67-136	4
Methylene chloride	ug/L (ppb)	50	104	97	39-148	7
trans-1,2-Dichloroethene	ug/L (ppb)	50	103	99	68-128	4
1,1-Dichloroethane	ug/L (ppb)	50	103	99	79-121	4
cis-1,2-Dichloroethene	ug/L (ppb)	50	105	99	80-123	6
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	100	95	73-132	5
1,1,1-Trichloroethane	ug/L (ppb)	50	106	100	83-130	6
Trichloroethene	ug/L (ppb)	50	98	93	80-120	5
Tetrachloroethene	ug/L (ppb)	50	102	96	76-121	6

Date of Report: 03/14/17
Date Received: 02/21/17
Project: 69402, F&BI 702293

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Laboratory Code: 702293-04 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methane	ug/L (ppb)	6,100 ve	6,400 ve	nm
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methane	ug/L (ppb)	59	81	76	50-150	7
Ethane	ug/L (ppb)	110	72	68	50-150	6
Ethene	ug/L (ppb)	102	99	93	50-150	7

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

2655 Park Center Dr., Suite A
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www.alsglobal.com

LABORATORY REPORT

March 8, 2017

Mike Erdahl
Friedman & Bruya, Inc.
3012 16th Ave. W.
Seattle, WA 98119

RE: 702293

Dear Mike:

Enclosed are the results of the sample submitted to our laboratory on February 23, 2017. For your reference, this analysis has been assigned our service request number P1700898.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Sue Anderson at 12:15 pm, Mar 08, 2017
Sue Anderson
Project Manager

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
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F: +1 805 526 7270
www.alsglobal.com

Client: Friedman & Bruya, Inc.
Project: 702293

Service Request No: P1700898

CASE NARRATIVE

The sample was received intact under chain of custody on February 23, 2017 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

The analysis for samples GW-11 (P1700898-002), MW-2 (P1700898-003) and MW-3 (P1700898-004) were cancelled because the submitted voa vials were acidified.

Carbon Dioxide Analysis

The sample was analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. The sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gas (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

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www.alsglobal.com

ALS Environmental - Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1177034
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-004
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-16-7
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA016272016-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Friedman & Bruya, Inc.
Project ID: 702293

Service Request: P1700898

Date Received: 2/23/2017
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2
GW-4	P1700898-001	Water	2/20/2017	10:32	X

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

P1700810

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER ALS - Simi Valley

PROJECT NAME/NO.	PO #
702293	E-506

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	CO_2			Notes
GW-4	1	2/20/17	1032	water									X			
GW-11	2	"	1125	"									X			
MW-2	3	"	1240	"									X			
MW-3	4	"	1515	"									X			

5 of 8

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman and Bruya	2/22/17	1130
Received by:					
Relinquished by:					
Received by:		2/23/17	0930 3°C		

ALS Environmental
Sample Acceptance Check Form

Client: Friedman & Bruya, Inc. Work order: P1700898

Project: 702293

Sample(s) received on: 2/23/17 Date opened: 2/23/17 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: 3° C Blank Temperature: ° C **Gel Packs**			
8	Were **custody seals** on outside of cooler/Box/Container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☒	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1700898-001.01	40mL VOA NP		7		A	MC 3/02/2017
P1700898-001.02	40mL VOA NP				A	
P1700898-002.01	40ml VOA HCL				A	
P1700898-002.02	40ml VOA HCL		1		A	MC 3/02/2017
P1700898-003.01	40ml VOA HCL				A	
P1700898-003.02	40ml VOA HCL		1		A	MC 3/02/2017
P1700898-004.01	40ml VOA HCL				A	
P1700898-004.02	40ml VOA HCL		1		A	MC 3/02/2017

Explain any discrepancies: (include lab sample ID numbers):

Samples -002 thru -004 could not be analyzed because they were acidified.

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Friedman & Bruya, Inc.**
Client Project ID: 702293

ALS Project ID: P1700898

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst:. Mike Conejo
Matrix: Water
Test Notes:

Date(s) Collected: 2/20/17
Date Received: 2/23/17
Date Analyzed: 3/2/17

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	MRL µg/L	Data Qualifier
GW-4	P1700898-001	0.10	**46,000**	1,000	
Method Control Sample	P170302-MB	0.10	ND	1,000	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **Friedman & Bruya, Inc.**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **702293**

ALS Project ID: P1700898
ALS Sample ID: P170302-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 3/02/17
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result$_1$ LCS ug/L	Result$_1$ DLCS ug/L	% Recovery LCS	% Recovery DLCS	ALS Acceptance Limits	RPD	RPD Limit	Data Qualifier
7782-44-7	Oxygen/Argon*	22,900	22,700	21,600	**99**	**94**	50-150	5	30	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL. Oxygen free water cannot be achieved due to the nature of the matrix.
* = Coeluting compounds.

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Mar 13 2017
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your 702293 project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
GW-4	Water	17-A002329	DEM, MIN, NUT, CONV
GW-11	Water	17-A002330	DEM, MIN, NUT, CONV
MW-2	Water	17-A002331	DEM, MIN, NUT, CONV
MW-3	Water	17-A002332	DEM, MIN, NUT, CONV

Your samples were received on Tuesday, February 21, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

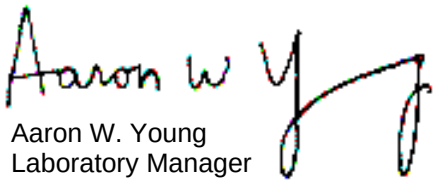
The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,



Aaron W. Young
Laboratory Manager

Project #: 702293
PO Number: E-504

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL
Project Name: 702293
Project #: 702293
PO Number: E-504
All results reported on an as received basis.

Date Received: 02/21/17
Date Reported: 3/13/17

AMTEST Identification Number **17-A002329**
Client Identification **GW-4**
Sampling Date **02/20/17, 10:32**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	0.58	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	3.68	mg/l		0.05	EPA 300.0	JC	02/21/17
Sulfate	7.76	mg/l		0.1	EPA 300.0	JC	02/21/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/21/17
Nitrate	0.399	mg/l		0.025	EPA 300.0	JC	02/21/17
Nitrate+Nitrite	0.399	mg/l		0.025	EPA 300.0	Calculated	

AMTEST Identification Number **17-A002330**
Client Identification **GW-11**
Sampling Date **02/20/17, 11:25**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	1.1	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	53.8	mg/l		0.05	EPA 300.0	JC	02/27/17
Sulfate	14.2	mg/l		0.1	EPA 300.0	JC	02/21/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/21/17
Nitrate	2.60	mg/l		0.025	EPA 300.0	JC	02/21/17
Nitrate+Nitrite	2.60	mg/l		0.025	EPA 300.0	Calculated	

AMTEST Identification Number **17-A002331**
Client Identification **MW-2**
Sampling Date **02/20/17, 12:40**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	2.7	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	1.24	mg/l		0.05	EPA 300.0	JC	02/21/17
Sulfate	1.13	mg/l		0.1	EPA 300.0	JC	02/21/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/21/17
Nitrate	11.2	mg/l		0.025	EPA 300.0	JC	02/24/17
Nitrate+Nitrite	11.2	mg/l		0.025	EPA 300.0	Calculated	

AMTEST Identification Number **17-A002332**
Client Identification **MW-3**
Sampling Date **02/20/17, 15:18**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

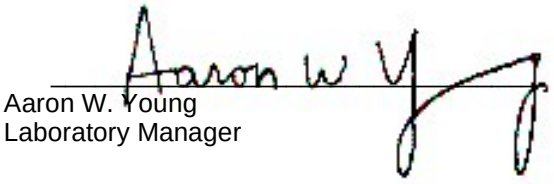
PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	83.	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	76.	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	430	mg/l		10	EPA 410.4	SW	03/07/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	34.5	mg/l		0.05	EPA 300.0	JC	02/27/17
Sulfate	0.78	mg/l		0.1	EPA 300.0	JC	02/21/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/21/17
Nitrate	< 0.025	mg/l		0.025	EPA 300.0	JC	02/21/17
Nitrate+Nitrite	< 0.025	mg/l		0.025	EPA 300.0	Calculated	



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 17-A002329 to 17-A002332

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A002401	BOD	mg/l	< 2	< 2	
17-A002124	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A002331	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A002401	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A002540	Chemical Oxygen Demand	mg/l	15.	13.	14.
17-A002550	Chemical Oxygen Demand	mg/l	25.	23.	8.3
17-A002329	Chloride	mg/l	3.68	3.71	0.81
17-A002247	Chloride	mg/l	88.8	87.6	1.4
17-A002469	Chloride	mg/l	46.0	44.5	3.3
17-A002329	Nitrate	mg/l	0.399	0.386	3.3
17-A002367	Nitrate	mg/l	< 0.025	< 0.025	
17-A002329	Nitrite	mg/l	< 0.005	< 0.005	
17-A002367	Nitrite	mg/l	< 0.005	< 0.005	
17-A002400	Total Sulfide	mg/l	< 0.05	< 0.05	
17-A002506	Total Sulfide	mg/l	< 0.05	< 0.05	
17-A002329	Sulfate	mg/l	7.76	7.06	9.4

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
17-A002044	Total Organic Carbon	mg/l	1.7	27.	25.	101.20 %
17-A002165	Total Organic Carbon	mg/l	2.3	25.	25.	90.80 %
17-A002175	Total Organic Carbon	mg/l	3.5	27.	25.	94.00 %
17-A002399	Total Organic Carbon	mg/l	5.7	49.	50.	86.60 %
17-A002329	Chloride	mg/l	3.68	8.65	5.00	99.40 %
17-A002247	Chloride	mg/l	88.8	133.	50.0	88.40 %
17-A002469	Chloride	mg/l	46.0	93.0	50.0	94.00 %
17-A002329	Nitrate	mg/l	0.399	5.22	5.00	96.42 %
17-A002329	Nitrite	mg/l	< 0.005	4.89	5.00	97.80 %
17-A002506	Total Sulfide	mg/l	< 0.05	0.34	0.39	87.18 %
17-A002329	Sulfate	mg/l	7.76	13.1	5.00	106.80 %

QC Summary for sample numbers: 17-A002329 to 17-A002332...

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	170	85.0 %
Total Organic Carbon	mg/l	50.	48.	96.0 %
Total Organic Carbon	mg/l	50.	48.	96.0 %
Chemical Oxygen Demand	mg/l	100	98.	98.0 %
Chemical Oxygen Demand	mg/l	100	96.	96.0 %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chloride	mg/l	5.00	4.97	99.4 %
Chloride	mg/l	5.00	4.88	97.6 %
Chloride	mg/l	5.00	4.89	97.8 %
Nitrate	mg/l	5.00	4.83	96.6 %
Nitrate	mg/l	5.00	4.61	92.2 %
Nitrite	mg/l	5.00	4.96	99.2 %
Total Sulfide	mg/l	0.39	0.34	87.2 %
Sulfate	mg/l	5.00	5.71	114. %

BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Page # 1 of 1

P.8

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Amtest

PROJECT NAME/NO.	PO #
702293	E-504

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	~~Volatile~~ VPH	Nitrate	Sulfate	~~Sulfide~~ Alkalinity	~~TOC~~ 9060M	COD	BOD		Notes
GW-4	2329	2/20/17	1032	water				X	X	X	X	X	X	X		
GW-11	30	"	1125	"				X	X	X	X	X	X	X		
MW-2	31	"	1240	"				X	X	X	X	X	X	X		
MW-3	32	"	1510	"				X	X	X	X	X	X	X		

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman and Bruya	2/21/17	0573
Received by: RM	FedEx T-56		2/21/17	1045
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

702293

SAMPLE CHAIN OF CUSTODY

ME 02/21/17 VW3/1 AE3

Page # 1 of 1

Report To Josh Bernthal

Company EPI

Address 1180 NW Maple St.

City, State, ZIP Issaquah, WA 98027

Phone 425-395-0016 Email joshb@epi-wa.com

SAMPLERS (*signature*)

PROJECT NAME 69402

PO #

REMARKS

INVOICE TO Skotdal

TURNAROUND TIME
- ☑ Standard Turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	TOC, CoD, BOD	Total / dissolved Iron & manganese	Sulfate / sulfide	Nitrate / nitrite	Methane, ethane, CO_2	Notes
GW-4	01 A-D	2-20-17	1032	Water	15					X			X	X	X	X	X	Chloride per SM 4500 Cl E
GW-11	02	2-20-17	1125	water	15					X			X	X	X	X	X	
MW-2	03	2-20-17	1240	water	15					X			X	X	X	X	X	
MW-3	04	2-20-17	1518	Water	15					X			X	X	X	X	X	

Samples received at 3 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Joe Sherrod	EPI	2-21-17	0600
Received by:	Michael Erdahl	FedEx	↓	↓
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

March 10, 2017

Josh Bernthal, Project Manager
Environmental Partners, Inc.
1180 NW Maple St, Suite 310
Issaquah, WA 98027

RE: 69402, F&BI 702316

Dear Mr Bernthal:

Included are the results from the testing of material submitted on February 21, 2017 from the 69402, F&BI 702316 project. There are 30 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Cynthia Moon
EPI0310R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 21, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 702316 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
702316-01	MW-15
702316-02	MW-1
702316-03	MW-7
702316-04	MW-8
702316-05	MW-9

The samples were sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the samples were sent to ALS-Simi for carbon dioxide analysis. The results from Amtest and ALS are included.

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-15	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/27/17	Lab ID:	702316-01
Date Analyzed:	02/28/17	Data File:	702316-01.126
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	241
Manganese	8.16

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-1	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/27/17	Lab ID:	702316-02
Date Analyzed:	02/28/17	Data File:	702316-02.130
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	991
Manganese	2,660

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-7	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/27/17	Lab ID:	702316-03
Date Analyzed:	02/28/17	Data File:	702316-03.134
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	295
Manganese	10.6

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-8	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/27/17	Lab ID:	702316-04
Date Analyzed:	02/28/17	Data File:	702316-04.138
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	364
Manganese	52.4

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-9	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/27/17	Lab ID:	702316-05
Date Analyzed:	02/28/17	Data File:	702316-05.139
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702316
Date Extracted:	02/27/17	Lab ID:	I7-096 mb
Date Analyzed:	02/27/17	Data File:	I7-096 mb.060
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-15	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/23/17	Lab ID:	702316-01
Date Analyzed:	02/23/17	Data File:	702316-01.067
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	58.6
Manganese	4.17

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-1	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/23/17	Lab ID:	702316-02
Date Analyzed:	02/23/17	Data File:	702316-02.068
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	494
Manganese	2,650

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-7	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/23/17	Lab ID:	702316-03
Date Analyzed:	02/23/17	Data File:	702316-03.069
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	101
Manganese	3.11

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-8	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/23/17	Lab ID:	702316-04
Date Analyzed:	02/23/17	Data File:	702316-04.070
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	55.7
Manganese	10.1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-9	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/23/17	Lab ID:	702316-05
Date Analyzed:	02/23/17	Data File:	702316-05.072
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702316
Date Extracted:	02/23/17	Lab ID:	I7-091 mb
Date Analyzed:	02/23/17	Data File:	I7-091 mb.062
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-15	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/24/17	Lab ID:	702316-01
Date Analyzed:	02/24/17	Data File:	022428.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	104	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	2.6
Tetrachloroethene	140

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-1	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/24/17	Lab ID:	702316-02
Date Analyzed:	02/24/17	Data File:	022429.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	1.4

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-7	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/24/17	Lab ID:	702316-03
Date Analyzed:	02/24/17	Data File:	022430.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	8.0

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-8	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/24/17	Lab ID:	702316-04
Date Analyzed:	02/24/17	Data File:	022431.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-9	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	02/24/17	Lab ID:	702316-05
Date Analyzed:	02/24/17	Data File:	022432.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	104	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	8.0

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702316
Date Extracted:	02/24/17	Lab ID:	07-0351 mb
Date Analyzed:	02/24/17	Data File:	022412.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-15	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	03/06/17	Lab ID:	702316-01
Date Analyzed:	03/06/17	Data File:	007F0701.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-1	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	03/06/17	Lab ID:	702316-02
Date Analyzed:	03/06/17	Data File:	008F0801.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-7	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	03/06/17	Lab ID:	702316-03
Date Analyzed:	03/06/17	Data File:	009F0901.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-8	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	03/06/17	Lab ID:	702316-04
Date Analyzed:	03/06/17	Data File:	010F1001.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-9	Client:	Environmental Partners
Date Received:	02/21/17	Project:	69402, F&BI 702316
Date Extracted:	03/06/17	Lab ID:	702316-05
Date Analyzed:	03/06/17	Data File:	011F1101.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702316
Date Extracted:	03/06/17	Lab ID:	07-356 mb
Date Analyzed:	03/06/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Date of Report: 03/10/17
Date Received: 02/21/17
Project: 69402, F&BI 702316

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 702402-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	2,970	195 b	0 b	70-130	200 b
Manganese	ug/L (ppb)	20	670	176 b	0 b	70-130	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	106	85-115
Manganese	ug/L (ppb)	20	107	85-115

Date of Report: 03/10/17
Date Received: 02/21/17
Project: 69402, F&BI 702316

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 702356-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	97.4	99	86	70-130	14
Manganese	ug/L (ppb)	20	134	141 b	120 b	70-130	16 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	90	85-115
Manganese	ug/L (ppb)	20	90	85-115

Date of Report: 03/10/17
Date Received: 02/21/17
Project: 69402, F&BI 702316

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 702387-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	<0.2	106	36-166
Chloroethane	ug/L (ppb)	50	<1	109	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	106	60-136
Methylene chloride	ug/L (ppb)	50	<5	98	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	101	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	101	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	102	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	98	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	103	60-146
Trichloroethene	ug/L (ppb)	50	<1	95	66-135
Tetrachloroethene	ug/L (ppb)	50	<1	98	10-226

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	107	118	50-154	10
Chloroethane	ug/L (ppb)	50	115	122	58-146	6
1,1-Dichloroethene	ug/L (ppb)	50	110	114	67-136	4
Methylene chloride	ug/L (ppb)	50	102	108	39-148	6
trans-1,2-Dichloroethene	ug/L (ppb)	50	105	108	68-128	3
1,1-Dichloroethane	ug/L (ppb)	50	105	107	79-121	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	104	109	80-123	5
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	100	105	73-132	5
1,1,1-Trichloroethane	ug/L (ppb)	50	107	110	83-130	3
Trichloroethene	ug/L (ppb)	50	98	102	80-120	4
Tetrachloroethene	ug/L (ppb)	50	99	105	76-121	6

Date of Report: 03/10/17
Date Received: 02/21/17
Project: 69402, F&BI 702316

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Laboratory Code: 703011-06 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methane	ug/L (ppb)	100	100	0
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methane	ug/L (ppb)	59	66	66	50-150	0
Ethane	ug/L (ppb)	110	57	58	50-150	2
Ethene	ug/L (ppb)	102	81	81	50-150	0

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

2655 Park Center Dr., Suite A
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www.alsglobal.com

LABORATORY REPORT

March 8, 2017

Mike Erdahl
Friedman & Bruya, Inc.
3012 16th Ave. W.
Seattle, WA 98119

RE: 702316 / 702316

Dear Mike:

Enclosed are the results of the samples submitted to our laboratory on February 23, 2017. For your reference, these analyses have been assigned our service request number P1700896.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Sue Anderson at 12:12 pm, Mar 08, 2017

Sue Anderson
Project Manager

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: Friedman & Bruya, Inc.
Project: 702316 / 702316

Service Request No: P1700896

CASE NARRATIVE

The samples were received intact under chain of custody on February 23, 2017 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gas (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1177034
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-004
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-16-7
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA016272016-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Friedman & Bruya, Inc.
Project ID: 702316

Service Request: P1700896

Date Received: 2/23/2017
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2
MW-15	P1700896-001	Water	2/21/2017	06:16	X
MW-1	P1700896-002	Water	2/21/2017	07:00	X
MW-7	P1700896-003	Water	2/21/2017	08:03	X
MW-8	P1700896-004	Water	2/21/2017	09:04	X
MW-9	P1700896-005	Water	2/21/2017	09:59	X

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Page # 1 of 1

Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 3012 16th Ave W
City, State, ZIP Seattle, WA 98119
Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER ~~Anatest~~ ALS-Simi Valley

PROJECT NAME/NO.	PO #
702316	E506

REMARKS
Please Email Results

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	CO_2			Notes
MW-15	1	2/21/17	0616	water									X			
MW-1	2	"	0700	"									X			
MW-7	3	"	0803	"									X			
MW-8	4	"	0904	"									X			
MW-9	5	"	0959	"									X			

Friedman & Bruya, Inc. 3012 16th Avenue West Seattle, WA 98119-2029 Ph. (206) 285-8282 Fax (206) 283-5044	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
	Relinquished by:	Michael Erdahl	Friedman and Bruya	2/24/17	1130
	Received by:				
	Relinquished by:				
	Received by:	2/23/17 0730	3°gel		

ALS Environmental
Sample Acceptance Check Form

Client: Friedman & Bruya, Inc. Work order: P1700896

Project: 702316

Sample(s) received on: 2/23/17 Date opened: 2/23/17 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: 3° C Blank Temperature: ° C **Gel Packs**			
8	Were **custody seals** on outside of cooler/Box/Container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1700896-001.01	40mL VOA NP		7		A	MC 3/2/2017
P1700896-001.02	40mL VOA NP				A	
P1700896-002.01	40mL VOA NP		7		A	MC 3/2/2017
P1700896-002.02	40mL VOA NP				A	
P1700896-003.01	40mL VOA NP		7		A	MC 3/2/2017
P1700896-003.02	40mL VOA NP				A	
P1700896-004.01	40mL VOA NP		7		A	MC 3/2/2017
P1700896-004.02	40mL VOA NP				A	
P1700896-005.01	40mL VOA NP		7		A	MC 3/2/2017
P1700896-005.02	40mL VOA NP				A	

Explain any discrepancies: (include lab sample ID numbers): _____

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Friedman & Bruya, Inc.**
Client Project ID: **702316**

ALS Project ID: P1700896

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date(s) Collected: 2/21/17
Date Received: 2/23/17
Date Analyzed: 3/2/17

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	MRL µg/L	Data Qualifier
MW-15	P1700896-001	0.10	**67,000**	1,000	
MW-1	P1700896-002	0.10	**130,000**	1,000	
MW-7	P1700896-003	0.10	**82,000**	1,000	
MW-8	P1700896-004	0.10	**59,000**	1,000	
MW-9	P1700896-005	0.10	**69,000**	1,000	
Method Control Sample	P170302-MB	0.10	ND	1,000	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **Friedman & Bruya, Inc.**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **702316**

ALS Project ID: P1700896
ALS Sample ID: P170302-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 3/02/17
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result$_1$ LCS ug/L	Result$_1$ DLCS ug/L	% Recovery LCS	% Recovery DLCS	ALS Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	22,700	21,600	**99**	**94**	62-123	5	20	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Mar 8 2017
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-15	Water	17-A002397	DEM, MIN, NUT, CONV
MW-1	Water	17-A002398	DEM, MIN, NUT, CONV
MW-7	Water	17-A002399	DEM, MIN, NUT, CONV
MW-8	Water	17-A002400	DEM, MIN, NUT, CONV
MW-9	Water	17-A002401	DEM, MIN, NUT, CONV

Your samples were received on Wednesday, February 22, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 702316
PO Number: E-503

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL
Project #: 702316
PO Number: E-503
All results reported on an as received basis.

Date Received: 02/22/17
Date Reported: 3/ 8/17

AMTEST Identification Number **17-A002397**
Client Identification **MW-15**
Sampling Date **02/21/17, 06:16**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	0.69	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	< 0.05	mg/l		0.05	EPA 300.0	JC	02/22/17
Sulfate	10.4	mg/l		0.1	EPA 300.0	JC	02/22/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/22/17
Nitrate	4.70	mg/l		0.025	EPA 300.0	JC	02/22/17

AMTEST Identification Number **17-A002398**
Client Identification **MW-1**
Sampling Date **02/21/17, 07:00**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	8.4	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	18.	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	26.2	mg/l		0.05	EPA 300.0	JC	02/22/17
Sulfate	4.30	mg/l		0.1	EPA 300.0	JC	02/22/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/22/17
Nitrate	0.995	mg/l		0.025	EPA 300.0	JC	02/22/17

AMTEST Identification Number **17-A002399**
Client Identification **MW-7**
Sampling Date **02/21/17, 08:03**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	5.7	mg/l		0.5	SM 5310B	SW	02/23/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	134.	mg/l		0.05	EPA 300.0	JC	02/24/17
Sulfate	12.3	mg/l		0.1	EPA 300.0	JC	02/22/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/22/17
Nitrate	5.30	mg/l		0.025	EPA 300.0	JC	02/22/17

AMTEST Identification Number **17-A002400**
Client Identification **MW-8**
Sampling Date **02/21/17, 09:04**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	0.51	mg/l		0.5	SM 5310B	SW	03/01/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	2.10	mg/l		0.05	EPA 300.0	JC	02/22/17
Sulfate	21.4	mg/l		0.1	EPA 300.0	JC	02/22/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/22/17
Nitrate	1.30	mg/l		0.025	EPA 300.0	JC	02/22/17

AMTEST Identification Number **17-A002401**
Client Identification **MW-9**
Sampling Date **02/21/17, 09:59**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	02/28/17

Demand

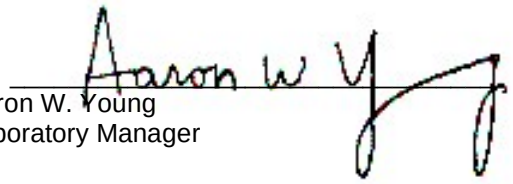
PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	02/22/17
Total Organic Carbon	< 0.5	mg/l		0.5	SM 5310B	SW	03/01/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	02/24/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	4.00	mg/l		0.05	EPA 300.0	JC	02/22/17
Sulfate	6.80	mg/l		0.1	EPA 300.0	JC	02/22/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	02/22/17
Nitrate	0.713	mg/l		0.025	EPA 300.0	JC	02/22/17



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 17-A002397 to 17-A002401

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A002401	BOD	mg/l	< 2	< 2	
17-A002124	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A002331	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A002401	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A002234	Chloride	mg/l	7.30	7.30	0.00
17-A002400	Total Sulfide	mg/l	< 0.05	< 0.05	
17-A002506	Total Sulfide	mg/l	< 0.05	< 0.05	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
17-A002044	Total Organic Carbon	mg/l	1.7	27.	25.	101.20 %
17-A002165	Total Organic Carbon	mg/l	2.3	25.	25.	90.80 %
17-A002175	Total Organic Carbon	mg/l	3.5	27.	25.	94.00 %
17-A002399	Total Organic Carbon	mg/l	5.7	49.	50.	86.60 %
17-A002539	Total Organic Carbon	mg/l	9.9	57.	50.	94.20 %
17-A002549	Total Organic Carbon	mg/l	8.5	56.	50.	95.00 %
17-A002234	Chloride	mg/l	7.30	12.1	5.00	96.00 %
17-A002506	Total Sulfide	mg/l	< 0.05	0.34	0.39	87.18 %

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	170	85.0 %
Total Organic Carbon	mg/l	50.	48.	96.0 %
Total Organic Carbon	mg/l	50.	48.	96.0 %
Total Organic Carbon	mg/l	50.	48.	96.0 %
Total Organic Carbon	mg/l	50.	48.	96.0 %
Chemical Oxygen Demand	mg/l	100	98.	98.0 %
Chemical Oxygen Demand	mg/l	100	96.	96.0 %
Chloride	mg/l	5.00	4.92	98.4 %
Chloride	mg/l	5.00	4.88	97.6 %
Chloride	mg/l	5.00	4.87	97.4 %
Nitrate	mg/l	5.00	4.78	95.6 %
Nitrite	mg/l	5.00	4.92	98.4 %
Total Sulfide	mg/l	0.39	0.34	87.2 %
Sulfate	mg/l	5.00	5.22	104. %

QC Summary for sample numbers: 17-A002397 to 17-A002401...

BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

P.10

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Amtest

PROJECT NAME/NO.	PO #
702316	E-503

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	Chloride ~~EPH~~	Nitrite ~~VPH~~	Nitrate	Sulfate	Sulfide Alkalinity	TOC-9060M	TOC	COD	BOD	Notes
MW-15	2397	2/21/17	0616	water			X	X	X	X	X		X	X	X	
MW-1	98		0700				X	X	X	X	X		X	X	X	
MW-7	99		0803				X	X	X	X	X		X	X	X	
MW-8	2400		0904				X	X	X	X	X		X	X	X	
MW-9	01		0959				X	X	X	X	X		X	X	X	

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman and Bruya	2/21/17	0800
Received by: AS	ALANNA STAAB T=7.0	AMTEST	2/22/17	10:38
Relinquished by:	FEDEX			
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

702316

SAMPLE CHAIN OF CUSTODY

ME 02/21/17 VW4/1 AI3

Page # 1 of 1

Report To Josh Bernhal

Company EPI

Address 1180 NW Maple St

City, State, ZIP Issaquah, WA 98027

Phone 425-395-0010 Email josh@epi-nw.com

SAMPLERS (*signature*)

PROJECT NAME: 69402

PO #:

REMARKS:

INVOICE TO: Sicotdal

TURNAROUND TIME
- ☑ Standard Turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	cVOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Toc, BoD, CoD	Total / dissolved Iron + Manganese	Chloride, Sulfate, Nitrate	Methane, Ethane, CO_2	Notes
MW-15	01A-D	2-21-17	0616	Water	15					X			X	X	X	X	
MW-1	02	↓	0700	Water	↓					↓			↓	↓	↓	↓	
MW-7	03		0803	Water													
MW-8	04		0904	Water													
MW-9	05	↓	0959	Water	↓					↓			↓	↓	↓	↓	

Samples received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Joe Shemet	EPI	2-21-17	1320
Received by:	VINT	FBI	2-21-17	1320
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

March 2, 2017

Josh Bernthal, Project Manager
Environmental Partners, Inc.
1180 NW Maple St, Suite 310
Issaquah, WA 98027

RE: 69402, F&BI 702321

Dear Mr Bernthal:

Included are the results from the testing of material submitted on February 22, 2017 from the 69402, F&BI 702321 project. There are 20 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Cynthia Moon
EPI0302R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 22, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 702321 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
702321 -01	MW-5:Bag
702321 -02	MW-10:Bag
702321 -03	MW-4:Bag
702321 -04	MW-11:Bag
702321 -05	MW-14:Bag
702321 -06	MW-12:Bag
702321 -07	GW-10:Bag
702321 -08	MW-13:Bag
702321 -09	GW-1:Bag
702321 -10	GW-7:Bag
702321 -11	GW-8:Bag
702321 -12	GW-9:Bag
702321 -13	GW-5:Bag
702321 -14	GW-6:Bag
702321 -15	GW-3:Bag
702321 -16	MW-6:Bag

All quality control requirements were acceptable.

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-5:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-01
Date Analyzed:	02/23/17	Data File:	022309.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	44

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-10:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-02
Date Analyzed:	02/23/17	Data File:	022327.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	1.1
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	15
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	1.2
Tetrachloroethene	5.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-4:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-03
Date Analyzed:	02/23/17	Data File:	022333.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	2.3
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	22
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	1.1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-11:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-04
Date Analyzed:	02/23/17	Data File:	022326.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	7.4
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	25
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	8.0
Tetrachloroethene	2.7

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-14:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-05
Date Analyzed:	02/23/17	Data File:	022310.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-12:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-06
Date Analyzed:	02/23/17	Data File:	022311.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	1.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-10:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-07
Date Analyzed:	02/23/17	Data File:	022324.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	14
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-13:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-08
Date Analyzed:	02/23/17	Data File:	022312.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	3.0

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-1:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-09
Date Analyzed:	02/23/17	Data File:	022313.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-7:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-10
Date Analyzed:	02/23/17	Data File:	022314.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-8:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-11
Date Analyzed:	02/23/17	Data File:	022325.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	16

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-9:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-12
Date Analyzed:	02/23/17	Data File:	022315.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-5:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-13
Date Analyzed:	02/23/17	Data File:	022316.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	2.5

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-6:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-14
Date Analyzed:	02/23/17	Data File:	022317.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	6.0

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-3:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-15
Date Analyzed:	02/23/17	Data File:	022318.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-6:Bag	Client:	Environmental Partners
Date Received:	02/22/17	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	702321-16
Date Analyzed:	02/23/17	Data File:	022319.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	99	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 702321
Date Extracted:	02/23/17	Lab ID:	07-0349 mb
Date Analyzed:	02/23/17	Data File:	022308.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Date of Report: 03/02/17
Date Received: 02/22/17
Project: 69402, F&BI 702321

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 702321-12 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	<0.2	101	36-166
Chloroethane	ug/L (ppb)	50	<1	114	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	104	60-136
Methylene chloride	ug/L (ppb)	50	<5	94	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	100	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	100	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	99	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	97	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	101	60-146
Trichloroethene	ug/L (ppb)	50	<1	94	66-135
Tetrachloroethene	ug/L (ppb)	50	<1	95	10-226

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	106	102	50-154	4
Chloroethane	ug/L (ppb)	50	116	102	58-146	13
1,1-Dichloroethene	ug/L (ppb)	50	107	103	67-136	4
Methylene chloride	ug/L (ppb)	50	104	97	39-148	7
trans-1,2-Dichloroethene	ug/L (ppb)	50	103	99	68-128	4
1,1-Dichloroethane	ug/L (ppb)	50	103	99	79-121	4
cis-1,2-Dichloroethene	ug/L (ppb)	50	105	99	80-123	6
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	100	95	73-132	5
1,1,1-Trichloroethane	ug/L (ppb)	50	106	100	83-130	6
Trichloroethene	ug/L (ppb)	50	98	93	80-120	5
Tetrachloroethene	ug/L (ppb)	50	102	96	76-121	6

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

702321

SAMPLE CHAIN OF CUSTODY

ME 02/22/17

VWG

Page # 1 of 2

Report To Josh Bernthal

Company EPI

Address 1180 NW Maple St.

City, State, ZIP Issaquah, WA 98027

Phone 425-395-0065 Email

SAMPLERS (*signature*)

PROJECT NAME: 194402

PO #

REMARKS

INVOICE TO: SICotdal

TURNAROUND TIME
- ☑ Standard Turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	cVOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM					Notes
MW-5 : Bag	01 A C	2-21-17	1045	W	3					X							
MW-6 : Bag	02		1055														
MW-4 : Bag	03		1105														
MW-11 : Bag	04		1120														
MW-14 : Bag	05		1130														
MW-12 : Bag	06		1140														
GW-10 : Bag	07		1150														
MW-13 : Bag	08		1200														
GW-1 : Bag	09		1230														Samples received at 2 °C
GW-7 : Bag	10 C	↓	1240	↓	↓					↓							

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Joe Sherrod	EPI	2-22-17	0600
Received by:	Michael Erdahl	FBR	↓	0830
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

702321

SAMPLE CHAIN OF CUSTODY

ME 02/22/17

VWA

Page # 2 of 2

Report To Josh Bernthal

Company EPI

Address 1180 NW Maple St.

City, State, ZIP Issaquah, WA 98027

Phone 425-395-0610 Email

SAMPLERS (*signature*)

PROJECT NAME: 69402

PO #

REMARKS

INVOICE TO: SKotdal

TURNAROUND TIME
- ☑ Standard Turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM					Notes
GW-8: Bag	11A	2-21-17	1250	W	3					X							
GW-9: Bag	12		1300														
GW-5: Bag	13		1310														
GW-6: Bag	14		1320														
GW-3: Bag	15		1330														
MW-6: Bag	16	↓	1210	↓	↓					↓							
																	Samples received at 2 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Joe Shemd	EPI	2-22-17	0600
Received by:	Michael Eckhl	FEBruya	↓	0630
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

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Seattle, WA 98119-2029
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fbi@isomedia.com
www.friedmanandbruya.com

June 13, 2017

Eric Koltes, Project Manager
Environmental Partners, Inc.
1180 NW Maple St, Suite 310
Issaquah, WA 98027

RE: 69402, F&BI 705438

Dear Mr Koltes:

Included are the results from the testing of material submitted on May 24, 2017 from the 69402, F&BI 705438 project. There are 18 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Cynthia Moon, Josh Bernthal
EPI0613R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 24, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 705438 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
705438-01	MW-8
705438-02	GW-11

The samples were sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the samples were sent to Fremont for carbon dioxide analysis. The reports are included.

All quality control requirements were acceptable.

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-8	Client:	Environmental Partners
Date Received:	05/24/17	Project:	69402, F&BI 705438
Date Extracted:	05/30/17	Lab ID:	705438-01
Date Analyzed:	05/30/17	Data File:	705438-01.135
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	13.6

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	GW-11	Client:	Environmental Partners
Date Received:	05/24/17	Project:	69402, F&BI 705438
Date Extracted:	05/30/17	Lab ID:	705438-02
Date Analyzed:	05/30/17	Data File:	705438-02.136
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	83.0
Manganese	3.19

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705438
Date Extracted:	05/30/17	Lab ID:	I7-295 mb
Date Analyzed:	05/30/17	Data File:	I7-295 mb.062
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-8	Client:	Environmental Partners
Date Received:	05/24/17	Project:	69402, F&BI 705438
Date Extracted:	05/30/17	Lab ID:	705438-01
Date Analyzed:	05/30/17	Data File:	705438-01.137
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	324
Manganese	186

Analysis For Total Metals By EPA Method 200.8

Client ID:	GW-11	Client:	Environmental Partners
Date Received:	05/24/17	Project:	69402, F&BI 705438
Date Extracted:	05/30/17	Lab ID:	705438-02
Date Analyzed:	05/30/17	Data File:	705438-02.138
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	106
Manganese	3.73

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705438
Date Extracted:	05/30/17	Lab ID:	I7-294 mb
Date Analyzed:	05/30/17	Data File:	I7-294 mb.079
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-8	Client:	Environmental Partners
Date Received:	05/24/17	Project:	69402, F&BI 705438
Date Extracted:	05/25/17	Lab ID:	705438-01
Date Analyzed:	05/25/17	Data File:	052511.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-11	Client:	Environmental Partners
Date Received:	05/24/17	Project:	69402, F&BI 705438
Date Extracted:	05/25/17	Lab ID:	705438-02
Date Analyzed:	05/25/17	Data File:	052512.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	105	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	15

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705438
Date Extracted:	05/25/17	Lab ID:	07-1041 mb
Date Analyzed:	05/25/17	Data File:	052505.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	105	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-8	Client:	Environmental Partners
Date Received:	05/24/17	Project:	69402, F&BI 705438
Date Extracted:	05/30/17	Lab ID:	705438-01
Date Analyzed:	05/30/17	Data File:	006F0601.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	GW-11	Client:	Environmental Partners
Date Received:	05/24/17	Project:	69402, F&BI 705438
Date Extracted:	05/30/17	Lab ID:	705438-02
Date Analyzed:	05/30/17	Data File:	007F0701.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705438
Date Extracted:	05/30/17	Lab ID:	07-1154 mb
Date Analyzed:	05/30/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Date of Report: 06/13/17
Date Received: 05/24/17
Project: 69402, F&BI 705438

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 705461-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	1,880	101 b	183 b	70-130	58 b
Manganese	ug/L (ppb)	20	3,820	0 b	1200 b	70-130	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	100	85-115
Manganese	ug/L (ppb)	20	112	85-115

Date of Report: 06/13/17
Date Received: 05/24/17
Project: 69402, F&BI 705438

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 705475-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	73.3	97 b	121 b	70-130	22 b
Manganese	ug/L (ppb)	20	118	70 b	139 b	70-130	66 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	105	85-115
Manganese	ug/L (ppb)	20	113	85-115

Date of Report: 06/13/17
Date Received: 05/24/17
Project: 69402, F&BI 705438

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 705442-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	<0.2	97	36-166
Chloroethane	ug/L (ppb)	50	<1	112	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	104	60-136
Methylene chloride	ug/L (ppb)	50	<5	100	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	102	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	95	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	100	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	104	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	104	60-146
Trichloroethene	ug/L (ppb)	50	<1	99	66-135
Tetrachloroethene	ug/L (ppb)	50	<1	92	10-226

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	89	87	50-154	2
Chloroethane	ug/L (ppb)	50	104	102	58-146	2
1,1-Dichloroethene	ug/L (ppb)	50	97	94	67-136	3
Methylene chloride	ug/L (ppb)	50	98	99	39-148	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	97	93	68-128	4
1,1-Dichloroethane	ug/L (ppb)	50	90	88	79-121	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	93	91	80-123	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	96	94	73-132	2
1,1,1-Trichloroethane	ug/L (ppb)	50	100	96	83-130	4
Trichloroethene	ug/L (ppb)	50	94	91	80-120	3
Tetrachloroethene	ug/L (ppb)	50	91	89	76-121	2

Date of Report: 06/13/17
Date Received: 05/24/17
Project: 69402, F&BI 705438

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Laboratory Code: 705461-04 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methane	ug/L (ppb)	<5	<5	nm
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methane	ug/L (ppb)	59	79	79	50-150	0
Ethane	ug/L (ppb)	110	70	70	50-150	0
Ethene	ug/L (ppb)	102	94	94	50-150	0

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 705438
Work Order Number: 1705335

June 02, 2017

Attention Michael Erdahl:

Fremont Analytical, Inc. received 2 sample(s) on 5/30/2017 for the analyses presented in the following report.

Total Alkalinity by SM 2320B

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

Date: *06/02/2017*

CLIENT: Friedman & Bruya
Project: 705438
Work Order: 1705335

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1705335-001	MW-8	05/24/2017 1:29 PM	05/30/2017 1:04 PM
1705335-002	GW-11	05/24/2017 2:57 PM	05/30/2017 1:04 PM

Case Narrative

WO#: **1705335**
Date: **6/2/2017**

CLIENT: Friedman & Bruya
Project: 705438

WorkOrder Narrative:
I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1705335**
Date Reported: **6/2/2017**

CLIENT: Friedman & Bruya
Project: 705438

Lab ID: 1705335-001 **Collection Date:** 5/24/2017 1:29:00 PM
Client Sample ID: **MW-8** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B				Batch ID: R36524		Analyst: MW
Carbon dioxide	145	5.00		mg/L	1	6/1/2017 12:10:00 PM

Lab ID: 1705335-002 **Collection Date:** 5/24/2017 2:57:00 PM
Client Sample ID: **GW-11** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B				Batch ID: R36524		Analyst: MW
Carbon dioxide	148	5.00		mg/L	1	6/1/2017 12:15:00 PM

Work Order: 1705335
CLIENT: Friedman & Bruya
Project: 705438

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID **MB-R36524**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **6/1/2017**			RunNo: **36524**	
Client ID: **MBLKW**	Batch ID: **R36524**					Analysis Date: **6/1/2017**			SeqNo: **700651**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID **LCS-R36524**	SampType: **LCS**			Units: **mg/L**		Prep Date: **6/1/2017**			RunNo: **36524**	
Client ID: **LCSW**	Batch ID: **R36524**					Analysis Date: **6/1/2017**			SeqNo: **700652**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	113	2.50	100.0	0	113	80	120				

Sample ID **1705343-001FDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **6/1/2017**			RunNo: **36524**	
Client ID: **BATCH**	Batch ID: **R36524**					Analysis Date: **6/1/2017**			SeqNo: **700654**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	2,520	2.50						2,572	2.06	20	

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1705335**
Logged by:	**Erica Silva**	Date Received:	**5/30/2017 1:04:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☐	No ☑	NA ☐
	Samples received at appropriate temperature			
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☑	Not Required ☐
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☐	No ☑	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☑	NA ☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample	6.1

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

1705335

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont

PROJECT NAME/NO.	PO #
705438	E-653

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	Dissolved CO2			Notes
MW-8		5/24/17	1329	water	3								X			
GW-11		↓	1457	1	3								X			

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman and Bruya	5/30/17	11:00AM
Received by:			5/30/17	1304
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jun 9 2017
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-8	Water	17-A007750	DEM, MIN, NUT, CONV
GW-11	Water	17-A007751	DEM, MIN, NUT, CONV

Your samples were received on Thursday, May 25, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 705438
PO Number: E-646

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL
Project #: 705438
PO Number: E-646
All results reported on an as received basis.

Date Received: 05/25/17
Date Reported: 6/ 9/17

AMTEST Identification Number **17-A007750**
Client Identification **MW-8**
Sampling Date **05/24/17, 13:29**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/25/17
Total Organic Carbon	0.65	mg/l		0.5	SM 5310B	SW	05/30/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	2.60	mg/l		0.05	EPA 300.0	JC	05/26/17
Sulfate	21.6	mg/l		0.1	EPA 300.0	JC	05/31/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	1.00	mg/l		0.025	EPA 300.0	JC	05/26/17

AMTEST Identification Number **17-A007751**
Client Identification **GW-11**
Sampling Date **05/24/17, 14:57**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

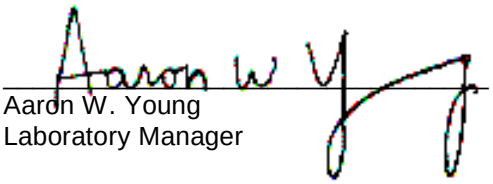
PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/25/17
Total Organic Carbon	1.2	mg/l		0.5	SM 5310B	SW	05/30/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	41.3	mg/l		0.05	EPA 300.0	JC	06/01/17
Sulfate	25.4	mg/l		0.1	EPA 300.0	JC	06/01/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	3.10	mg/l		0.025	EPA 300.0	JC	05/26/17



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 17-A007750 to 17-A007751

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A007743	BOD	mg/l	5.0	5.3	5.8
17-A007701	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007813	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007927	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007824	Nitrate	mg/l	0.102	0.093	9.2
17-A007824	Nitrite	mg/l	< 0.005	< 0.005	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
17-A007701	Total Organic Carbon	mg/l	1.5	3.1	2.0	80.00 %
17-A007751	Total Organic Carbon	mg/l	1.2	3.0	2.0	90.00 %
17-A007701	Chemical Oxygen Demand	mg/l	< 10	45.	50.	90.00 %
17-A007813	Chemical Oxygen Demand	mg/l	< 10	89.	100	89.00 %
17-A007927	Chemical Oxygen Demand	mg/l	< 10	86.	100	86.00 %
17-A007824	Nitrate	mg/l	0.102	4.93	5.00	96.56 %
17-A007824	Nitrite	mg/l	< 0.005	4.81	5.00	96.20 %
17-A007817	Total Sulfide	mg/l	< 0.05	0.54	0.50	108.00 %
17-A007817	Total Sulfide	mg/l	< 0.05	0.54	0.50	108.00 %

MATRIX SPIKE DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE + SPK	MSD VALUE	RPD
Spike	Total Sulfide	mg/l	0.54	0.54	0.00

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	190	95.0 %
Total Organic Carbon	mg/l	5.0	5.3	106. %
Total Organic Carbon	mg/l	5.0	4.9	98.0 %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chemical Oxygen Demand	mg/l	100	110	110. %
Chloride	mg/l	5.00	5.11	102. %
Chloride	mg/l	5.00	4.88	97.6 %
Nitrate	mg/l	5.00	4.92	98.4 %
Nitrate	mg/l	5.00	4.96	99.2 %
Nitrite	mg/l	5.00	5.00	100. %
Nitrite	mg/l	5.00	5.00	100. %
Total Sulfide	mg/l	1.0	1.0	100. %
Sulfate	mg/l	5.00	5.45	109. %
Sulfate	mg/l	5.00	5.17	103. %

QC Summary for sample numbers: 17-A007750 to 17-A007751...

BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1
Sulfate	mg/l	< 0.1

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Page # 1 of 1

P.6

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Anatest

PROJECT NAME/NO.	PO #
705438	E-646

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	Sulfide ~~VPH~~	Nitrate	Sulfate	Chloride Alkalinity	~~TOC~~ ~~9060M~~	COD	Nitrite	BOD	Notes
MW-8	7750	5/24/17	1329	water	5			X	X	X	X	X	X	X	X	
GW-11	51	↓	1457	↓	5			X	X	X	X	X	X	X	X	

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman and Bruya	5/25/17	10:01
Received by:	MJ		5/25/17	1300
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

705438

SAMPLE CHAIN OF CUSTODY

ME 05/25/17 AI4/VW/3

Page # 1 of

Report To Eric Koltes/Josh Bernthal

Company EPI

Address 1180 NW Maple St

City, State, ZIP Issaquah, WA 98027

Phone ______ Email ______

SAMPLERS (signature) E D W-B	
PROJECT NAME 69402	PO #
REMARKS	INVOICE TO

TURNAROUND TIME
- ☒ Standard Turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	CVOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Total Mn/Fe	Dissolved Mn/Fe	Methane/Ethane/Ethene	TOC/COD	Nitrate/Nitrite	Sulfate/Chloride	BOD	Sulfide	CO2	Notes
MW-8	01A-P	5/24/17	1329	H_2O	16					X			X	X	X	X	X	X	X	X	X	
GW-11	02A-P	↓	1457	H_2O	16					X			X	X	X	X	X	X	X	X	X	
																						Mn per LWB
																						5/27/17
																						AC

Samples received at 5 °C

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	E D W-B	Elizabeth Webber-Bruya	EPI	5/24/17	1650
Received by:	[signature]	HONG NGUYEN	FBI	✓	✓
Relinquished by:					
Received by:					

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 13, 2017

Eric Koltes, Project Manager
Environmental Partners, Inc.
1180 NW Maple St, Suite 310
Issaquah, WA 98027

RE: 69402, F&BI 705461

Dear Mr Koltes:

Included are the results from the testing of material submitted on May 25, 2017 from the 69402, F&BI 705461 project. There are 26 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Cynthia Moon, Josh Bernthal
EPI0613R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 25, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 705461 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
705461 -01	MW-1
705461 -02	MW-7
705461 -03	MW-15
705461 -04	MW-9

The samples were sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the samples were sent to Fremont for carbon dioxide analysis. The reports are included.

All quality control requirements were acceptable.

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-1	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	705461-01
Date Analyzed:	05/30/17	Data File:	705461-01.099
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	1,880
Manganese	3,820

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-7	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	705461-02
Date Analyzed:	05/30/17	Data File:	705461-02.103
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	303
Manganese	10.4

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-15	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	705461-03
Date Analyzed:	05/30/17	Data File:	705461-03.104
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	3.37

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-9	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	705461-04
Date Analyzed:	05/30/17	Data File:	705461-04.105
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	I7-295 mb
Date Analyzed:	05/30/17	Data File:	I7-295 mb.062
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-1	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	705461-01
Date Analyzed:	05/30/17	Data File:	705461-01.121
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	2,740
Manganese	3,490

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-7	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	705461-02
Date Analyzed:	05/30/17	Data File:	705461-02.122
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	323
Manganese	10.9

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-15	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	705461-03
Date Analyzed:	05/30/17	Data File:	705461-03.130
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	62.5
Manganese	3.31

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-9	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	705461-04
Date Analyzed:	05/30/17	Data File:	705461-04.131
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	1.02

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	I7-294 mb
Date Analyzed:	05/30/17	Data File:	I7-294 mb.079
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-1	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/26/17	Lab ID:	705461-01
Date Analyzed:	05/26/17	Data File:	052618.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	104	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	2.4

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-7	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/26/17	Lab ID:	705461-02
Date Analyzed:	05/26/17	Data File:	052619.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	105	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	11

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-15	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/26/17	Lab ID:	705461-03
Date Analyzed:	05/26/17	Data File:	052620.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	105	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	1.1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	2.7
Tetrachloroethene	120

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-9	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/26/17	Lab ID:	705461-04
Date Analyzed:	05/26/17	Data File:	052621.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	105	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	5.4

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705461
Date Extracted:	05/26/17	Lab ID:	07-1044 mb
Date Analyzed:	05/26/17	Data File:	052609.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-1	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	705461-01
Date Analyzed:	05/30/17	Data File:	008F0801.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	9.0
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-7	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	705461-02
Date Analyzed:	05/30/17	Data File:	009F0901.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-15	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	705461-03
Date Analyzed:	05/30/17	Data File:	010F1001.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-9	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	705461-04
Date Analyzed:	05/30/17	Data File:	011F1101.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705461
Date Extracted:	05/30/17	Lab ID:	07-1154 mb
Date Analyzed:	05/30/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Date of Report: 06/13/17
Date Received: 05/25/17
Project: 69402, F&BI 705461

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 705461-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	1,880	101 b	183 b	70-130	58 b
Manganese	ug/L (ppb)	20	3,820	0 b	1200 b	70-130	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	100	85-115
Manganese	ug/L (ppb)	20	112	85-115

Date of Report: 06/13/17
Date Received: 05/25/17
Project: 69402, F&BI 705461

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 705475-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	73.3	97 b	121 b	70-130	22 b
Manganese	ug/L (ppb)	20	118	70 b	139 b	70-130	66 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	105	85-115
Manganese	ug/L (ppb)	20	113	85-115

Date of Report: 06/13/17
Date Received: 05/25/17
Project: 69402, F&BI 705461

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 705475-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	<0.2	84	36-166
Chloroethane	ug/L (ppb)	50	<1	98	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	97	60-136
Methylene chloride	ug/L (ppb)	50	<5	96	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	95	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	89	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	92	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	95	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	96	60-146
Trichloroethene	ug/L (ppb)	50	<1	92	66-135
Tetrachloroethene	ug/L (ppb)	50	4.1	90	10-226

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	87	83	50-154	5
Chloroethane	ug/L (ppb)	50	99	97	58-146	2
1,1-Dichloroethene	ug/L (ppb)	50	95	96	67-136	1
Methylene chloride	ug/L (ppb)	50	91	88	39-148	3
trans-1,2-Dichloroethene	ug/L (ppb)	50	94	94	68-128	0
1,1-Dichloroethane	ug/L (ppb)	50	89	87	79-121	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	91	91	80-123	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	96	93	73-132	3
1,1,1-Trichloroethane	ug/L (ppb)	50	99	95	83-130	4
Trichloroethene	ug/L (ppb)	50	92	90	80-120	2
Tetrachloroethene	ug/L (ppb)	50	93	89	76-121	4

Date of Report: 06/13/17
Date Received: 05/25/17
Project: 69402, F&BI 705461

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Laboratory Code: 705461-04 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methane	ug/L (ppb)	<5	<5	nm
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methane	ug/L (ppb)	59	79	79	50-150	0
Ethane	ug/L (ppb)	110	70	70	50-150	0
Ethene	ug/L (ppb)	102	94	94	50-150	0

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 705461
Work Order Number: 1705336

June 02, 2017

Attention Michael Erdahl:

Fremont Analytical, Inc. received 4 sample(s) on 5/30/2017 for the analyses presented in the following report.

Total Alkalinity by SM 2320B

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

Date: *06/02/2017*

CLIENT: Friedman & Bruya
Project: 705461
Work Order: 1705336

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1705336-001	MW-1	05/25/2017 8:13 AM	05/30/2017 1:04 PM
1705336-002	MW-7	05/25/2017 9:06 AM	05/30/2017 1:04 PM
1705336-003	MW-15	05/25/2017 10:00 AM	05/30/2017 1:04 PM
1705336-004	MW-9	05/25/2017 11:21 AM	05/30/2017 1:04 PM

Case Narrative

WO#: **1705336**
Date: **6/2/2017**

CLIENT: Friedman & Bruya
Project: 705461

WorkOrder Narrative:
I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

CLIENT: Friedman & Bruya
Project: 705461

Lab ID: 1705336-001 **Collection Date:** 5/25/2017 8:13:00 AM
Client Sample ID: **MW-1** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B				Batch ID: R36524		Analyst: MW
Carbon dioxide	370	5.00		mg/L	1	6/1/2017 11:50:00 AM

Lab ID: 1705336-002 **Collection Date:** 5/25/2017 9:06:00 AM
Client Sample ID: **MW-7** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B				Batch ID: R36524		Analyst: MW
Carbon dioxide	137	5.00		mg/L	1	6/1/2017 11:55:00 AM

Lab ID: 1705336-003 **Collection Date:** 5/25/2017 10:00:00 AM
Client Sample ID: **MW-15** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B				Batch ID: R36524		Analyst: MW
Carbon dioxide	116	5.00		mg/L	1	6/1/2017 12:00:00 PM

Analytical Report

Work Order: **1705336**
Date Reported: **6/2/2017**

CLIENT: Friedman & Bruya
Project: 705461

Lab ID: 1705336-004 **Collection Date:** 5/25/2017 11:21:00 AM
Client Sample ID: **MW-9** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B				Batch ID: R36524		Analyst: MW
Carbon dioxide	92.8	5.00		mg/L	1	6/1/2017 12:05:00 PM

Work Order: 1705336
CLIENT: Friedman & Bruya
Project: 705461

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID **MB-R36524**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **6/1/2017**			RunNo: **36524**		
Client ID: **MBLKW**	Batch ID: **R36524**					Analysis Date: **6/1/2017**			SeqNo: **700651**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID **LCS-R36524**	SampType: **LCS**			Units: **mg/L**		Prep Date: **6/1/2017**			RunNo: **36524**		
Client ID: **LCSW**	Batch ID: **R36524**					Analysis Date: **6/1/2017**			SeqNo: **700652**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	113	2.50	100.0	0	113	80	120				

Sample ID **1705343-001FDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **6/1/2017**			RunNo: **36524**		
Client ID: **BATCH**	Batch ID: **R36524**					Analysis Date: **6/1/2017**			SeqNo: **700654**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	2,520	2.50						2,572	2.06	20	

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1705336**
Logged by:	**Erica Silva**	Date Received:	**5/30/2017 1:04:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☐	No ☑	NA ☐
	Samples received at appropriate temperature			
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☑	Not Required ☐
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☐	No ☑	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☑	NA ☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample	6.1

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

1705336

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont

PROJECT NAME/NO.	PO #
705461	E-653

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	Dissolved CO2			Notes
MW-1		5/25/17	0813	water	3								X			
MW-7		"	0906	"	3								X			
MW-15		"	1000	"	3								X			
MW-9		"	1121	"	3								X			

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman and Bruya	5/30/17	11:00AM
Received by:				5/30/17	1304
Relinquished by:					
Received by:					

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jun 9 2017
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-1	Water	17-A007810	DEM, MIN, NUT, CONV
MW-7	Water	17-A007811	DEM, MIN, NUT, CONV
MW-15	Water	17-A007812	DEM, MIN, NUT, CONV
MW-9	Water	17-A007813	DEM, MIN, NUT, CONV

Your samples were received on Friday, May 26, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 705461
PO Number: E-647

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL
Project #: 705461
PO Number: E-647
All results reported on an as received basis.

Date Received: 05/26/17
Date Reported: 6/ 9/17

AMTEST Identification Number **17-A007810**
Client Identification **MW-1**
Sampling Date **05/25/17, 08:13**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/26/17
Total Organic Carbon	9.6	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	36.2	mg/l		0.05	EPA 300.0	JC	06/05/17
Sulfate	5.50	mg/l		0.1	EPA 300.0	JC	05/26/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	0.901	mg/l		0.025	EPA 300.0	JC	05/26/17

AMTEST Identification Number **17-A007811**
Client Identification **MW-7**
Sampling Date **05/25/17, 09:06**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/26/17
Total Organic Carbon	1.2	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	617.	mg/l		0.05	EPA 300.0	JC	06/01/17
Sulfate	17.6	mg/l		0.1	EPA 300.0	JC	06/01/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	4.40	mg/l		0.025	EPA 300.0	JC	05/26/17

AMTEST Identification Number **17-A007812**
Client Identification **MW-15**
Sampling Date **05/25/17, 10:00**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/26/17
Total Organic Carbon	1.0	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	10.4	mg/l		0.05	EPA 300.0	JC	06/01/17
Sulfate	12.4	mg/l		0.1	EPA 300.0	JC	06/01/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	1.90	mg/l		0.025	EPA 300.0	JC	05/26/17

AMTEST Identification Number **17-A007813**
Client Identification **MW-9**
Sampling Date **05/25/17, 11:21**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

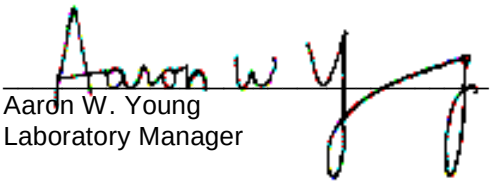
PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/26/17
Total Organic Carbon	< 0.5	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	5.08	mg/l		0.05	EPA 300.0	JC	05/26/17
Sulfate	8.10	mg/l		0.1	EPA 300.0	JC	05/26/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	0.753	mg/l		0.025	EPA 300.0	JC	05/26/17



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

AMTEST LABORATORIES

Professional Analytical Services

QC Summary for sample numbers: 17-A007810 to 17-A007813

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A007796	BOD	mg/l	4.6	5.1	10.
17-A007701	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007813	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007927	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007824	Nitrate	mg/l	0.102	0.093	9.2
17-A007824	Nitrite	mg/l	< 0.005	< 0.005	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
17-A007844	Total Organic Carbon	mg/l	0.89	5.9	5.0	100.20 %
17-A007848	Total Organic Carbon	mg/l	0.78	6.4	5.0	112.40 %
17-A007701	Chemical Oxygen Demand	mg/l	< 10	45.	50.	90.00 %
17-A007813	Chemical Oxygen Demand	mg/l	< 10	89.	100	89.00 %
17-A007927	Chemical Oxygen Demand	mg/l	< 10	86.	100	86.00 %
17-A007824	Nitrate	mg/l	0.102	4.93	5.00	96.56 %
17-A007824	Nitrite	mg/l	< 0.005	4.81	5.00	96.20 %
17-A007817	Total Sulfide	mg/l	< 0.05	0.54	0.50	108.00 %
17-A007817	Total Sulfide	mg/l	< 0.05	0.54	0.50	108.00 %

MATRIX SPIKE DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE + SPK	MSD VALUE	RPD
Spike	Total Sulfide	mg/l	0.54	0.54	0.00

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	200	100. %
Total Organic Carbon	mg/l	5.0	5.1	102. %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chemical Oxygen Demand	mg/l	100	110	110. %
Chloride	mg/l	5.00	5.11	102. %
Chloride	mg/l	5.00	4.88	97.6 %
Chloride	mg/l	5.00	4.87	97.4 %
Nitrate	mg/l	5.00	4.92	98.4 %
Nitrate	mg/l	5.00	4.96	99.2 %
Nitrite	mg/l	5.00	5.00	100. %
Nitrite	mg/l	5.00	5.00	100. %
Total Sulfide	mg/l	1.0	1.0	100. %
Sulfate	mg/l	5.00	5.26	105. %
Sulfate	mg/l	5.00	5.17	103. %

QC Summary for sample numbers: 17-A007810 to 17-A007813...

BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1
Sulfate	mg/l	< 0.1

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Page # 1 of 1

P8

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Amtest

PROJECT NAME/NO.	PO #
705461	E-647

REMARKS

Please Email Results

TURNAROUND TIME

☑ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

						ANALYSES REQUESTED										
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	~~Sulfide~~ VPH	Nitrate	Sulfate	~~Chloride~~ Alkalinity	~~TOC-9060M~~	COD	Nitrite	BOD	Notes
MW-1	7810	5/25/17	813	water	4			X	X	X	X	X	X	X	X	
MW-7	11	↓	906	↓	5			X	X	X	X	X	X	X	X	
MW-15	12	↓	1000	↓	5			X	X	X	X	X	X	X	X	
MW-9	13	↓	1121	↓	5			X	X	X	X	X	X	X	X	

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		~~Michael Erdahl~~ Eric Young	Friedman and Bruya	5/26/17	8:30
Received by:		A. STAAB T=11.0	AMTEST	5/26/17	10:30
Relinquished by:					
Received by:					

COURIER

705461

SAMPLE CHAIN OF CUSTODY

ME 05/25/17 VWS/ATY

Page # 1 of 1

Report To Eric Koltes/Josh Bernthal

Company EPI

Address 1180 NW Maple St

City, State, ZIP Issaquah, WA

Phone _____ Email _____

SAMPLERS (signature) [signature]

PROJECT NAME: 69402

PO #

REMARKS

INVOICE TO

TURNAROUND TIME
- ☒ Standard Turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	cVOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Total Fe + Mn	Dissolved Fe + Mn	Methane, ethane, ethene	TOC + COD	Nitrate/Nitrite	Sulfate + Chloride	BOD	Sulfide	Carbon Dioxide
MW-1	01A-0	5/25/17	813	Water	16					X			X	X	X	X	X	X	X	X	X
MW-7	02A-P		906		16					X			X	X	X	Y	X	X	X	X	X
MW-15	03A-P		1000		16					X			X	X	X	X	X	X	X	X	X
MW-9	04A-P		1121		16					X			X	X	X	X	X	X	X	X	X
																For Mn - per LWB					
																	5/23/17 mc				
														Samples received at 5 °C							

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Elizabeth D. Webber	EPI	5/25/17	1515
Received by: [signature]	DII VD -Bruya	FedEx	5-25-17	15.15
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 1, 2017

Eric Koltes, Project Manager
Environmental Partners, Inc.
1180 NW Maple St, Suite 310
Issaquah, WA 98027

RE: 69402, F&BI 705462

Dear Mr Koltes:

Included are the results from the testing of material submitted on May 25, 2017 from the 69402, F&BI 705462 project. There are 14 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Cynthia Moon, Josh Bernthal
EPI0601R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 25, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 705462 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
705462 -01	MW-4:Bag
705462 -02	MW-10:Bag
705462 -03	MW-11:Bag
705462 -04	MW-5:Bag
705462 -05	MW-14:Bag
705462 -06	MW-12:Bag
705462 -07	MW-6:Bag
705462 -08	MW-13:Bag
705462 -09	GW-10:Bag

All quality control requirements were acceptable.

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-4:Bag	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705462
Date Extracted:	05/26/17	Lab ID:	705462-01
Date Analyzed:	05/26/17	Data File:	052613.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	85	117
Toluene-d8	99	91	108
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	2.1
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	9.8
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-10:Bag	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705462
Date Extracted:	05/26/17	Lab ID:	705462-02
Date Analyzed:	05/26/17	Data File:	052618.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	102	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	3.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	16
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	1.3
Tetrachloroethene	2.0

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-11:Bag	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705462
Date Extracted:	05/26/17	Lab ID:	705462-03
Date Analyzed:	05/26/17	Data File:	052620.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	4.1
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	26
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-5:Bag	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705462
Date Extracted:	05/26/17	Lab ID:	705462-04
Date Analyzed:	05/26/17	Data File:	052630.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	1.5
Tetrachloroethene	51

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-14:Bag	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705462
Date Extracted:	05/26/17	Lab ID:	705462-05
Date Analyzed:	05/26/17	Data File:	052631.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-12:Bag	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705462
Date Extracted:	05/26/17	Lab ID:	705462-06
Date Analyzed:	05/26/17	Data File:	052621.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	98	91	108
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-6:Bag	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705462
Date Extracted:	05/26/17	Lab ID:	705462-07
Date Analyzed:	05/26/17	Data File:	052622.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-13:Bag	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705462
Date Extracted:	05/26/17	Lab ID:	705462-08
Date Analyzed:	05/26/17	Data File:	052623.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	3.0

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-10:Bag	Client:	Environmental Partners
Date Received:	05/25/17	Project:	69402, F&BI 705462
Date Extracted:	05/26/17	Lab ID:	705462-09
Date Analyzed:	05/26/17	Data File:	052624.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	85	117
Toluene-d8	99	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	18
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	1.9

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705462
Date Extracted:	05/26/17	Lab ID:	07-1043 mb
Date Analyzed:	05/26/17	Data File:	052609.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	103	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Date of Report: 06/01/17
Date Received: 05/25/17
Project: 69402, F&BI 705462

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 705453-02 1/100 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	<20	<20	nm
Chloroethane	ug/L (ppb)	<100	<100	nm
1,1-Dichloroethene	ug/L (ppb)	<100	<100	nm
Methylene chloride	ug/L (ppb)	<500	<500	nm
trans-1,2-Dichloroethene	ug/L (ppb)	<100	<100	nm
1,1-Dichloroethane	ug/L (ppb)	<100	<100	nm
cis-1,2-Dichloroethene	ug/L (ppb)	<100	<100	nm
1,2-Dichloroethane (EDC)	ug/L (ppb)	<100	<100	nm
1,1,1-Trichloroethane	ug/L (ppb)	<100	<100	nm
Trichloroethene	ug/L (ppb)	<100	<100	nm
Tetrachloroethene	ug/L (ppb)	<100	<100	nm

Laboratory Code: 705462-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	2.1	93	61-139
Chloroethane	ug/L (ppb)	50	<1	91	55-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	94	71-123
Methylene chloride	ug/L (ppb)	50	<5	98	61-126
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	96	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	94	79-113
cis-1,2-Dichloroethene	ug/L (ppb)	50	9.8	92	63-126
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	90	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	94	75-121
Trichloroethene	ug/L (ppb)	50	<1	85	73-122
Tetrachloroethene	ug/L (ppb)	50	<1	89	72-113

Date of Report: 06/01/17
Date Received: 05/25/17
Project: 69402, F&BI 705462

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	99	94	70-128	5
Chloroethane	ug/L (ppb)	50	96	91	66-149	5
1,1-Dichloroethene	ug/L (ppb)	50	98	97	75-119	1
Methylene chloride	ug/L (ppb)	50	106	103	63-132	3
trans-1,2-Dichloroethene	ug/L (ppb)	50	99	96	76-118	3
1,1-Dichloroethane	ug/L (ppb)	50	95	93	77-119	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	95	92	76-119	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	92	90	78-114	2
1,1,1-Trichloroethane	ug/L (ppb)	50	97	95	80-116	2
Trichloroethene	ug/L (ppb)	50	88	86	72-119	2
Tetrachloroethene	ug/L (ppb)	50	91	90	78-109	1

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

705462

SAMPLE CHAIN OF CUSTODY

ME 05-25-17

VWH

Page # 1 of

Report To Eric Koltes/Josh Bernthal

Company EPI

Address 1180 NW Maple St

City, State, ZIP Issaquah, WA

Phone Email

SAMPLERS (signature) E.D. M.Bye

PROJECT NAME 69402

PO #

REMARKS

INVOICE TO

TURNAROUND TIME
- Standard Turnaround
- RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- Dispose after 30 days
- Archive Samples
- Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	CVOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM					Notes
						ANALYSES REQUESTED											
MW-4: Bag	01 A-D	5/25	1247	W	4					X							
MW-10 Bag	02		1258		4					X							
MW-11 Bag	03		1305		4					X							
MW-5: Bag	04		1319		4					X							
MW-14 Bag	05		1330		4					X							
MW-12: Bag	06		1349		4					X							
MW-6: Bag	07		1357		4					X							
MW-13: Bag	08		1407		4					X							
GW-10: Bag	09		1413		4					X							Samples received at 5 °C

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	E.D. M.Bye	Elizabeth Webbel-Bruya	EPI	5/25/17	1525
Received by:	Dou	DOUG	F&BE	5-25-17	15.25
Relinquished by:					
Received by:					

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

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fbi@isomedia.com
www.friedmanandbruya.com

June 13, 2017

Eric Koltes, Project Manager
Environmental Partners, Inc.
1180 NW Maple St, Suite 310
Issaquah, WA 98027

RE: 69402, F&BI 705475

Dear Mr Koltes:

Included are the results from the testing of material submitted on May 26, 2017 from the 69402, F&BI 705475 project. There are 14 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Cynthia Moon, Josh Bernthal
EPI0613R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on May 26, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 705475 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
705475 -01	GW-4

Sample GW-4 was sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the sample was sent to Fremont for carbon dioxide analysis. The reports are included.

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	GW-4	Client:	Environmental Partners
Date Received:	05/26/17	Project:	69402, F&BI 705475
Date Extracted:	05/30/17	Lab ID:	705475-01
Date Analyzed:	05/30/17	Data File:	705475-01.082
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	73.3
Manganese	118

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705475
Date Extracted:	05/30/17	Lab ID:	I7-294 mb
Date Analyzed:	05/30/17	Data File:	I7-294 mb.079
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	GW-4	Client:	Environmental Partners
Date Received:	05/26/17	Project:	69402, F&BI 705475
Date Extracted:	05/30/17	Lab ID:	705475-01
Date Analyzed:	05/30/17	Data File:	705475-01.086
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	1.81

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705475
Date Extracted:	05/30/17	Lab ID:	I7-295 mb
Date Analyzed:	05/30/17	Data File:	I7-295 mb.062
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-4	Client:	Environmental Partners
Date Received:	05/26/17	Project:	69402, F&BI 705475
Date Extracted:	05/26/17	Lab ID:	705475-01
Date Analyzed:	05/26/17	Data File:	052617.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	105	63	127
4-Bromofluorobenzene	98	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	4.1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705475
Date Extracted:	05/26/17	Lab ID:	07-1044 mb
Date Analyzed:	05/26/17	Data File:	052609.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	99	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	GW-4	Client:	Environmental Partners
Date Received:	05/26/17	Project:	69402, F&BI 705475
Date Extracted:	05/30/17	Lab ID:	705475-01
Date Analyzed:	05/30/17	Data File:	013F1301.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705475
Date Extracted:	05/30/17	Lab ID:	07-1154 mb
Date Analyzed:	05/30/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Date of Report: 06/13/17
Date Received: 05/26/17
Project: 69402, F&BI 705475

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 705475-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	73.3	97 b	121 b	70-130	22 b
Manganese	ug/L (ppb)	20	118	70 b	139 b	70-130	66 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	105	85-115
Manganese	ug/L (ppb)	20	113	85-115

Date of Report: 06/13/17
Date Received: 05/26/17
Project: 69402, F&BI 705475

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 705461-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	1,880	101 b	183 b	70-130	58 b
Manganese	ug/L (ppb)	20	3,820	0 b	1200 b	70-130	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	100	85-115
Manganese	ug/L (ppb)	20	112	85-115

Date of Report: 06/13/17
Date Received: 05/26/17
Project: 69402, F&BI 705475

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 705475-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	<0.2	84	36-166
Chloroethane	ug/L (ppb)	50	<1	98	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	97	60-136
Methylene chloride	ug/L (ppb)	50	<5	96	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	95	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	89	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	92	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	95	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	96	60-146
Trichloroethene	ug/L (ppb)	50	<1	92	66-135
Tetrachloroethene	ug/L (ppb)	50	4.1	90	10-226

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	87	83	50-154	5
Chloroethane	ug/L (ppb)	50	99	97	58-146	2
1,1-Dichloroethene	ug/L (ppb)	50	95	96	67-136	1
Methylene chloride	ug/L (ppb)	50	91	88	39-148	3
trans-1,2-Dichloroethene	ug/L (ppb)	50	94	94	68-128	0
1,1-Dichloroethane	ug/L (ppb)	50	89	87	79-121	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	91	91	80-123	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	96	93	73-132	3
1,1,1-Trichloroethane	ug/L (ppb)	50	99	95	83-130	4
Trichloroethene	ug/L (ppb)	50	92	90	80-120	2
Tetrachloroethene	ug/L (ppb)	50	93	89	76-121	4

Date of Report: 06/13/17
Date Received: 05/26/17
Project: 69402, F&BI 705475

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Laboratory Code: 705461-04 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methane	ug/L (ppb)	<5	<5	nm
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methane	ug/L (ppb)	59	79	79	50-150	0
Ethane	ug/L (ppb)	110	70	70	50-150	0
Ethene	ug/L (ppb)	102	94	94	50-150	0

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 705475
Work Order Number: 1705337

June 02, 2017

Attention Michael Erdahl:

Fremont Analytical, Inc. received 1 sample(s) on 5/30/2017 for the analyses presented in the following report.

Total Alkalinity by SM 2320B

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

Date: *06/02/2017*

CLIENT: Friedman & Bruya
Project: 705475
Work Order: 1705337

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1705337-001	GW-4	05/28/2017 7:12 AM	05/30/2017 1:04 PM

Case Narrative

WO#: **1705337**
Date: **6/2/2017**

CLIENT: Friedman & Bruya
Project: 705475

WorkOrder Narrative:
I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1705337**
Date Reported: **6/2/2017**

Client: Friedman & Bruya
Project: 705475
Lab ID: 1705337-001
Client Sample ID: **GW-4**

Collection Date: 5/28/2017 7:12:00 AM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B				Batch ID: R36524		Analyst: MW
Carbon dioxide	135	5.00		mg/L	1	6/1/2017 12:20:00 PM

Work Order: 1705337
CLIENT: Friedman & Bruya
Project: 705475

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID	**MB-R36524**	SampType:	**MBLK**		Units:	**mg/L**	Prep Date:	**6/1/2017**	RunNo:	**36524**	
Client ID:	**MBLKW**	Batch ID:	**R36524**				Analysis Date:	**6/1/2017**	SeqNo:	**700651**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID	**LCS-R36524**	SampType:	**LCS**		Units:	**mg/L**	Prep Date:	**6/1/2017**	RunNo:	**36524**	
Client ID:	**LCSW**	Batch ID:	**R36524**				Analysis Date:	**6/1/2017**	SeqNo:	**700652**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	113	2.50	100.0	0	113	80	120				

Sample ID	**1705343-001FDUP**	SampType:	**DUP**		Units:	**mg/L**	Prep Date:	**6/1/2017**	RunNo:	**36524**	
Client ID:	**BATCH**	Batch ID:	**R36524**				Analysis Date:	**6/1/2017**	SeqNo:	**700654**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	2,520	2.50						2,572	2.06	20	

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1705337**
Logged by:	**Erica Silva**	Date Received:	**5/30/2017 1:04:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☐	No ☑	NA ☐
	Sample received at appropriate temperature			
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☑	Not Required ☐
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☐	No ☑	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☑	NA ☐
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample	6.1

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

1705337

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Page # 1 of 1

Page 8 of 8

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont

PROJECT NAME/NO.	PO #
705475	E-653

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	Dissolved CO2			Notes
GW-4		5/28/17	0712	water	2								X			

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman and Bruya	5/30/17	11:00AM
Received by:				5/30/17	1304
Relinquished by:					
Received by:					

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jun 9 2017
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
GW-4	Water	17-A007817	DEM, MIN, NUT, CONV

Your sample was received on Friday, May 26, 2017. At the time of receipt, the sample was logged in and properly maintained prior to the subsequent analysis.

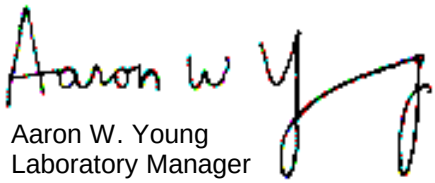
The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,



Aaron W. Young
Laboratory Manager

Project #: 705475
PO Number: E-650

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL
Project #: 705475
PO Number: E-650
All results reported on an as received basis.

Date Received: 05/26/17
Date Reported: 6/ 9/17

AMTEST Identification Number **17-A007817**
Client Identification **GW-4**
Sampling Date **05/26/17, 07:12**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	05/30/17

Demand

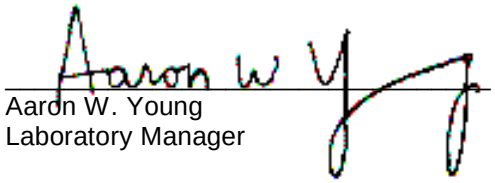
PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	JM	05/26/17
Total Organic Carbon	0.60	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	8.10	mg/l		0.05	EPA 300.0	JC	05/26/17
Sulfate	6.00	mg/l		0.1	EPA 300.0	JC	05/26/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/26/17
Nitrate	0.599	mg/l		0.025	EPA 300.0	JC	05/26/17



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample number: 17-A007817

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A007796	BOD	mg/l	4.6	5.1	10.
17-A007701	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007813	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007927	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007824	Nitrate	mg/l	0.102	0.093	9.2
17-A007824	Nitrite	mg/l	< 0.005	< 0.005	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
17-A007844	Total Organic Carbon	mg/l	0.89	5.9	5.0	100.20 %
17-A007848	Total Organic Carbon	mg/l	0.78	6.4	5.0	112.40 %
17-A007701	Chemical Oxygen Demand	mg/l	< 10	45.	50.	90.00 %
17-A007813	Chemical Oxygen Demand	mg/l	< 10	89.	100	89.00 %
17-A007927	Chemical Oxygen Demand	mg/l	< 10	86.	100	86.00 %
17-A007824	Nitrate	mg/l	0.102	4.93	5.00	96.56 %
17-A007824	Nitrite	mg/l	< 0.005	4.81	5.00	96.20 %
17-A007817	Total Sulfide	mg/l	< 0.05	0.54	0.50	108.00 %
17-A007817	Total Sulfide	mg/l	< 0.05	0.54	0.50	108.00 %

MATRIX SPIKE DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE + SPK	MSD VALUE	RPD
Spike	Total Sulfide	mg/l	0.54	0.54	0.00

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	200	100. %
Total Organic Carbon	mg/l	5.0	5.1	102. %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chemical Oxygen Demand	mg/l	100	110	110. %
Chloride	mg/l	5.00	5.11	102. %
Nitrate	mg/l	5.00	4.92	98.4 %
Nitrate	mg/l	5.00	4.96	99.2 %
Nitrite	mg/l	5.00	5.00	100. %
Nitrite	mg/l	5.00	5.00	100. %
Total Sulfide	mg/l	1.0	1.0	100. %
Sulfate	mg/l	5.00	5.26	105. %

QC Summary for sample number: 17-A007817...

BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Page # 1 of 1

P.6

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Am Test

PROJECT NAME/NO.	PO #
705475	E-650

REMARKS

Please Email Results

TURNAROUND TIME

☑ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	Sulfide ~~VPH~~	Nitrate	Sulfate	Chloride ~~Alkalinity~~	TOC ~~9060M~~	COD	Nitrite	BOD	Notes
GW-4	7817	5/26/17	712	W	5			X	X	X	X	X	X	X	X	125°

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	~~Michael Erdahl~~ Matt Langston	Friedman and Bruya	5/26/17	1100
Received by:		MJ	5/26/17	1200
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

705475

SAMPLE CHAIN OF CUSTODY

ME 05-26-17

VW2 / AI3

Page # 1 of 1

Report To Josh Bernthal / Eric Kolles

Company Environmental Partners Inc

Address 1180 NW Maple St

City, State, ZIP Issaquah, WA

Phone _____ Email _____

SAMPLERS (*signature*) E. M. Bruya

PROJECT NAME: 69402

PO #:

REMARKS:

INVOICE TO:

TURNAROUND TIME
- ☒ Standard Turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	cVOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Total Fe	Dissolved Fe	Methane, ethane, ethene	TOC, COD	Nitrate, Nitrite	Sulfate, Chloride	BOD	Sulfide	Carbon Dioxide
						ANALYSES REQUESTED													Notes		
GW-4	01A-P	5/26/17	712	Water	16					X			X	X	X	X	X	X	X	X	X
																	Mn per LWB 5/27/17 mk				

Samples received at 4

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: E. M. Bruya	Elizabeth Webber Bruya	EPI	5/26/17	945
Received by:	DO VO	FedEx	5-26-17	9-45
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 1, 2017

Eric Koltes, Project Manager
Environmental Partners, Inc.
1180 NW Maple St, Suite 310
Issaquah, WA 98027

RE: 69402, F&BI 705476

Dear Mr Koltes:

Included are the results from the testing of material submitted on May 26, 2017 from the 69402, F&BI 705476 project. There are 11 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Cynthia Moon, Josh Bernthal
EPI0601R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 26, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 705476 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
705476 -01	GW-1:Bag
705476 -02	GW-7:Bag
705476 -03	GW-8:Bag
705476 -04	GW-9:Bag
705476 -05	GW-5:Bag
705476 -06	GW-6:Bag
705476 -07	GW-3:Bag

All quality control requirements were acceptable.

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-1:Bag	Client:	Environmental Partners
Date Received:	05/26/17	Project:	69402, F&BI 705476
Date Extracted:	05/30/17	Lab ID:	705476-01
Date Analyzed:	05/30/17	Data File:	053009.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	85	117
Toluene-d8	99	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-7:Bag	Client:	Environmental Partners
Date Received:	05/26/17	Project:	69402, F&BI 705476
Date Extracted:	05/30/17	Lab ID:	705476-02
Date Analyzed:	05/30/17	Data File:	053010.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	99	91	108
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	1.0

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-8:Bag	Client:	Environmental Partners
Date Received:	05/26/17	Project:	69402, F&BI 705476
Date Extracted:	05/30/17	Lab ID:	705476-03
Date Analyzed:	05/30/17	Data File:	053011.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	102	91	108
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	14

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-9:Bag	Client:	Environmental Partners
Date Received:	05/26/17	Project:	69402, F&BI 705476
Date Extracted:	05/30/17	Lab ID:	705476-04
Date Analyzed:	05/30/17	Data File:	053012.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	1.1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-5:Bag	Client:	Environmental Partners
Date Received:	05/26/17	Project:	69402, F&BI 705476
Date Extracted:	05/30/17	Lab ID:	705476-05
Date Analyzed:	05/30/17	Data File:	053013.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	99	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	2.3

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-6:Bag	Client:	Environmental Partners
Date Received:	05/26/17	Project:	69402, F&BI 705476
Date Extracted:	05/30/17	Lab ID:	705476-06
Date Analyzed:	05/30/17	Data File:	053014.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	5.6

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	GW-3:Bag	Client:	Environmental Partners
Date Received:	05/26/17	Project:	69402, F&BI 705476
Date Extracted:	05/30/17	Lab ID:	705476-07
Date Analyzed:	05/30/17	Data File:	053015.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705476
Date Extracted:	05/30/17	Lab ID:	07-1049 mb
Date Analyzed:	05/30/17	Data File:	053008.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	99	91	108
4-Bromofluorobenzene	97	76	126

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Date of Report: 06/01/17
Date Received: 05/26/17
Project: 69402, F&BI 705476

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 705476-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	<0.2	99	61-139
Chloroethane	ug/L (ppb)	50	<1	97	55-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	101	71-123
Methylene chloride	ug/L (ppb)	50	<5	102	61-126
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	100	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	97	79-113
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	96	63-126
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	96	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	99	75-121
Trichloroethene	ug/L (ppb)	50	<1	91	73-122
Tetrachloroethene	ug/L (ppb)	50	<1	91	72-113

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	96	96	70-128	0
Chloroethane	ug/L (ppb)	50	93	96	66-149	3
1,1-Dichloroethene	ug/L (ppb)	50	99	100	75-119	1
Methylene chloride	ug/L (ppb)	50	93	94	63-132	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	97	98	76-118	1
1,1-Dichloroethane	ug/L (ppb)	50	93	95	77-119	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	94	94	76-119	0
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	94	94	78-114	0
1,1,1-Trichloroethane	ug/L (ppb)	50	95	97	80-116	2
Trichloroethene	ug/L (ppb)	50	90	90	72-119	0
Tetrachloroethene	ug/L (ppb)	50	91	91	78-109	0

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

705476

SAMPLE CHAIN OF CUSTODY

ME 05-26-17 VW2

Report To Eric Koltes/Josh Bernthal

Company EPI

Address 1180 NW Maple St

City, State, ZIP Issaquah WA

Phone ________ Email ________

SAMPLERS (signature) [signature]

PROJECT NAME 69402

PO #

REMARKS

INVOICE TO

Page # 1 of 1

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH ________
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Archive Samples
☐ Other ________

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM					Notes
GW-1:Bag	01 A-D	5/26/17	6:06	Water	4					X							
GW-7:Bag	02	↓	6:20	↓	↓					X							
GW-8:Bag	03		6:28							X							
GW-9:Bag	04		6:34							X							
GW-5:Bag	05		7:03							X							
GW-6:Bag	06		7:45							X							
GW-3:Bag	07		7:54							X							

Samples received at 4 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Elizabeth Webber-Brys	EPI	5/26/17	945
Received by: [signature]	D D V8	F&BI	5-26-17	9:41
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

June 13, 2017

Eric Koltes, Project Manager
Environmental Partners, Inc.
1180 NW Maple St, Suite 310
Issaquah, WA 98027

RE: 69402, F&BI 705507

Dear Mr Koltes:

Included are the results from the testing of material submitted on May 30, 2017 from the 69402, F&BI 705507 project. There are 19 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Cynthia Moon, Josh Bernthal
EPI0613R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 30, 2017 by Friedman & Bruya, Inc. from the Environmental Partners 69402, F&BI 705507 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Environmental Partners
705507 -01	MW-3
705507 -02	MW-2

The samples were sent to Amtest for TOC, chloride, sulfate, sulfide, nitrate, nitrite, BOD, and COD analyses. In addition, the samples were sent to Fremont for carbon dioxide analysis. The reports are included.

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-3	Client:	Environmental Partners
Date Received:	05/30/17	Project:	69402, F&BI 705507
Date Extracted:	05/31/17	Lab ID:	705507-01 x10
Date Analyzed:	05/31/17	Data File:	705507-01 x10.057
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	30,200
Manganese	4,490

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-2	Client:	Environmental Partners
Date Received:	05/30/17	Project:	69402, F&BI 705507
Date Extracted:	05/31/17	Lab ID:	705507-02
Date Analyzed:	05/31/17	Data File:	705507-02.051
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	59.6
Manganese	4.30

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705507
Date Extracted:	05/31/17	Lab ID:	I7-294 mb2
Date Analyzed:	05/31/17	Data File:	I7-294 mb2.043
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-3	Client:	Environmental Partners
Date Received:	05/30/17	Project:	69402, F&BI 705507
Date Extracted:	05/31/17	Lab ID:	705507-01 x10
Date Analyzed:	05/31/17	Data File:	705507-01 x10.056
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	28,100
Manganese	4,530

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-2	Client:	Environmental Partners
Date Received:	05/30/17	Project:	69402, F&BI 705507
Date Extracted:	05/31/17	Lab ID:	705507-02
Date Analyzed:	05/31/17	Data File:	705507-02.053
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	3.76

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705507
Date Extracted:	05/31/17	Lab ID:	I7-295 mb2
Date Analyzed:	05/31/17	Data File:	I7-295 mb2.042
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50
Manganese	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-3	Client:	Environmental Partners
Date Received:	05/30/17	Project:	69402, F&BI 705507
Date Extracted:	06/01/17	Lab ID:	705507-01
Date Analyzed:	06/01/17	Data File:	060109.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	100	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	9.4
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	2.1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-2	Client:	Environmental Partners
Date Received:	05/30/17	Project:	69402, F&BI 705507
Date Extracted:	06/01/17	Lab ID:	705507-02
Date Analyzed:	06/01/17	Data File:	060110.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	103	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705507
Date Extracted:	06/01/17	Lab ID:	07-1157 mb
Date Analyzed:	06/01/17	Data File:	060107.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	101	63	127
4-Bromofluorobenzene	104	60	133

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-3	Client:	Environmental Partners
Date Received:	05/30/17	Project:	69402, F&BI 705507
Date Extracted:	06/01/17	Lab ID:	705507-01
Date Analyzed:	06/01/17	Data File:	007F0701.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	3,300 ve
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-3	Client:	Environmental Partners
Date Received:	05/30/17	Project:	69402, F&BI 705507
Date Extracted:	06/01/17	Lab ID:	705507-01 1/10
Date Analyzed:	06/01/17	Data File:	006F0601.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	3,300
Ethane	<100
Ethene	<100

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	MW-2	Client:	Environmental Partners
Date Received:	05/30/17	Project:	69402, F&BI 705507
Date Extracted:	06/01/17	Lab ID:	705507-02
Date Analyzed:	06/01/17	Data File:	008F0801.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Analysis For Dissolved Gasses By RSK 175

Client Sample ID:	Method Blank	Client:	Environmental Partners
Date Received:	Not Applicable	Project:	69402, F&BI 705507
Date Extracted:	06/01/17	Lab ID:	07-1158 mb
Date Analyzed:	06/01/17	Data File:	005F0501.D
Matrix:	Water	Instrument:	GC8
Units:	ug/L (ppb)	Operator:	JS

Compounds:	Concentration ug/L (ppb)
Methane	<5
Ethane	<10
Ethene	<10

Date of Report: 06/13/17
Date Received: 05/30/17
Project: 69402, F&BI 705507

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 705475-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	73.3	97 b	121 b	70-130	22 b
Manganese	ug/L (ppb)	20	118	70 b	139 b	70-130	66 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	105	85-115
Manganese	ug/L (ppb)	20	113	85-115

Date of Report: 06/13/17
Date Received: 05/30/17
Project: 69402, F&BI 705507

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 705461-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	1,880	101 b	183 b	70-130	58 b
Manganese	ug/L (ppb)	20	3,820	0 b	1200 b	70-130	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	100	85-115
Manganese	ug/L (ppb)	20	112	85-115

Date of Report: 06/13/17
Date Received: 05/30/17
Project: 69402, F&BI 705507

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 705507-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	<0.2	100	36-166
Chloroethane	ug/L (ppb)	50	<1	103	46-160
1,1-Dichloroethene	ug/L (ppb)	50	<1	99	60-136
Methylene chloride	ug/L (ppb)	50	<5	96	67-132
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	101	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	97	70-128
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	99	71-127
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	97	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	99	60-146
Trichloroethene	ug/L (ppb)	50	<1	96	66-135
Tetrachloroethene	ug/L (ppb)	50	<1	95	10-226

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	106	105	50-154	1
Chloroethane	ug/L (ppb)	50	110	107	58-146	3
1,1-Dichloroethene	ug/L (ppb)	50	106	101	67-136	5
Methylene chloride	ug/L (ppb)	50	106	98	39-148	8
trans-1,2-Dichloroethene	ug/L (ppb)	50	108	102	68-128	6
1,1-Dichloroethane	ug/L (ppb)	50	103	98	79-121	5
cis-1,2-Dichloroethene	ug/L (ppb)	50	105	99	80-123	6
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	104	99	73-132	5
1,1,1-Trichloroethane	ug/L (ppb)	50	105	101	83-130	4
Trichloroethene	ug/L (ppb)	50	103	98	80-120	5
Tetrachloroethene	ug/L (ppb)	50	102	97	76-121	5

Date of Report: 06/13/17
Date Received: 05/30/17
Project: 69402, F&BI 705507

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED GASSES USING METHOD RSK 175

Laboratory Code: 706013-05 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methane	ug/L (ppb)	25	22	13
Ethane	ug/L (ppb)	<10	<10	nm
Ethene	ug/L (ppb)	<10	<10	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methane	ug/L (ppb)	59	79	77	50-150	3
Ethane	ug/L (ppb)	110	71	71	50-150	0
Ethene	ug/L (ppb)	102	95	93	50-150	2

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 705507
Work Order Number: 1705351

June 02, 2017

Attention Michael Erdahl:

Fremont Analytical, Inc. received 2 sample(s) on 5/31/2017 for the analyses presented in the following report.

Total Alkalinity by SM 2320B

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

Date: *06/02/2017*

CLIENT: Friedman & Bruya
Project: 705507
Work Order: 1705351

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1705351-001	MW-3	05/30/2017 12:07 PM	05/31/2017 10:19 AM
1705351-002	MW-2	05/30/2017 1:27 PM	05/31/2017 10:19 AM

Case Narrative

WO#: **1705351**
Date: **6/2/2017**

CLIENT: Friedman & Bruya
Project: 705507

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1705351**
Date Reported: **6/2/2017**

CLIENT: Friedman & Bruya
Project: 705507

Lab ID: 1705351-001 **Collection Date:** 5/30/2017 12:07:00 PM
Client Sample ID: **MW-3** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B				Batch ID: R36524		Analyst: MW
Carbon dioxide	445	5.00		mg/L	1	6/1/2017 12:25:00 PM

Lab ID: 1705351-002 **Collection Date:** 5/30/2017 1:27:00 PM
Client Sample ID: **MW-2** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Alkalinity by SM 2320B				Batch ID: R36524		Analyst: MW
Carbon dioxide	35.1	5.00		mg/L	1	6/1/2017 12:30:00 PM

Work Order: 1705351
CLIENT: Friedman & Bruya
Project: 705507

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID	**MB-R36524**	SampType:	**MBLK**		Units:	**mg/L**	Prep Date:	**6/1/2017**	RunNo:	**36524**
Client ID:	**MBLKW**	Batch ID:	**R36524**				Analysis Date:	**6/1/2017**	SeqNo:	**700651**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID	**LCS-R36524**	SampType:	**LCS**		Units:	**mg/L**	Prep Date:	**6/1/2017**	RunNo:	**36524**
Client ID:	**LCSW**	Batch ID:	**R36524**				Analysis Date:	**6/1/2017**	SeqNo:	**700652**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	113	2.50	100.0	0	113	80	120				

Sample ID	**1705343-001FDUP**	SampType:	**DUP**		Units:	**mg/L**	Prep Date:	**6/1/2017**	RunNo:	**36524**
Client ID:	**BATCH**	Batch ID:	**R36524**				Analysis Date:	**6/1/2017**	SeqNo:	**700654**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	2,520	5.00						2,572	2.06	20	
Alkalinity, Carbonate (As CaCO3)	ND	5.00						0		20	
Alkalinity, Hydroxide (As CaCO3)	ND	5.00						0		20	
Alkalinity, Total (As CaCO3)	2,520	2.50						2,572	2.06	20	

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1705351**
Logged by:	**Erica Silva**	Date Received:	**5/31/2017 10:19:00 AM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☐	No ☑	NA ☐
		No cooler present		
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample	2.5

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

1705351

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont

PROJECT NAME/NO.	PO #
705507	E-653

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	CO_2			Notes
MW-3		5/30/17	1207	water									X			
MW-2		↓	1327	↓									X			

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman and Bruya	5/31/17	09:00AM
Received by:		Brianna Barnes	FAI	5/31/17	1019
Relinquished by:					
Received by:					

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jun 9 2017
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL

Dear MICHAEL ERDAHL:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-3	Water	17-A007927	DEM, MIN, NUT, CONV
MW-2	Water	17-A007928	DEM, MIN, NUT, CONV

Your samples were received on Wednesday, May 31, 2017. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 705507
PO Number: E-657

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Attention: MICHAEL ERDAHL
Project #: 705507
PO Number: E-657
All results reported on an as received basis.

Date Received: 05/31/17
Date Reported: 6/ 9/17

AMTEST Identification Number **17-A007927**
Client Identification **MW-3**
Sampling Date **05/30/17, 12:07**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	06/05/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	< 2	mg/l		2	SM 5210B	NG	06/01/17
Total Organic Carbon	9.3	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	< 10	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	4.10	mg/l		0.05	EPA 300.0	JC	05/31/17
Sulfate	22.4	mg/l		0.1	EPA 300.0	JC	06/01/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/31/17
Nitrate	7.70	mg/l		0.025	EPA 300.0	JC	05/31/17

AMTEST Identification Number **17-A007928**
Client Identification **MW-2**
Sampling Date **05/30/17, 13:27**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Sulfide	< 0.05	mg/l		0.05	SM 4500-S2-D	SW	06/05/17

Demand

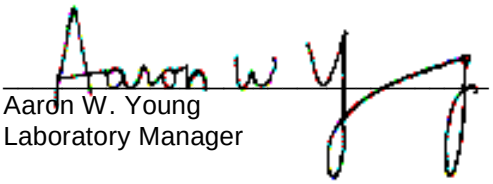
PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	98.	mg/l		2	SM 5210B	NG	06/01/17
Total Organic Carbon	72.	mg/l		0.5	SM 5310B	SW	06/06/17
Chemical Oxygen Demand	270	mg/l		10	EPA 410.4	SW	06/02/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloride	27.3	mg/l		0.05	EPA 300.0	JC	06/01/17
Sulfate	0.77	mg/l		0.1	EPA 300.0	JC	05/31/17

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Nitrite	< 0.005	mg/l		0.005	EPA 300.0	JC	05/31/17
Nitrate	< 0.025	mg/l		0.025	EPA 300.0	JC	05/31/17



Aaron W. Young
Laboratory Manager

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 17-A007927 to 17-A007928

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
17-A007923	BOD	mg/l	160	150	6.5
17-A007701	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007813	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007927	Chemical Oxygen Demand	mg/l	< 10	< 10	
17-A007930	Nitrate	mg/l	0.627	0.610	2.7
17-A007930	Nitrite	mg/l	< 0.005	< 0.005	

MATRIX SPIKES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	SMPL+ SPK	SPK AMT	RECOVERY
17-A007844	Total Organic Carbon	mg/l	0.89	5.9	5.0	100.20 %
17-A007848	Total Organic Carbon	mg/l	0.78	6.4	5.0	112.40 %
17-A007701	Chemical Oxygen Demand	mg/l	< 10	45.	50.	90.00 %
17-A007813	Chemical Oxygen Demand	mg/l	< 10	89.	100	89.00 %
17-A007927	Chemical Oxygen Demand	mg/l	< 10	86.	100	86.00 %
17-A007930	Nitrate	mg/l	0.627	2.75	2.00	106.15 %
17-A007930	Nitrite	mg/l	< 0.005	1.83	2.00	91.50 %
17-A008102	Total Sulfide	mg/l	< 0.05	0.53	0.50	106.00 %
17-A008102	Total Sulfide	mg/l	< 0.05	0.56	0.50	112.00 %

MATRIX SPIKE DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE + SPK	MSD VALUE	RPD
Spike	Total Sulfide	mg/l	0.53	0.56	5.5

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
BOD	mg/l	200	180	90.0 %
Total Organic Carbon	mg/l	5.0	5.1	102. %
Chemical Oxygen Demand	mg/l	100	100	100. %
Chemical Oxygen Demand	mg/l	100	110	110. %
Chloride	mg/l	5.00	5.20	104. %
Chloride	mg/l	5.00	4.88	97.6 %
Nitrate	mg/l	5.00	4.97	99.4 %
Nitrite	mg/l	5.00	5.00	100. %
Total Sulfide	mg/l	1.0	0.99	99.0 %
Sulfate	mg/l	5.00	5.45	109. %
Sulfate	mg/l	5.00	5.17	103. %

QC Summary for sample numbers: 17-A007927 to 17-A007928...

BLANKS

ANALYTE	UNITS	RESULT
BOD	mg/l	< 2
Total Organic Carbon	mg/l	< 0.5
Chemical Oxygen Demand	mg/l	< 10
Chemical Oxygen Demand	mg/l	< 10
Chloride	mg/l	0.07
Chloride	mg/l	< 0.05
Nitrate	mg/l	< 0.025
Nitrite	mg/l	< 0.005
Total Sulfide	mg/l	< 0.05
Sulfate	mg/l	< 0.1
Sulfate	mg/l	< 0.1

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

P.9

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Amtest

PROJECT NAME/NO.	PO #
705507	E-657

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	Sulfide VPH	Nitrate	Sulfate	Chloride Alkalinity	TOC-9060M	COD	Nitrite	BOD	Notes
MW-3	7927	5/30/17	1207	W	5			X	X	X	X	X	X	X	X	16.8'
MW-2	28	↓	1327	↓	5			X	X	X	X	X	X	X	X	

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman and Bruya	5/31/17	09:00AM.
Received by:		MJ	5/31/17	1125
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

Fedex

705507

SAMPLE CHAIN OF COUSTODY ME 05-30-17

AIY/UW3

Page # 1 of 1

Report To Josh Bernthal / Eric Koltes

Company EPI

Address 1180 NW Maple St

City, State, ZIP Issaquah, WA 98027

Phone ______ Email ______

SAMPLERS (signature) [signature]

PROJECT NAME 69402

PO #

REMARKS

INVOICE TO

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH ______
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Archive Samples
☐ Other ______

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Total Pb+Fe Mn	Dissolved Pb+Fe Mn	Dissolved methane, ethane, ethene	TOC + COD	Nitrate+Nitrite	Sulfate and Chloride	BOD	Sulfide	Carbon Dioxide
MW-3	01 A-P	5/30/17	1207	Water	16					X			X	X	X	X	X	X	X	X	X
MW-2	02 A-P	5/30/17	1327	Water	16					X			X	X	X	X	X	X	X	X	X

Samples received at 4 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Elizabeth Webber-Bruya	EPI	5/30/17	1450
Received by: [signature]	Jon Shimazu	FB&I	↓	↓
Relinquished by:				
Received by:				

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

LABORATORY REPORT

March 14, 2017

Mike Erdahl
Friedman & Bruya, Inc.
3012 16th Ave. W.
Seattle, WA 98119

RE: 702293

Dear Mike:

Enclosed are the results of the samples submitted to our laboratory on March 7, 2017. For your reference, these analyses have been assigned our service request number P1701103.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko
By Kate Kaneko at 3:57 pm, 03/14/17

For Sue Anderson
Project Manager

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: Friedman & Bruya, Inc. Service Request No: P1701103
Project: 702293

CASE NARRATIVE

The samples were received intact under chain of custody on March 7, 2017 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gas (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1177034
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-004
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-16-7
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA016272016-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Friedman & Bruya, Inc. Service Request: P1701103
Project ID: 702293

Date Received: 3/7/2017
Time Received: 10:25

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2
GW-11	P1701103-001	Water	2/20/2017	11:25	X
MW-3	P1701103-002	Water	2/20/2017	15:18	X

P1701103

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER ALS - Simi Valley

PROJECT NAME/NO.	PO #
702293	E-524

REMARKS

Please Email Results

Page # 1 of 1

TURNAROUND TIME

~~Standard (2 Weeks)~~

RUSH 1-week

Rush charges authorized by: MC

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	Dissolved CO_2			Notes
GW-11	01	2/20/17	1125	water	2								X			
MW-3	02	↓	1518	↓	2								X			

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman and Bruya	3/6/17	1120
Received by:		AL DAVIS	ALS	3/7/17	1025
Relinquished by:					
Received by:					

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

ALS Environmental
Sample Acceptance Check Form

Client: Friedman & Bruya, Inc. Work order: P1701103

Project: 702293

Sample(s) received on: 3/7/17 Date opened: 3/7/17 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: 4° C Blank Temperature: ° C **Gel Packs**			
8	Were **custody seals** on outside of cooler/Box/Container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1701103-001.01	40mL VOA NP		7		A	MC 3/09/2017
P1701103-001.02	40mL VOA NP				A	
P1701103-002.01	40mL VOA NP		7		A	MC 3/09/2017
P1701103-002.02	40mL VOA NP				A	

Explain any discrepancies: (include lab sample ID numbers): _____

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Friedman & Bruya, Inc.**
Client Project ID: **702293** ALS Project ID: P1701103

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD Date(s) Collected: 2/20/17
Analyst: Mike Conejo Date Received: 3/7/17
Matrix: Water Date Analyzed: 3/9/17
Test Notes:

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	MRL µg/L	Data Qualifier
GW-11	P1701103-001	0.10	**130,000**	1,000	
MW-3	P1701103-002	0.10	**130,000**	1,000	
Method Control Sample	P170309-MB	0.10	ND	1,000	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **Friedman & Bruya, Inc.**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P1701103
Client Project ID: **702293** ALS Sample ID: P170309-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Mike Conejo Date Analyzed: 3/09/17
Matrix: Water Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result$_1$ LCS ug/L	Result$_1$ DLCS ug/L	% Recovery LCS	% Recovery DLCS	ALS Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	20,300	19,900	**89**	**87**	62-123	2	20	

$_1$ = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

Attachment B
Bore Logs

ENVIRONMENTAL PARTNERS INC

BORING ID: DPT-1

SITE ADDRESS: **1419 Avenue D, Snohomish, Wa**	CLIENT: **Skotdal Real Estate**	CASING MATERIAL AND SIZE: **Temporary 2-Inch PVC**
DRILLING CONTRACTOR: **Steadfast**	PROJECT #: **69402.4**	SCREEN SIZE: **0.010-Inch Slot**
DRILLING EQUIPMENT: **Truck Mounted CME-55**	DATE: **6/27/17**	SCREEN INTERVAL: **10'-20' bgs**
DRILLING METHOD: **Hollow-Stem Auger**	GROUND SURFACE ELEV. FT AMSL:	FILTER PACK: **Native**
LOGGED BY: **C. McFadden** / BOREHOLE SIZE: **8-Inch**	TOTAL DEPTH: **20' bgs**	FILTER PACK INTERVAL: **N/A**

Depth (feet)	USCS	Description (USCS name; Color; Moisture; Density; Plasticity; Dilatency; EPI description; Other)	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)
0		Asphalt Surface				
2	ML	SANDY SILT WITH GRAVEL; gray; moist; medium plasticity; mostly silt with minor fine sand and minor gravel; no odor.				
4					DPT-1:5	0.1
6			33	9-50/2"		
8			2	50/6"		0.1
10			5	50/3"	DPT-1:10	0.1
12		Odor at 12.5' bgs	33	50/4"	DPT-1:12.5	67
14			1	50/3"	DPT-1:15	1.7
16						
18		Wet; no recovery at 17.5' bgs	0	60/2"		
20		End of Borehole	33	50/6"	DPT-1:20	0.4
22						
24						
26						

Well Construction: 2-Inch Temporary Well

NOTES:

ENVIRONMENTAL PARTNERS INC

BORING ID: DPT-2

SITE ADDRESS: **1419 Avenue D, Snohomish, Wa**	CLIENT: **Skotdal Real Estate**
DRILLING CONTRACTOR: **Steadfast**	PROJECT #: **69402.4**
DRILLING EQUIPMENT: **Truck Mounted CME-55**	DATE: **6/27/17**
DRILLING METHOD: **Hollow-Stem Auger**	GROUND SURFACE ELEV. FT AMSL:
LOGGED BY: **C. McFadden**	TOTAL DEPTH: **15' bgs**

DECOMMISSIONING MATERIAL: **Hydrated Bentonite**

BOREHOLE SIZE: **8-Inch**

Depth (feet)	USCS	Description (USCS name; Color; Moisture; Density; Plasticity; Dilatency; EPI description; Other)	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Comments
0		Gravel Surface					
2	ML	SANDY SILT; brown; damp; dense; low plasticity; mostly fine sand with some silt and trace gravel; no odor.					
4					DPT-2:5	0.1	
6			66	15-24-37			
8		No recovery	0	50/3"		0	
10		No recovery	0	35-50/6"		0	
12		Odor; auger flights moist with odor; softer drilling compared to DPT-1	66	50/6"	DPT-2:12.5	72	
14					DPT-2:15	3.5	
16		End of Borehole	33	60/6"			
18							
20							
22							
24							
26							

NOTES:

ENVIRONMENTAL PARTNERS INC

BORING ID: DPT-3

SITE ADDRESS **1419 Avenue D, Snohomish, Wa**	CLIENT: **Skotdal Real Estate**
DRILLING CONTRACTOR: **Steadfast**	PROJECT #: **69402.4**
DRILLING EQUIPMENT: **Truck Mounted CME-55**	DATE: **6/27/17**
DRILLING METHOD: **Hollow-Stem Auger**	GROUND SURFACE ELEV. FT AMSL: DECOMMISSIONING MATERIAL: **Hydrated Bentonite**
LOGGED BY: **C. McFadden**	TOTAL DEPTH: **15' bgs** BOREHOLE SIZE: **8-Inch**

Depth (feet)	USCS	Description USCS name; Color; Moisture; Density; Plasticity; Dilatency; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Comments
0		Asphalt Surface					
2							
4	ML	SANDY SILT WITH GRAVEL; gray; moist; medium plasticity; mostly silt with minor fine sand and minor gravel; no odor.					
6			66	09-15-27		0.3	
8							
10			66	27-50/6"	DPT-3:10	0.9	
12	ML	SANDY SILT; gray; moist; mostly silt with minor fine sand; no odor.	33	35-50/6"	DPT-3:12.5	1.7	
14			33	50/6"	DPT-3:15	0	
16							
18							
20							
22							
24							
26							

NOTES:

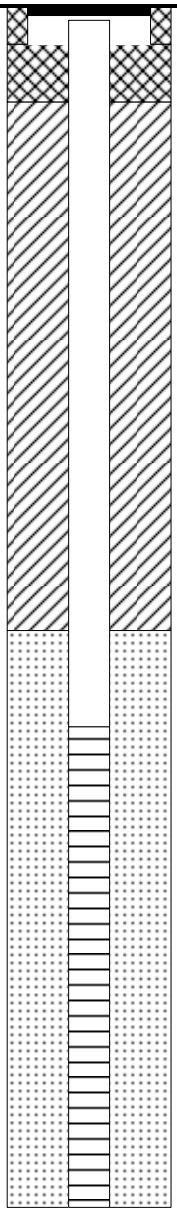
ENVIRONMENTAL PARTNERS INC

BORING ID: MW-16

SITE ADDRESS: **1419 Avenue D, Snohomish, Wa**	CLIENT: **Skotdal Real Estate**	CASING MATERIAL AND SIZE: **2-Inch PVC**
DRILLING CONTRACTOR: **Steadfast**	PROJECT #: **69402.4**	SCREEN SIZE: **0.010-Inch Slot**
DRILLING EQUIPMENT: **Truck Mounted CME-55**	DATE: **6/26/17**	SCREEN INTERVAL: **15'-25' bgs**
DRILLING METHOD: **Hollow-Stem Auger**	GROUND SURFACE ELEV. FT AMSL:	FILTER PACK: **Silica Sand**
LOGGED BY: **C. McFadden** / BOREHOLE SIZE: **8-Inch**	TOTAL DEPTH: **25' bgs**	FILTER PACK INTERVAL: **13'-25' bgs**

Depth (feet)	USCS	Description (USCS name; Color; Moisture; Density; Plasticity; Dilatency; EPI description; Other)	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)
0		Gravel Surface				
2	SM	SILTY SAND WITH GRAVEL; bluish gray; dry; dense; mostly fine sand; with some gravel and minor silt; no odor.				
4					MW-16:5	0
6			2	60/6"		
8	GW	WELL-GRADED GRAVEL; gray; damp; dense; mostly fine-coarse gravel with minor sand and trace silt; no odor.				
10					MW-16:10	0
12			33	42-50/6"		
14	GP	POORLY-GRADED GRAVEL; increased moisture; dense; limited recovery; no odor.				0
16			2	50/3"		
18	GW-GM	WELL-GRADED GRAVEL WITH SILT AND SAND; gray; wet; dense; mostly fine-coarse gravel with minor sand and minor silt; no odor.				
20					MW-16:20	0
22			33	65/6"		
24	SM	SILTY SAND; bluish gray; moist; dense; mostly fine sand with minor silt and trace gravel; no odor.				
26		End of Borehole	10	65/6"	MW-16:25	0

Well Construction



NOTES:

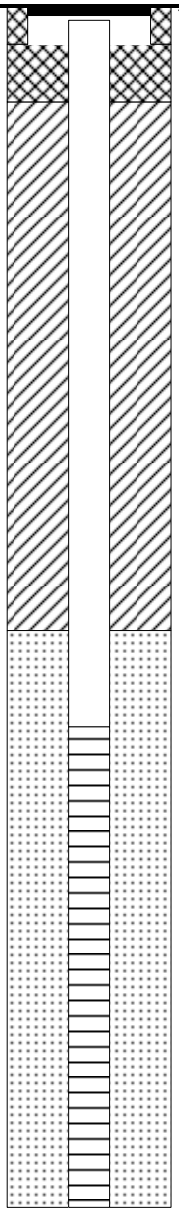
ENVIRONMENTAL PARTNERS INC

BORING ID: MW-17

SITE ADDRESS: **1419 Avenue D, Snohomish, Wa**	CLIENT: **Skotdal Real Estate**	CASING MATERIAL AND SIZE: **2-Inch PVC**
DRILLING CONTRACTOR: **Steadfast**	PROJECT #: **69402.4**	SCREEN SIZE: **0.010-Inch Slot**
DRILLING EQUIPMENT: **Truck Mounted CME-55**	DATE: **6/26/17**	SCREEN INTERVAL: **15'-25' bgs**
DRILLING METHOD: **Hollow-Stem Auger**	GROUND SURFACE ELEV. FT AMSL:	FILTER PACK: **Silica Sand**
LOGGED BY: **C. McFadden** / BOREHOLE SIZE: **8-Inch**	TOTAL DEPTH: **25' bgs**	FILTER PACK INTERVAL: **13'-25' bgs**

Depth (feet)	USCS	Description (USCS name; Color; Moisture; Density; Plasticity; Dilatency; EPI description; Other)	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)
0		Gravel Surface				
2						
4	SM	SILTY SAND; brown; damp; dense; mostly fine sand with minor silt and trace gravel; no odor.			MW-17:5	0.1
6			66	32-42-47		
8						
10		Rock in sampler; limitied recovery	1	25-50/6"	MW-17:10	0
12						
14						
16		Rock in sampler; limitied recovery; increased moisture to moist, soil very close to saturated	1	60/6"	MW-17:15	0
18	ML	SANDY SILT; brown; moist; dense; mostly silt with some fine sand and trace gravel; no odor.				
20		Wet auger flights from approximately 17' - 24' bgs	6	80/3"	MW-17:20	0
22						
24		Decreased moisture				
26		End of Borehole	3	60/3"	MW-17:25	0

Well Construction



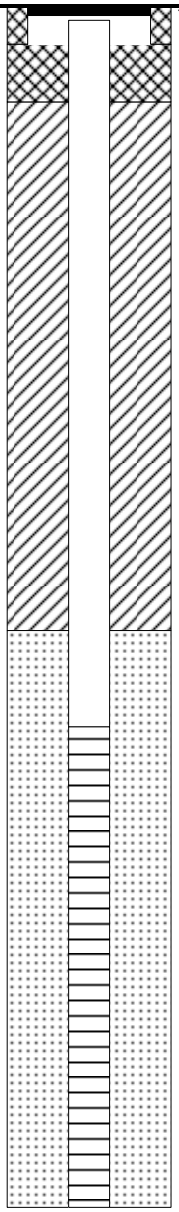
NOTES:

ENVIRONMENTAL PARTNERS INC

BORING ID: MW-18

SITE ADDRESS **1419 Avenue D, Snohomish, Wa**	CLIENT: **Skotdal Real Estate**	CASING MATERIAL AND SIZE: **2-Inch PVC**
DRILLING CONTRACTOR: **Steadfast**	PROJECT #: **69402.4**	SCREEN SIZE: **0.010-Inch Slot**
DRILLING EQUIPMENT: **Truck Mounted CME-55**	DATE: **6/27/17**	SCREEN INTERVAL: **15'-25' bgs**
DRILLING METHOD: **Hollow-Stem Auger**	GROUND SURFACE ELEV. FT AMSL:	FILTER PACK: **Silica Sand**
LOGGED BY: **C. McFadden** / BOREHOLE SIZE: **8-Inch**	TOTAL DEPTH: **25' bgs**	FILTER PACK INTERVAL: **13'-25' bgs**

Depth (feet)	USCS	Description USCS name; Color; Moisture; Density; Plasticity; Dilatency; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)
0		Gravel Surface				
2						
4	ML	SANDY SILT; brown; damp; dense; low plasticity; mostly fine sand with some silt and trace gravel; no odor.			MW-18:5	0.1
6			66	11-15-27		
8						
10					MW-18:10	0
12			66	31-50/3"		
14						
16		Increased moisture to moist; increased gravel content to few; limited recovery in sampler at 15' bgs; wet auger flights 15'-20' bgs			MW-18:15	0.1
18			2	100/5"		
20					MW-18:20	0.1
22			33	50/6"		
24		Decreased moisture				
26		End of Borehole			MW-18:25	0
			10	50/6"		



NOTES: