INTERIM CLEANUP ACTION CONSTRUCTION AND DESIGN REPORT

Morrell's Dry Cleaners

Prepared for: David Shaw, Successor to Walker Chevrolet

Project No. 080190-004-11 • May 16, 2014 Final

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Aspect CONSULTING

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List of Acronyms

Aspect	Aspect Consulting, LLC
ACFM	actual cubic feet per minute
ARAR	applicable, relevant, and appropriate requirement
ASTM	American Society for Testing and Materials
bgs	below ground surface
cDCE	cis-1,2-dichloroethylene
COC	chemical of concern
COPC	chemical of potential concern
dBA	decibel, A-weighted
DO	dissolved oxygen
DOT	Department of Transportation
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FFS	Focused Feasibility Study
GAC	granular activated carbon
gpm	gallons per minute
HDPE	high density polyethylene
HP	horsepower
IWC	inches of water column
KW	kilowatt

KWH	kilowatt hour
lbs	pounds
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
MTCA	Model Toxics Control Act
MNA	monitored natural attenuation
ORP	oxidation-reduction potential
PCE	tetrachloroethylene
PID	photoionization detector
Property	Morrell's Dry Cleaners Property
PSCAA	Puget Sound Clean Air Agency
PVC	polyvinyl chloride
RI	Remedial Investigation
SCFM	standard cubic feet per minute
Site	Morrell's Dry Cleaners Site
SVE	soil vapor extraction
TCE	trichloroethylene
TOC	total organic carbon
TPN	tax parcel number
UST	underground storage tank
VCP	Voluntary Cleanup Program
VI	vapor intrusion
VOC	volatile organic compound

1 Introduction

This Interim Cleanup Action Construction and Design Report documents construction and pilot testing of a remediation system and baseline groundwater sampling at the Morrell's Dry Cleaners Site (Site) in Tacoma, Washington. Soil and groundwater at the Site have been impacted by historical releases of dry cleaning solvents associated with a dry cleaning business. The remediation system was constructed to control migration of contaminant vapors to indoor air and to remediate impacted soil beneath an existing building. Pilot test and groundwater sampling results were used to finalize remediation system design and to design a groundwater monitoring and biostimulation program to enhance degradation of contaminants in groundwater, as described in this report.

1.1 Site Description

The Morrell's Dry Cleaners Property (Property) is located at 608 North First Street in Tacoma, Washington. As shown in Figure 1, the Property is located on a triangular city block, consisting of multiple tax parcels, which is bound by North First Street on the northwest, Tacoma Avenue on the northeast, and Division Avenue on the southeast. This block includes two sites registered with the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP). The Morrell's Dry Cleaners Site (VCP No. SW1039), the subject of this report, includes the Property and off-Property soil or groundwater confirmed or suspected of being impacted by contaminant releases at the Property. Under this definition, the Site extends to four private parcels and the City of Tacoma rights-of-way in Tacoma Avenue and North First Street that contain detectable concentrations of chlorinated volatile organic compounds (VOCs) in soil and/or groundwater associated with historical releases from the dry cleaning operations. These parcels include the following:

- Tax Parcel No. (TPN) 2030120031 (7,930 square feet, Thriftway Properties, LLC): Contains a 3,600 square foot building that is leased to Morrell's Dry Cleaners and a non-occupied storage space for Stadium Thriftway. The northernmost 7.5 feet of the building containing Morrell's Dry Cleaners extends onto the adjoining parcel to the north (TPN 2030120012).
- TPN 2030120033 (13,450 square feet, Thriftway Properties, LLC): Paved parking lot used by Stadium Thriftway.
- TPN 2030120012 (8,364 square feet, 4 the Boys Company, LLC): Contains Franco the Tailor, Tully's Coffee, office space, and the northernmost 7.5 feet of the building containing Morrell's Dry Cleaners.
- TPN 2030120013 (11,160 square feet, Stadium LLC): Contains retail space.

Low concentrations of chlorinated VOCs were detected in groundwater in the City of Tacoma right-of-way north and west of these parcels. Tetrachloroethylene (PCE), associated with releases from the dry cleaning operations, was detected in groundwater at concentrations slightly above applicable groundwater cleanup levels, while other VOCs were detected in one or more locations at concentrations below cleanup levels. Based on this marginal exceedance, the street rights-of-way marks the approximate northern and western boundaries of the Site.

The Former Walker Chevrolet site (VCP No. SW1040) is limited to TPN 2030120032, which contains the building occupied by Stadium Thriftway, CARSTAR Auto Body, and Titus-Will Service and Tire. Aspect Consulting, LLC (Aspect) is separately preparing a Focused Feasibility Study (FFS) that will address limited soil contamination on the Former Walker Chevrolet site associated with a former paint booth and a set of former fuel underground storage tanks (USTs) that were decommissioned in 1994.

The remediation area is shown in Figure 2. The Morrell’s Dry Cleaners building extends to the edge of a 7.5-foot easement on the adjoining parcel (TPN 2030120012). The 5-foot-wide alley on the north side of Morrell’s Dry Cleaners is located on the adjoining parcel. The soil vapor extraction (SVE) system includes a SVE trench in the alley and angled SVE wells that extend beneath the building. The wells planned for biostimulation are located on all four parcels, including MW-15 and MW-21 on TPN 2030120012, MW-8 near the boundary of TPN 2030120013, MW-2 and MW-16 to MW-18 on TPN 2030120031, and MW-19 and MW-20 on TPN 2030120033.

1.2 Investigation Background

Morrell Dry Cleaners has operated at 608 North First Street since 1972 and dry cleaners have operated at this location since 1929. Aspect submitted a Remedial Investigation (RI) Report (Aspect, 2011) to Ecology summarizing the history of both the Morrell’s Dry Cleaners Site and the Former Walker Chevrolet site. The RI documents results of soil and groundwater quality investigations, and presents a preliminary site conceptual model describing the nature and extent of contaminants and identifying potential exposure pathways. In response to an opinion letter from Ecology dated September 26, 2011 (Ecology, 2011), Aspect completed additional investigations and prepared a Data Gaps Investigation memorandum (Aspect, 2012). These reports identified chlorinated VOCs in soil, groundwater, and soil vapor at concentrations above applicable cleanup levels.

The Site is underlain by Vashon Till to approximately 30 feet below ground surface (bgs), Vashon Advance Outwash sand from approximately 30 to 60 feet bgs, and Olympia Bed Interglacial Deposits and Undifferentiated Glacial and Interglacial Deposits from approximately 60 feet bgs to the lowermost boring depth of 146 feet bgs.

The uppermost water bearing unit is in the advance outwash sand, with depth to water of about 45 feet bgs. Groundwater in this unit is likely recharged from south of the Site, including from Wright Park, and from on-Site sources such as leaky storm or sanitary sewer lines. Groundwater in the outwash sand migrates generally northward, but with a strong downward hydraulic gradient. Monitoring of wells constructed along Tacoma Avenue indicates the outwash sand is dry on the downgradient (north) side of the Site, with groundwater instead encountered in deeper glacial and interglacial sands at depths below about 110 feet bgs. Groundwater in the deeper units, which is recharged in part from downward migration from the outwash sands at the Site, then likely migrates towards Commencement Bay, which is approximately 1,500 feet northeast of the Site and approximately 250 feet below the Site elevation.

PCE has been released from historical dry cleaning operations and PCE, trichloroethylene (TCE), cis-1,2-dichloroethylene (cDCE), and vinyl chloride have been identified in vadose zone and saturated soil, groundwater, and soil vapor beneath the building. The PCE plume is essentially a vertical plume that extends beneath the building to the outwash sands, with some lateral spreading of the plume in the advance outwash.

1.3 Selected Remediation Approach

Aspect (2013) prepared a FFS to identify and evaluate cleanup alternatives for the Site. The preferred alternative includes the following:

- Engineering controls for soil vapor intrusion (VI);
- SVE beneath the building and adjoining pedestrian alley;
- Biostimulation to enhance degradation of contaminants in groundwater in the upper water bearing zone;
- Monitored natural attenuation (MNA) of residual groundwater contamination; and
- Environmental covenant to maintain engineering controls, to restrict access to contaminated soil, and to restrict groundwater use.

1.4 Summary of Construction, Pilot Testing, and Sampling Activities

Initial construction and pilot testing activities were performed between October 2013 and January 2014. The SVE and biostimulation wells were constructed between October 11 and 22, 2013, and no further wells are planned. The wells were constructed in limited access areas, including beneath the dry cleaning building, and are placed to provide the most practicable coverage to address accessible contamination. Similarly, an SVE trench was constructed in the 5-foot-wide alley on the north side of the dry cleaners between December 3 and 17, 2013, and is planned for source removal and soil VI control in the normally-occupied building space that is potentially impacted by PCE contamination. SVE pilot tests were performed for the SVE trench and SVE wells from January 20 to 22, 2014. All of the monitoring and biostimulation wells on the Morrell's Dry Cleaners Site (VCP No. SW1039) and the Former Walker Chevrolet site (VCP No. SW1040) were sampled between December 12, 2013 and January 23, 2014 and submitted for analysis of chemicals of potential concern (COPCs) and MNA parameters.

1.5 Report Organization

The remaining sections of this interim cleanup action construction and design report include the following:

- **Section 2** describes the construction of the SVE trench, the SVE wells, and the biostimulation wells; and includes soil descriptions and geotechnical and analytical results.

- **Section 3** describes the SVE pilot testing for the SVE trench, the glacial till, and the advance outwash.
- **Section 4** describes the baseline sampling of groundwater on the Morrell's Dry Cleaners Site (VCP No. SW1039) and upgradient Former Walker Chevrolet site (VCP No. SW1040), and describes the nature and extent of contamination and the natural groundwater conditions for the bioattenuation the chlorinated VOC contamination.
- **Section 5** provides the SVE design and describes the SVE collection system, the design specifications for equipment and the process and instrumentation detail, the necessary permits, the planned construction and operations schedule, and the planned monitoring program.
- **Section 6** provides the biostimulation design and describes the biostimulation reagents, wells, and injection procedures; the necessary authorization; the projected effects of biostimulation; and the groundwater monitoring plan.
- **Section 7** describes the planned reporting.

2 Completed Construction Activities

The SVE collection system (i.e., the SVE trench and the four SVE wells) was constructed prior to pilot testing. The SVE trench and SVE wells are anticipated to the be final SVE collection system and are the most practicable means to collect contaminated soil vapor from beneath the suspected sources areas near the building. Seven biostimulation wells were also installed prior to the remediation design. The biostimulation wells penetrate the glacial till and intersect the saturated interval of the advance outwash. The biostimulation wells were placed in suspected and accessible areas of contamination, including beneath the Morrell's Dry Cleaners building and along the Property boundary.

2.1 SVE Trench

The SVE trench was constructed in the 5-foot-wide alley on the north side of Morrell's Dry Cleaners between December 3 and 17, 2013. The layout of the SVE trench is shown in Figure 2 and the details of the SVE trench are shown in Figures 3 and 4.

The construction of the SVE trench included the in-place decommissioning of an 8-foot-long, 750-gallon heating oil UST on the west side of the alley. The heating oil UST was exempt from WAC 173-360 and the Tacoma-Pierce County Health Department regulations; UST decommissioning was permitted with the Tacoma Fire Department and the decommissioning report is provided in Appendix B.

The west end of the trench is adjacent to the decommissioned UST and 11 feet from the west wall of the alley. The SVE trench is 48-feet long and extends to the east side of Morrell's Dry Cleaners. The centerline of the trench is approximately 32 inches north of the Morrell's Dry Cleaners building. The SVE trench was completed with a 4-inch diameter, 0.020-inch slotted, Schedule 80 polyvinyl chloride (PVC) pipe that extends the length of the trench. The top of the slotted pipe is 3 feet bgs. The trench is 1.5-feet wide and is backfilled with pea gravel from 1.5 to 4 feet bgs. The pea gravel backfill is covered by a sealed high density polyethylene (HDPE) cap that is keyed 9 inches into the backfill (to 2.25 feet bgs). A 1-inch layer of hydrated bentonite powder was placed on top of the HDPE cap and vertical pipe penetration. The top 1.5-feet of the trench contain two 4-inch diameter, Schedule 80 PVC conduit pipes that extend to the east side of the trench and that will be connected to the SVE wells in the next phase of construction. The trench above the HDPE cap was backfilled with sand and is covered with 6 inches of reinforced concrete. Three 4-inch diameter, Schedule 80 PVC risers extend from the trench and are flush to the Morrell's Dry Cleaners building. The western-most riser is connected to the SVE trench, while the middle and eastern-most risers are temporarily capped at the eastern edge of the trench above the HDPE cap.

The soils encountered in the trench included hard till material and sandy soil. East of the chimney (shown on Figure 2), the eastern 15 feet of the trench intersects very dense soil beneath 23 inches bgs. The glacial till soil is well-mixed, and contains silt, sand, gravel, and cobble. Soil was sandy west of the chimney and more easily excavated. Soil became harder west of the restroom windows in Morrell's Dry Cleaners, about 18.5 feet east of the west wall. The western 7.5 feet of the trench intersects this dense soil. Thus, the middle 25.5 feet of the SVE trench intersects sandy soil.

As reported in the Data Gaps Investigation (Aspect, 2012), three soil vapor probes were installed in the alley and sampled for VOCs in February 2012. VP-1 was installed in the hard soil on the west side of the trench, VP-2 was installed in the sandy soil in the middle of the trench, and VP-3 was installed in hard soil on the east side of the trench. The concentration of PCE was 150,000 micrograms per cubic meter ($\mu g/m^3$) in VP-2 in the sandy soil, whereas the concentrations of PCE were 270 and 380 $\mu g/m^3$ in VP-1 and VP-3, respectively, in the hard soil. In October 2010, PCE was detected at a concentration of 1.8 milligrams per kilogram (mg/kg) in the 2-foot bgs interval of direct-push probe exploration DP-4 and at concentrations of 1.4 and 0.54 mg/kg in the 3- and 6-foot bgs, respectively, intervals of DP-5, which were located in the middle of the trench alignment. West of VP-2, DP-4 encountered till-like gravelly, sandy, silt and the probe met refusal 2.5 feet bgs. East of VP-2, DP-5 encountered similar till-like structures to 1.5 feet bgs, and then encountered slightly gravelly sand to 4.5 feet bgs and sandy gravel to 6 feet bgs, where the probe met refusal.

During trench construction three soil samples were collected from the bottom of the SVE trench on December 9, 2013. The samples were collected from 4.5 feet bgs, from undisturbed soil beneath the 4-foot bottom of the trench. Sample results are provided in Appendix C and summarized in Table 2-1. Table 2-2 shows the correlations of soil contamination, soil vapor PID measurements, and soil descriptions in the SVE trench.

The February 2012 sub-slab vapor concentrations and the December 2013 PID measurements show that higher vapor phase concentrations were detected in the more permeable soil near the middle of the trench. Although PID and laboratory results (Method TO-15) are correlated, the PID measured soil vapor near the soil surface, whereas the sub-slab vapor samples were collected from extracted soil vapor without dilution. Although PCE accounts for most of the VOC contamination, TCE, toluene, ethylbenzene, and xylenes were also detected in relatively low concentrations by Method TO-15. PIDs are generally non-selective for VOCs and have varying sensitivity for different VOCs. Vapor phase concentrations are more correlated to soil permeability than to soil concentrations, which may indicate that vapor phase contamination diffuses into and accumulates in the more permeable soil.

Although the concentrations of PCE in soil exceeded the 0.05 mg/kg Model Toxics Control Act (MTCA) Method A, Unrestricted Land Use Cleanup Level in the trench, the concentrations of PCE are relatively low. The SVE trench intersects permeable soil that is potentially connected to higher permeable soil and backfill under the Morrell’s Dry Cleaners building and the adjacent retail building. As indicated by the Gore Sorber survey presented in the RI (Aspect, 2011), the highest concentrations of PCE in soil vapor were under Morrell’s Dry Cleaners and near the center of the trench. The higher permeable soil may provide a means of vapor phase contaminant migration. The SVE trench can potentially be used for mass removal through SVE and for sub-slab depressurization for VI control.

2.2 SVE Wells

Four SVE wells were constructed beneath the Morrell's Dry Cleaners building between October 18 and 22, 2013. As shown in Figure 2, the wells were advanced from about 15 feet east of the building and were angle drilled under the building at vertical angles up to 45 degrees. The SVE wells are spaced at an approximate 3.5 foot interval from north to south, and the borings were advanced perpendicular to the building and parallel to each other. SVE wells VE-1 and VE-2 are completed in the glacial till, and VE-3 and VE-4 are completed in the advance outwash. VE-1 and VE-2 are the first and third SVE well from the north, and VE-3 and VE-4 are the second and fourth SVE well from the north. The SVE wells were completed as 4-inch diameter Schedule 40 PVC wells with 0.020-inch slotted screens.

VE-1 and VE-2 were angle drilled at a 45-degree vertical angle, and both wells are 45-feet long. The SVE well screens are 18 to 32 feet bgs and extend 3 to 17 feet laterally beneath the building from its east wall. The well screens for VE-1 and VE-2 are about 7 feet from each other along their entire length.

VE-3 and VE-4 extend deeper and farther under the building than VE-1 and VE-2. VE-3 was drilled at a 45-degree vertical angle and is 64-feet long. The VE-3 well screen is 31 to 45 feet bgs and extends 16 to 30 feet laterally under the building from its east wall. VE-4 was drilled at a 40-degree vertical angle and is 59-feet long. The VE-4 well screen is 30 to 45 feet bgs and extends 10 to 23 feet laterally under the building from its east wall. This means that the well screens are less than 10 feet from each other at their closest approach.

Soil samples were not collected from the angled wells due to the limited ability to recover samples. The stratigraphy was assessed from the boring log for MW-13D prior to drilling. Additionally, soil samples were collected from vertical borings for monitoring wells MW-19 and MW-21 on October 17, 2013 to verify the stratigraphy. MW-13D is located about 90 feet north of the building, MW-19 is located near the southwest corner of the building and MW-21 is located near the northeast corner of the building. MW-13D was sampled continuously; the glacial till was observed to 32 feet bgs and the advance outwash was observed from 32 to 59 feet bgs. Soil samples were collected at 5-foot intervals in the MW-19 and MW-21 borings. In MW-19, very dense till was observed in samples collected to 30 feet bgs, with less dense gravelly sand observed from 35 and 40 feet bgs. In MW-21, dense till was observed in samples collected to 30 feet bgs and dense gravelly sand was observed in samples collected below 35 feet bgs. Soil samples from MW-19 and MW-21 confirm that the bottom of the glacial till is approximately 32 feet bgs.

Soil samples collected from the glacial till and the advance outwash in the MW-21 boring were submitted for analysis of grain size distribution. The glacial till sample collected from 20 to 30 foot bgs had a well-mixed grain size distribution with 36.5% gravel, 45% sand, and 18.5% fines. The advance outwash sample collected from 30 to 45 feet bgs had a well-sorted grain size distribution with 2.9% gravel, 84.2% sand, and 12.9% fines. The geotechnical samples results are provided in Appendix D.

2.3 Biostimulation Wells

This section describes the new and existing monitoring wells that are candidate wells for biostimulation. These include existing wells MW-2, MW-8, and MW-8D, which were installed during prior Site characterization efforts; and new wells MW-15 to MW-21. The well locations are shown in Figure 2 and the boring and well construction logs are provided in Appendix A. The wells are screened in the advance outwash at depths between 41 and 65 feet bgs, with the exception of MW-8D, which is screened in the undifferentiated deposits from 96 to 116 feet bgs.

Wells MW-15 to MW-21 were constructed between October 11 and 17, 2013. MW-15 to MW-18 are angled wells that were advanced from the east-southeast side of Morrell’s Dry Cleaners and extend beneath the building at angles perpendicular to the east-southeast side of the building. Wells MW-19 to MW-21 are vertical wells. MW-15 to MW-21 are 2-inch diameter PVC wells that are completed in the advance outwash between 41 and 60 feet bgs. They are constructed with 0.020-inch slotted screens and 10- to 20-mesh sand filter packs.

Monitoring well MW-15 was constructed as close as feasible to the Property boundary and is intended for the treatment of PCE contamination that migrates from beneath Morrell’s Dry Cleaners in the advance outwash. MW-15 was advanced from 14 feet east of the alley and was constructed at a 37-degree vertical angle. The MW-15 well screen extends laterally 19 to 31 feet beneath the alley and is 44 to 60 feet bgs.

Monitoring wells MW-16 to MW-18 were advanced from south of the SVE wells, at distances ranging from 21 to 28 feet south of MW-15. The monitoring wells are constructed at vertical angles of 23, 32, and 45 degrees, with the intention of constructing well screens that extend along the upgradient side of the Morrell’s Dry Cleaners lease space. The MW-16 well screen extends laterally 2 to 9 feet beneath the building and is 41 to 60 feet bgs. The MW-17 well screen extends laterally 12 to 23 feet beneath the building and is 43 to 60 feet bgs. The MW-18 well screen extends laterally 31 to 45 feet beneath the building and is 46 to 60 feet bgs.

MW-19 and MW-20 are vertical wells that were constructed on the south-southwest side of the Morrell’s Dry Cleaners building. These well were constructed with the intention of treating the upgradient groundwater to prevent the upgradient spreading of the PCE plume and to biostimulate groundwater that naturally migrates beneath the building.

Existing well MW-2 and new well MW-21 are vertical wells constructed on the east-southeast side of Morrell’s Dry Cleaners. MW-2 was constructed 15 feet east of the front door of Morrell’s Dry Cleaners and MW-21 was constructed 17 feet east of the building along the Property boundary. MW-2 is a 2-inch diameter monitoring well that was constructed on January 23, 2007, and has a 0.010-inch slotted screen from 50 to 65 feet bgs and a 10- to 20-mesh sand filter pack. MW-21 is a 2-inch diameter monitoring well that was constructed on October 17, 2013, and has a 0.020-inch slotted screen from 45 to 60 feet bgs.

Existing well MW-8 is located near the Property boundary and 46 feet east-southeast of the northeast corner of the Morrell’s Dry Cleaners building. MW-8 is a 2-inch diameter monitoring well that was constructed on April 17, 2008, and has a 0.010-inch slotted screen from 51 to 61 feet bgs.

Existing well MW-8D is located 25 feet east-southeast of the dry cleaning building and 14 feet south-southwest of the Property boundary. The well is screened in the interglacial deposits and intersects a wet, loose sandy interval from 111 to 115 feet bgs. As described in Section 1.2, the advance outwash interval becomes dry on the north side of the adjacent buildings as the groundwater plume in the advance outwash discharges vertically down through the interglacial deposits. MW-8D is a sentinel well for contaminant migration, and can be used as a compliance well or a biostimulation well if warranted.

2.4 Waste Disposition

The drilling-derived waste was placed in two roll-off containers. The drilling-derived waste was characterized as F001 characteristic waste. The two roll-off containers, which held 10.01 and 14.58 tons of soil, were removed from the Property on November 8, 2013 and transported to the Chemical Waste Management Subtitle C landfill in Arlington, Oregon for soil disposal. The waste disposition reports are provided in Appendix E.

Ecology issued a contained-out determination for the soils in the SVE trench on June 26, 2013 using previous sampling data. The SVE trench soils were placed in a roll-off container. The roll-off container, with 16.21 tons of non-hazardous soil, was removed from the Property on December 16, 2013 and transported to Waste Management's Columbia Ridge Subtitle D landfill in Arlington, Oregon for soil disposal. The contained-out determination letter and the waste disposition reports are provided in Appendix E.

3 Soil Vapor Extraction Pilot Test

SVE pilot testing was performed on January 20 to 22, 2014 to collect performance data needed to finalize the design of the SVE system. Although the SVE trench and wells are intended to comprise the collection system, the pilot test was performed to:

- Determine vacuum and flow relationships of the trench, glacial till, and advance outwash;
- Identify the minimum blower requirements;
- Evaluate impacts of manifolding and common vacuum pressures;
- Evaluate the radius of influence beneath the slab and in the glacial till and advance outwash;
- Evaluate the mass removal rates and their sustainability within the limited duration of the pilot test; and
- Evaluate condensate generation during the limited duration of the pilot test.

3.1 Pilot Test Equipment and Measurements

The SVE pilot test was performed using a small, dolly-mounted blower, a moisture separator and associated fittings, air flow meters, and vacuum and pressure gauges.

3.1.1 Blower

The Rotron EN404 blower is a 1-horsepower (HP), single-phase regenerative blower that was plugged into a 120-volt outlet in Morrell's Dry Cleaners. The blower has a maximum vacuum of 48 inches of water column (IWC) and a maximum flow of 100 standard cubic feet per minute (SCFM) at 0 IWC, and can extract about 67 SCFM at 30 IWC.

3.1.2 Moisture Separator and Intake Piping

A 55-gallon drum with vacuum fittings was placed between the blower and the SVE collection system (i.e., the 4-inch diameter PVC riser from the SVE trench or the 4-inch diameter SVE wells VE-1 and VE-3). Approximately 5 feet of 2-inch diameter metal pipe was placed between the blower intake and the 55-gallon drum, and approximately 2 feet of 2-inch diameter flexible pipe and approximately 6 feet of 2-inch diameter PVC pipe were placed between the 55-gallon drum and the SVE collection system. A gate valve was placed between the blower and the moisture separator to allow adjustment of air pressure and flow from the wellhead for the SVE trench or the tested SVE well.

3.1.3 Vapor Emission Controls

The vapor effluent from the pilot test was discharged through a 10-foot-high metal pipe without treatment. Approximately 1.25 pounds of PCE was discharged to the atmosphere during the pilot test, based on periodic PID and flow measurements on the intake line. The calculated emissions are significantly less than the 500 pound per year regulatory limit.

The Puget Sound Clean Air Agency (PSCAA) is the local air authority with primacy for regulation of air emissions at the Site. As described in Section 6.03(94) of Regulation I of the PSCAA, soil and groundwater remediation systems are exempt from submitting a Notice of Construction and needing an Order of Approval from the PSCAA when air emission releases are less than 15 pounds per year (lbs/year) of benzene or vinyl chloride, less than 500 lbs/year of PCE, and less than 1,000 lbs/year of toxic air contaminants.

3.1.4 Sample Port

The sample port was located between the wellhead and the moisture separator, downstream from a Venturi flow meter and about 4.5 feet downstream of the wellhead. The sample port was used to collect air samples and to measure the wellhead vacuum, the air velocity, and the temperature.

3.1.5 Flow Measurements

Air flow was measured using a Venturi flow meter and an anemometer. An in-line Venturi flow meter, capable of measuring flows greater than 25 actual cubic feet per minute (ACFM), was installed between the sample port and the wellhead. Air speed was measured using an anemometer that was inserted in the sample port in the 2-inch diameter Schedule 80 PVC pipe, which allowed air flow to be calculated by multiplying the air speed by the inside area of the pipe.

The Venturi and anemometer flow measurements were fairly consistent, and the difference between the two measurements generally ranged from less than 1 to 12% of the anemometer flow rate. The anemometer flow measurements were used for the mass calculations because they generally reconcile with the Venturi measurements, flow measurements are available below 25 ACFM, and mass calculations are consistent with the complete dataset.

3.1.6 Vacuum Measurements

In-Line

The vacuum pressure was measured in the sample port between the moisture separator and the Venturi flow meter, which was about 4.5 feet upstream from the SVE system. The in-line vacuum pressure was used to assess the wellhead vacuum pressure in the SVE trench, VE-1, and VE-3 during the respective SVE pilot tests.

Sub-Slab Vapor Points

Temporary sub-slab vapor points were constructed beneath the concrete slab in the dry cleaning building. Vapor probes VP-1 to VP-8 were installed through the 5.5-inch concrete slab by drilling a 5/8-inch hole and installing a ¼-inch polyethylene tube to depths of 9 to 12 inches beneath the finished floor. The tubing was caulked in place to provide a surface seal, and the sub-slab pressure was measured with a micro-manometer that was capable of measuring vacuum pressures as small as to 0.001 IWC.

The locations of VP-1 to VP-8 are shown in Figure 2. Four vapor probes were installed along the centerline of the building with the intention of measuring the radius of influence of the SVE trench, and four vapor probes were installed in the four corners of the building to assess whether the SVE trench was capable of providing vacuum pressure beneath entire building. VP-1 was installed in the alley on the east side of the SVE trench because of poorly marked sub-slab utilities in the boiler room. VP-2, VP-8, and VP-6 were installed in accessible areas in the northwest, southwest, and southeast corners of the building. VP-1 was installed 1.75 feet from the SVE trench on the east side, and VP-3, VP-4, VP-5, and VP-7 were installed along the centerline of the building at respective distances of 9.0, 22.5, 35.0, and 57.4 feet from the SVE trench.

For residential low-rise buildings, American Society for Testing and Materials (ASTM) E2121-13 recommends 0.025 to 0.035 IWC of depressurization (ASTM, 2013). The U.S. Environmental Protection Agency (EPA, 2008) recommends 0.02 IWC of depressurization during the worst case season. The New Jersey Vapor Intrusion and Technical Guidance (2013) applies a 0.004 IWC (equal to 1 Pascal) standard for sub-slab depressurization. Although no standard exists in Washington State, 0.005 IWC is a generally acceptable standard that can be applied for sub-slab depressurization.

Vapor Extraction Wells

The vacuum pressures were measured in the glacial till (VE-1 and VE-2) and advance outwash (VE-3 and VE-4) wells and in the SVE trench during the pilot test.

3.1.7 Concentration Measurements

Air samples were collected from the sample port between the moisture separator and the wellhead. Periodic air samples were collected in Tedlar bags using a peristaltic pump to extract the air from the sample port. A PID was then used to measure the concentrations of VOCs in the Tedlar bags. Air samples were also collected using Summa canisters that were connected directly to the sample port, and submitted to Eurofins Air Toxics, Inc. for the analysis of VOCs by Method TO-15. A total of six air samples were collected, which included an initial and final air sample from the SVE pilot tests for the trench, VE-1, and VE-3. The air analytical results are provided in Appendix F.

3.1.8 Temperature Measurements

The temperature was measured in the sample port between the moisture separator and the wellhead.

3.1.9 Noise Measurements

The ambient noise levels were measured while the blower operated in the alley on January 23, 2014 after the conclusion of the pilot tests. The blower was connected to the SVE trench. Noise levels were measured in the alley, on the sidewalks east and west of the alley, outside the front and back doors of Morrell’s Dry Cleaners, outside the back door to the counselors’ offices on the east side of the alley, and inside Morrell’s Dry Cleaners adjacent to the door to the alley. The ambient outside noise levels ranged from 53 to 75 decibels (dBA, A-weighted) when the blower was turned off. For comparison, a normal conversation is about 60 to 65 dBA. When operating, the blower was not audible outside the front or back doors of Morrell’s Dry Cleaners or inside the dry cleaners. Although the blower was audible outside the counselors’ doors (55 to 59 dBA) on the east side of the alley and on the sidewalk on the west side of the alley (57 to 68 dBA) behind the brick wall on North First Street, the range of the measured noise levels did not exceed the ambient noise level range. When the blower operated, the noise level was 79 dBA in the alley and 60 to 61 dBA at the outside of the gate on the east side of the alley.

3.2 SVE Pilot Test Results

SVE pilot tests were performed for three segments of the SVE system to evaluate system performance for treatment from the sub-slab soils, the glacial till, and the advance outwash, respectively. Table 3-1 summarizes the SVE pilot test measurements and calculations and Table 3-2 summarizes the air emission sampling results.

3.2.1 SVE Trench

A 4.25-hour, constant-rate, SVE pilot test was performed for the SVE trench using a non-restricted blower. Figure 5 shows the pressure, flow, and concentrations measurements during the test. The blower operated with at a vacuum pressure of about 30 IWC, which yielded an air flow rate of about 75 ACFM; this corresponds with the blower performance specifications at standard conditions. The vacuum pressure was below the maximum vacuum of 48 IWC for this 1-HP regenerative blower, and the air flow was constrained by the size of the blower.

Although the vacuum pressure was about 30 IWC at the blower, the vacuum pressure at the wellhead was below the 3 IWC lower limit of the manometer. The low wellhead pressure in the SVE trench is the result of the large area of influence of the trench. As shown in Figure 6, the vacuum pressure in the trench can be observed by the pressure response beneath the building. The blower induced a negative pressure gradient under much of the building within 15 minutes of start-up, and the vacuum pressures remained steady during the 4.25-hour pilot test. The sub-slab pressure in the alley on the east side of the SVE trench was approximately 0.55 IWC in VP-1. VP-1 is subject to pressure losses along about 25 feet of the SVE trench and through about 1.75 feet of hard, glacial till that was encountered on the east side of the trench. The vacuum pressure decreased with distance along the centerline of the building and the blower induced a vacuum pressure of less than 0.005 IWC to the far wall of Morrell's Dry Cleaners, which is about 43 feet from the SVE trench. The three vapor probes in the adjoining Stadium Thriftway storage space did not respond to the SVE pilot test, which indicates that the 1-HP regenerative blower was not capable of maintaining a 0.005 IWC vacuum pressure beneath the storage space within the 4.25-hour duration of the pilot test. There was also no response in VP-2 in the northwest corner of Morrell's Dry Cleaners. Because of the decommissioned heating oil tank in the alley, VP-2 is located about 13 feet from the end of the SVE trench and hard, glacial till was encountered on the west side of the trench. The SVE trench had an approximate 45-foot radius of influence beneath the slab foundation in areas where there were relatively permeable soil and sufficient surface sealing to prevent pressure losses. The pressure response was not observed in glacial till wells VE-1 and VE-2 because of the low pressures in the SVE trench, the minimum 18-foot depth to the top of the angled well screens, and the low permeability of the glacial till.

Figure 7 shows the calculated mass removal rate and total emissions during the pilot test. As shown in Figure 5, the PID measurements were 35 and 50% higher than the corresponding concentrations of PCE determined by Method TO-15. PCE was the only VOC detected by Method TO-15 in the SVE trench pilot test. The mass of PCE was calculated from the PID response for VOCs and the measured vacuum pressure, temperature, and air velocity in the influent pipe. The SVE trench pilot test removed about 0.25 pounds per hour (lbs/hour) of PCE and this removal rate was sustained during the 4.25-hour pilot test.

3.2.2 Glacial Till Well VE-1

The VE-1 pilot test was performed with an unrestricted pressure for 1 hour and then with a restricted pressure for 1hour. Figure 8 shows the vacuum pressures, flow rates, and concentration measurements during the VE-1 pilot test. When the pressure was not restricted, the blower operated at the maximum vacuum pressure of 48 IWC, which yielded a wellhead pressure of 37 IWC and a flow rate of 12.5 to 14.5 ACFM. The vacuum pressure was reduced in the second hour of the pilot test to evaluate the response to the well using the same vacuum pressure that was observed in the SVE trench. This simulates the anticipated vacuum pressure when the SVE wells are manifolded with the SVE trench. When the blower operated at 30 IWC, the wellhead pressure decreased to 15 IWC and the flow rate decreased to 9.5 ACFM. This shows that a 250% increase in wellhead vacuum pressure only increased the well flow by about 40%.

Figure 9 shows the vacuum response in glacial till well VE-2, which is about 7 feet from VE-1, and in advance outwash wells VE-3 and VE-4. Although the vacuum pressure at the VE-1 wellhead was about 37 and 15 IWC during the pilot test, the vacuum response was generally less than 0.2 IWC in VE-2. This indicates that there is significant vacuum loss across the glacial till. The radius of influence would be anticipated to increase, however, with extended SVE operation. The advance outwash wells VE-3 and VE-4 were more impacted by SVE operations in glacial till well VE-1 than was VE-2, and the vacuum pressure continued to increase up to 0.78 IWC during the 2-hour pilot test. This may be attributed to the partial penetration of VE-1 into the advance outwash, which has relatively high permeability. Furthermore, the response in glacial till well VE-2 could be the result of short-circuiting through the advance outwash if both VE-1 and VE-2 partially penetrate the interval. The VE-1 pilot test did not reduce the pressure in the sub-slab vapor points.

Figure 10 shows the calculated mass removal rate and total emissions during the pilot test. Increased bioattenuation was observed in the glacial till where PCE, TCE, and cDCE were detected by Method TO-15. The VOC speciation in the two air samples was about 95% PCE, 2% TCE, and 3% cDCE. In general, the more chlorinated species (i.e., PCE) elicit a higher PID response than the less chlorinated species, and DCE and vinyl chloride have limited detectability by PID. Since the VOC speciation is predominantly PCE, and PCE is the most detectable by PID, the mass removal calculations use the molecular weight of PCE. The PID measurements were four to six times higher than the corresponding Method TO-15 measurements, which was relatively high compared to the SVE trench pilot test and the advance outwash SVE pilot test. As shown in Figure 8, the concentrations of VOCs increased up to 90 ppm before falling off to less than 50 ppm. The fall-off in concentrations and the slightly lower flow rate in the second hour of the pilot test reduced the mass emission rate from about 0.025 lbs/hour to about 0.01 lbs/hour of PCE. SVE operations would be anticipated to remove limited quantities of PCE from the glacial till because of its relatively low permeability. Nevertheless, the manifolded SVE system could continue to draw limited quantities of soil vapor from the glacial till without significant pressure and flow losses from the system.

3.2.3 Advance Outwash Well VE-3

The VE-3 pilot test was started within 30 minutes of completing the VE-1 pilot test. The VE-3 pilot test was also performed with an unrestricted pressure for 2 hours and then with a restricted pressure for 2 hours. Figure 11 shows the vacuum pressures, flow rates, and concentration measurements during the VE-3 pilot test. When the pressure was not restricted, the blower operated with at the maximum vacuum pressure of 48 IWC, which yielded a wellhead vacuum of 38 IWC and a flow rate of 30 ACFM. After decreasing the blower vacuum to 30 IWC, the wellhead vacuum decreased to 15 IWC and the flow rate decreased to 19 ACFM. This shows that a 100% increase in wellhead vacuum pressure increased the well flow by about 60%.

Figure 12 shows the vacuum response in the other advance outwash well VE-4 and in glacial till wells VE-1 and VE-2. The VE-3 and VE-4 well screens are not parallel because they were constructed at different vertical angles; however, the well screens are less than 10 feet apart at their closest approach. Although there is significant pressure loss across the advance outwash, the vacuum pressure in VE-4 continued to increase during the first 2 hours of the pilot test to a maximum vacuum of 6.0 IWC before decreasing to 3.2 IWC during the next 2 hours of the pilot test when the wellhead vacuum decreased. This indicates the radius of influence was greater than 10 feet in the advance outwash and that the radius of influence continues to increase with longer SVE duration. The glacial till wells also responded to the VE-3 pilot test, which may be attributed to the partial penetration of these wells into the advance outwash.

Figure 13 shows the calculated mass removal rate and total emissions during the pilot test. Greater bioattenuation was observed in the deeper advance outwash, where PCE, TCE, cDCE, and vinyl chloride were detected by Method TO-15. The VOC speciation in the two air samples was about 69% PCE, 9% TCE, 22% cDCE, and 0.2% vinyl chloride. As described previously, the mass removal calculations use the molecular weight of PCE because PCE is the predominant species and PCE is the most detectable species by PID. The PID measurements were about twice as high as the corresponding Method TO-15 measurements. As shown in Figure 11, the concentrations of VOCs initially spiked at 94 ppm after 15 minutes before decreasing to about 80 ppm after 60 minutes. When the flow rate was reduced after 120 minutes, the concentrations of VOCs gradually increased to about 100 ppm. The total mass emission rate remained fairly stable at about 0.05 lbs/hour of PCE during the 4-hour pilot test. The VE-3 pilot test indicates that the radius of influence is greater than 10 feet in the advance outwash and continues to grow with increased duration, and that the mass removal rate was sustainable during the pilot test. The manifolded SVE system could continuously draw soil vapor from the advance outwash wells and mitigate additional leaching of VOCs from unsaturated soils to groundwater.

4 Baseline Groundwater Sampling

The new and existing monitoring wells at the Morrell's Dry Cleaners Site (VCP No. SW1039) and the Former Walker Chevrolet site (VCP No. SW1040) were sampled between December 12, 2013 and January 23, 2014.

4.1 Monitoring Wells

The monitoring wells include the existing and new monitoring wells and the anticipated biostimulation wells. The sampled advance outwash monitoring wells include existing vertical wells MW-1, MW-2, MW-5, MW-7, MW-8, and MW-11; new angled wells MW-15 to MW-18; and new vertical wells MW-19 to MW-21. Monitoring wells MW-3, MW-4, and MW-6 did not contain groundwater in February 2008, October 2008, and May 2009 and were subsequently decommissioned. MW-9 and MW-10 did not contain groundwater in May 2009, December 2010, February 2012, and December 2013. The existing interglacial deposit monitoring wells include MW-8D and MW-12D to MW-14D.

4.2 Sampling Parameters

The monitoring wells were sampled for VOCs by Method 8260C and for MNA parameters, including dissolved oxygen (DO) and oxidation-reduction potential (ORP) using a YSI meter; nitrate, nitrite, and sulfate by Method 300.0 or equivalent; total iron by Method 200.8; and total organic carbon (TOC) by Method 9060M or equivalent. The samples from MW-1, MW-5, MW-7, and MW-11 were also submitted for analysis of gasoline- and diesel-range total petroleum hydrocarbons, lead, polycyclic aromatic hydrocarbons, and polychlorinated biphenyls to support evaluation of the Former Walker Chevrolet site; however, no other analyte was detected above the detection limit, with the exception of lead, which did not exceed the MTCA Method A Groundwater Cleanup Level.

4.3 Volatile Organic Compound Sample Results

Groundwater gauging and sampling results from 2007 to present are summarized in Tables 4-1 and 4-2 and the analytical results from the December 2013/January 2014 sampling event are provided in Appendix G. Figures 14 and 15 show the concentrations of VOCs in groundwater from the most recent sampling event on the outside and inside of the planned active remediation area, respectively. Results from the December 2013/January 2014 sampling event are generally consistent with prior results presented in the RI Report (Aspect, 2011) and Data Gaps Investigation Report (Aspect, 2012) and used in developing the FFS (Aspect, 2013), although the new monitoring wells help to refine the area of VOC-impacted groundwater.

Groundwater chemicals of concern (COCs) identified in the FFS include PCE, TCE, cDCE, and vinyl chloride. Each of these COCs has been detected in groundwater at concentrations exceeding applicable cleanup levels. The plume of VOC-impacted groundwater exceeding cleanup levels is limited to the shallower outwash deposits at depth of about 45 feet bgs, with only limited concentrations of VOCs detected in wells completed in the deeper water bearing zones. In the deeper zone the concentrations of PCE have fluctuated slightly above and below applicable cleanup levels in wells MW-12D and MW-13D.

In the outwash deposits, the lateral extent of VOCs in groundwater exceeding cleanup levels is centered near wells MW-2 and MW-8, with concentrations decreasing laterally with distance from these wells. This overall pattern is consistent between the historical data and the most recent sampling round.

The main difference between previous sampling results and the most recent round is at well MW-5. Historically groundwater from well MW-5, located upgradient of the Morrell's Dry Cleaners Property, has contained elevated concentrations of PCE (up to 190 μg/L), TCE (up to 14 μg/L), and cDCE (up to 44 μg/L), while well MW-11 located further upgradient contained only low concentrations of TCE (up to 4.6 μg/L). In the most recent sampling event groundwater from MW-5 did not contain detectable concentrations of PCE or cDCE, and contained only a very low concentration of TCE (0.46 μg/L).

One hypothesis for the occurrence of relatively high concentrations of VOCs at upgradient well MW-5 is a water leak at Tully's Coffee that may have temporarily reversed the groundwater gradient, spreading contamination from Morrell's Dry Cleaners south toward MW-5. The water leak was detected beneath the concrete foundation of Morrell's Dry Cleaners in May 2007 (Stemen Environmental, 2009). Based on water bill records, it was estimated that approximately 600,000 gallons of water was released between May 2006 and September 2007. The observed rapid decrease in VOC concentrations at MW-5 between February 2012 and January 2014 is consistent with flushing of dissolved-phase VOCs from the MW-5 areas once the ambient groundwater gradient to the north-northeast was reestablished.

A second difference between historical and recent groundwater data is the detection of carbon tetrachloride in well MW-19 at a concentration (7 μg/L) slightly above the applicable cleanup level (5 μg/L). Carbon tetrachloride was identified as a COPC in the FFS, but was screened-out given the historical detections at concentrations below applicable cleanup levels. Continued groundwater monitoring during ongoing remediation activities will include analysis of carbon tetrachloride to determine whether it should be retained as a COC. Regardless, carbon tetrachloride is amendable to remediation through the planned groundwater biostimulation (see Section 6), and given the low concentrations, limited extent, and occurrence within the VOC groundwater remediation area, carbon tetrachloride is expected to be remediated concurrently with the chlorinated VOCs.

4.4 Baseline Natural Attenuation Conditions

PCE and carbon tetrachloride have analogous bioattenuation pathways, and both degrade by reductive dechlorination under anaerobic conditions. Whereas PCE (4 chlorines) degrades to TCE (3 chlorines), then to DCE isomers (2 chlorines), and then to vinyl chloride (1 chlorine); carbon tetrachloride (4 chlorines) degrades to chloroform (3 chlorines), then to dichloromethane (2 chlorines), and then to methyl chloride

(1 chlorine). In reductive dechlorination processes, the chlorinated compound is used as an electron acceptor for microbial respiration. Reductive dechlorination reactions increase as the concentrations of competing electron acceptors decrease, including DO, nitrate, ferric iron, and sulfate, and when sufficient carbon substrate is available for the growth of anaerobic bacteria. The more chlorinated compounds (i.e., more reduced species) are preferential electron acceptors to less chlorinated compounds (i.e., more oxidized species). In general, the order of preferential electron acceptors is carbon tetrachloride, PCE, chloroform, TCE, dichloromethane, DCE, methyl chloride, and vinyl chloride. The less chlorinated species may also bioattenuate through aerobic pathways, and degrade to short-lived intermediate compounds that are generally not detectable.

The concentrations of the MNA parameters are summarized in Table 4-3. The groundwater is generally under aerobic conditions, which has limited the reductive dechlorination reactions. Reductive dechlorination reactions are inhibited when the concentration of DO is greater than 3 mg/L, and are optimized when the concentration of DO is less than 0.5 mg/L. The concentrations of DO generally ranged from 2 to 4 mg/L. Similarly, the ORP measurements and the concentrations of nitrate and sulfate indicate that reductive dechlorination reactions are inhibited. Bioattenuation reactions are also inhibited by the limited amount of available carbon. The concentrations of TOC are very low, and only slightly exceeded the detection limit in MW-18 and MW-19.

Although reductive dechlorination reactions are apparent by the formation of daughter products, natural bioattenuation reactions are limited by the amount of carbon and the aerobic groundwater conditions. Biostimulation is planned to increase the amount of carbon, which will increase microbial activity that will consume the available oxygen and create ideal conditions for anaerobic bacteria that use chlorinated ethylenes and chlorinated methanes for microbial respiration.

4.5 Waste Disposition

Water was generated from development of the new monitoring wells in December 2013 and the purging of the new and existing monitoring wells in December 2013 and January 2014. The development and purge waters were placed into eight 55-gallon and one 30-gallon drums. The drums were characterized as F001 waste, and picked up from the property on February 11, 2014 and transported to the U.S. Ecology Idaho, Inc. facility in Grand View, Idaho for disposal. The waste disposition reports are provided in Appendix E.

5 Soil Vapor Extraction System Design

The section provides specifications for the completion of the SVE system, and describes the emission limits, waste management, planned construction and operation schedule, and the monitoring plan.

5.1 SVE Objectives

SVE will be performed to remove the readily accessible PCE contamination from beneath the sub-slab, glacial till, and advance outwash and to inhibit PCE contamination from migrating into the normally occupied buildings on the Site. Source removal is a short-term objective, whereas sub-slab depressurization is a long-term objective. SVE is anticipated to initially be performed continuously to remove the readily accessible contamination and continuous operations would be performed until diminishing returns are observed. The concentrations of PCE in soil vapor would be anticipated to increase beneath the building in the absence of active SVE operation as soil vapor diffuses from lower permeable soil and accumulates in more permeable soil. During this subsequent remediation phase, SVE may be performed intermittently to remove the soil vapor from beneath the buildings. The frequency and duration of SVE operation would be dependent on the diffusion rate of PCE into the more permeable soil. The SVE blower would likely be operated on a timer that allows the blower to operate for short-term intervals several times a week during non-business hours.

5.2 SVE Collection System

The SVE collection system includes the SVE trench, two angled SVE wells in the glacial till, and two angled SVE wells in the advance outwash. Section 2 describes the construction of the SVE trench and SVE wells and Section 3 describes the SVE pilot tests performed for these segments. These SVE segments provide areal coverage of source contamination and provide the most practicable SVE collection system for the Site. No further SVE segments are planned. This section summarizes the SVE collection system segments and describes how they will be connected to the SVE equipment described in Section 5.3.

5.2.1 SVE Trench

As described in Section 2.1, the SVE trench is a 48-foot long, 4-foot deep trench that was constructed in the 5-foot-wide alley between Morrell’s Dry Cleaners and Tully’s Coffee. The SVE trench contains a 4-inch diameter Schedule 80 PVC pipe with a 0.020-inch slotted screen and the top of pipe placed at 3 feet bgs. The 1.5-foot-wide trench is backfilled with pea gravel from 1.5 to 4 feet bgs and is capped with an impervious HDPE liner and hydrated bentonite seal. The HDPE liner is keyed into the pea gravel to a depth of 2.25 feet bgs. Figures 3 and 4 show the trench detail.

The SVE trench intersects more-permeable soil near the middle of the trench, where PCE contamination appears to accumulate. The 1-HP blower used in the pilot test operated with a vacuum of 30 IWC and the flow rate was constrained at 75 ACFM, which was the limit of the blower. The vacuum at the wellhead for the SVE trench did not increase above 3 IWC (lower limit of gauge), however, because of the long section of well screen, the large surface area of pea gravel backfill, and the apparent connectivity beneath the concrete slab of the buildings. Surface leakage is not suspected because of the lack of pervious surfaces, the surface seals applied in the trench, the 45-foot radius of influence observed beneath the concrete slab, and the relatively high and stable concentrations of VOCs removed from the trench during the 4.25-hour pilot test.

5.2.2 Glacial Till Wells

Glacial till SVE wells VE-1 and VE-2 are advanced from the east side of Morrell's Dry Cleaners at 45-degree vertical angles that are perpendicular to the building. As described in Section 2.2, the SVE well screens are completed in the glacial till from 18 to 32 feet bgs, the well screens extend 3 to 17 feet laterally beneath the building, and the well screens are parallel and about 7 feet apart from each other along their entire length. The glacial till wells may partially penetrate the top of the advance outwash, which was encountered between 30 and 34 feet bgs in MW-14D, MW-19, and MW-21 near the corners of the building. The SVE radius of influence is limited in the advance outwash. As described in Section 3.2.2, higher vacuum pressures were observed in advance outwash SVE wells VE-3 and VE-4 than in glacial till SVE well VE-2, which may indicate that VE-1 and VE-2 may partially penetrate the advance outwash. Although the SVE was limited by the maximum vacuum of the blower, a 250% increase in wellhead pressure only increased the well flow by 40%. This indicates that SVE is inherently limited by the low permeability of the glacial till, and higher vacuum rates are not warranted.

5.2.3 Advance Outwash Wells

Advance outwash SVE wells VE-3 and VE-4 are advanced from the east side of Morrell's Dry Cleaners and angle drilled beneath the building at vertical angles of 45 and 40 degrees, as described in Section 2.2. Although the wells are perpendicular to the building and parallel to each other, the wells screens are staggered horizontally in the advance outwash and extend between 10 and 30 feet laterally beneath the building, at depths ranging from 30 to 45 feet bgs in the advance outwash. As described Section 3.2.2, a wellhead vacuum of 15 IWC in VE-3 yielded a flow rate of about 18 ACFM, and a vacuum pressure of 3.2 IWC was observed in VE-4, whose well screen is less than 10 feet from the VE-3 well screen at the closet approach. The advance outwash wells appear to have a large radius of influence and the removal of VOCs increased steadily through the 4 hour pilot test.

5.2.4 Piping Detail

The SVE trench was constructed with one 4-inch diameter Schedule 80 PVC slotted pipe within the pea gravel backfill and two 4-inch diameter Schedule 80 PVC solid conveyance pipes above the HDPE liner. The three 4-inch diameter solid pipe risers extend vertically from the concrete in the alley flush with the Morrell's Dry Cleaners building near the restrooms with the boarded windows. The risers were temporarily capped after the pilot tests. The two conveyance pipes in the trench were capped beneath the concrete near the east side of the alley.

The conveyance pipes will be completed during the next phase of construction. One conveyance pipe will be manifolded to the glacial till wells VE-1 and VE-2 and the other conveyance pipe will be manifolded to the advance outwash wells VE-3 and VE-4. The wells will be manifolded without valves such that VE-1 and VE-2 cannot be operated independently and VE-3 and VE-4 cannot be operated independently.

An approximate 30-foot-long trench will be excavated from the east side of the alley to VE-1 to VE-4 on the east side of the building. The two conveyance pipes will be completed to the manifolded wells with a minimum grade of 2.5% and with no sag points where condensate could collect. Any condensate or extracted groundwater will drain back into the wells. The two conveyance pipes will likely be placed beneath the natural gas line that extends east along the parcel boundary. Excavated soil will be screened with a PID, and granular soil that does not elicit a PID response is suitable for re-use as backfill in the trench. The trench will be backfilled with native material and/or sand fill material and the surface will be completed with reinforced concrete. The SVE well piping will be backfilled with sand and completed with a concrete cover, and a survey nail or marker will be placed above each well for future reference.

The three 4-inch diameter riser pipes will be equipped with sample ports, vacuum gauges, anemometer ports, and control valves and then manifolded and connected to the moisture separator in advance of the SVE blower. Union fittings will be placed on each line to allow the removal and replacement of the air sample port, the vacuum gauge, the anemometer port, and the 4-inch PVC ball valve. An air sample port, vacuum gauge, and Venturi flow meter will also be installed upstream of the manifold. The piping will be constructed so that condensate preferentially drains back into the wells or alternately into the moisture separator, such that moisture does not accumulate in the pipe or subject the fittings to stress due to ice expansion.

5.3 Equipment Specification

The SVE system includes a blower, moisture separator, water transfer pump, and two vapor-phase granular activated carbon (GAC) drums. Equipment will be placed on modular skids that can be placed in the alley west of the access door to Morrell’s Dry Cleaners. The equipment specifications and operating principles are summarized in this section. The blower and the water transfer pump will be connected to a dedicated electrical meter in the alley, and the operation of the blower will be controlled by a programmable logic control (PLC) panel with remote access via wireless telemetry.

5.3.1 Blower

The specified blower is a 2-HP Roton EN505, single-phase regenerative blower. At the anticipated operating vacuum pressures, this blower is rated to draw 80 SCFM at 47 IWC and 110 SCFM at 30 IWC. The maximum vacuum is about 65 IWC and the maximum flow rate is 150 SCFM.

The 2-HP blower draws about 1.6 kilowatts (KW), and will use up to 1,200 kilowatt hours (KWH) per month when operating continuously. At $0.12 per KWH, the utility usage charge for the SVE system will be about $144 per month. As described in Section 5.5.2, the SVE system will likely operate on a periodic basis after the initial treatment phase. If the SVE system operates for 12 hours per week, the utility usage charge would be reduced to about $11 per month.

The blower will be installed on a 34-inch by 46-inch skid, which can be easily positioned in the alley. The SVE system is designed to have lower noise emissions than emitted during the SVE pilot tests, as described in Section 3.1.9. The blower has a noise rating of 78 dBA. The blower will be placed in a sound enclosure with passive vent louvers and a high temperature activated ventilation fan. The blower will be equipped with inlet and discharge silencers that reduce noise levels to less than 75 dBA at a 5-foot distance from the equipment.

5.3.2 Moisture Separator and Transfer Pump

The moisture separator and transfer pump will be installed on a separate 34-inch by 48-inch skid, which will be placed in advance of the blower. Water will be collected in a 55-gallon moisture separator under vacuum pressure. The moisture separator will be equipped with a 0.75-HP single-phase pump that automatically discharges water from the vacuum container into a second container at atmospheric pressure. The transfer pump will discharge water from the high-level switch to the low-level switch, but will not operate when the high-level switch is engaged in the second container. The moisture separator will have a high-shutoff switch that shuts down the blower and sends a text notification that indicates that the SVE system needs service.

Minimal wastewater generation is anticipated. Although the groundwater table is about 45 feet bgs, the blower may extract soil moisture and perched water and may desiccate the soil in the unsaturated zone. No wastewater was generated during the SVE pilot tests, but some condensate was observed when soil vapor was extracted from the advance outwash. The system will be modified as necessary to prevent excessive wastewater generation, and associated SVE downtime and waste management.

5.3.3 Vapor Emissions Control

The VOC emissions will be treated with GAC prior to discharge to the atmosphere. GAC treatment is effective for VOC removal and generally has lower capital and operating costs than other vapor control technologies. GAC is more effective for higher molecular weight VOCs such as PCE than for lower molecular weight VOCs such as vinyl chloride. In the SVE pilot tests, PCE accounted for 100% of the VOCs from the SVE trench, 95% of the VOCs for the glacial till, and 68% of the VOCs from the advance outwash. In contrast, vinyl chloride was not detected in the SVE trench and glacial till pilot tests, and vinyl chloride accounted for 0.2% of the VOCs from the advance outwash. The manifolded SVE system will primarily draw soil vapor from the SVE trench, which yields higher flow rates at low vacuum pressures. In the SVE pilot tests, the air flow rate was about four times higher from the SVE trench than from the advance outwash and the concentrations of VOCs were twice as high from the SVE trench. The relative contribution of the SVE trench is anticipated to be higher when the SVE system is manifolded. Thus, the percentage of vinyl chloride is anticipated to be very low. Although biostimulation will increase the concentrations of lower molecular weight VOCs such as DCE and vinyl chloride, treatment will be focused in the saturated zone and the impact of biostimulation to VOC speciation in the unsaturated zone is anticipated to be limited. GAC-treatment effectiveness also increases with temperature. The amount of activated carbon is primarily driven by flow capacity, space limitations, and redundancy. The effectiveness of treatment will be monitored as described in

Section 6.5.2, and the spent GAC will be replaced as necessary to assure compliance with the discharge criteria described in Section 5.4.1.

Two 55-gallon vapor-phase GAC drums will be connected in series, and vapor-phase sampling ports will be installed after each drum. The drums will each contain about 165 pounds of GAC. The emissions from the GAC drums will be discharged through a stack to a minimum of 10 feet above ground level. A rain cap will be installed at the top of the stack to prevent water from entering the stack. The GAC drums have a flow capacity of 150 SCFM.

5.4 Permits and Waste Management

5.4.1 Air Emissions

The Puget Sound Clean Air Agency (PSCAA) is the local air authority with primacy for regulation of air emissions at the Site. As described in Section of 6.03(94) of Regulation I of the PSCAA, soil and groundwater remediation systems are exempt from submitting a Notice of Construction and needing an Order of Approval from the PSCAA when air emission releases less than 15 pounds per year (lbs/year) of benzene or vinyl chloride, less than 500 lbs/year of PCE, and less than 1,000 lbs/year of toxic air contaminants. The emission limits will not be exceeded after vapor treatment, and sampling and calculations will be performed and documented to verify that emission limits are not exceeded.

5.4.2 Wastewater

Condensate from the SVE pilot test will be placed in a 55-gallon DOT approved drum, or other suitable container. The drum will be staged in the alley pending appropriate disposal. Appropriate disposal will likely involve off-site disposal as F001 listed waste within 90 days of generation.

5.4.3 Spent Carbon

Air sampling will be performed to assess when contamination breaks through the first GAC vessel. When and if breakthrough is observed, the spent GAC will be removed from the vessel and placed in a 55-gallon drum for off-site disposal or off-site regeneration, as appropriate. The GAC will be replaced in the vessel, and the new GAC will be placed as the second GAC vessel in series.

5.5 Proposed SVE Schedule

5.5.1 Construction

The SVE system will be constructed as soon as practicable following client authorization, equipment procurement, property access, and subcontractor scheduling.

5.5.2 Operations

The SVE system will be operated pursuant to the SVE objectives described above. Start-up testing will be performed following the construction of the SVE system. Start-up testing will be performed to assess mass recovery from the three segments of the SVE system and to evaluate valve positions to optimize mass removal. The system will operate continuously, and one or more Site visits will follow the start-up testing in subsequent days to evaluate the sustainability of the mass removal rate and to assess system performance and water accumulation. Continuous SVE operations will be performed until the mass recovery rate approaches zero. Periodic Site visits will be performed to measure the mass emissions and system parameters, to adjust the valve positions as necessary to optimize mass recovery, to service the equipment, and to manage wastewater. Once mass recovery rates sufficiently attenuate, the SVE operations will transition to intermittent operations.

5.6 SVE Monitoring Plan

Aspect will periodically assess the performance of the SVE system and confirm compliance with the emission limits. The frequency of Site visits and monitoring are subject to change after the cessation of continuous SVE operations.

5.6.1 Performance Monitoring

Monitoring will be performed to estimate the mass removal rate, to optimize the performance of SVE from the collection system, and to assess the diminishing effectiveness with continued operations. During periodic monitoring events, the vacuum pressure, flow rate, and the concentrations of VOCs will be measured from the wellheads to the three segments (i.e., SVE trench, glacial till wells, and advance outwash wells) and from the manifolded line. The concentrations of VOCs will be measured with a PID. The PCE mass removal rate will be calculated from the flow rate, PID measurement, vacuum pressure, and ambient temperature; and will assume that all contamination exists as PCE. A spreadsheet log will be maintained to calculate the PCE mass removal rate, to estimate the mass of PCE removed since the previous Site visit, and to calculate the total mass of PCE removed to date. The frequency of Site visits and performance monitoring will be dependent of observations, system performance, and wastewater accumulation. Concurrent with the compliance monitoring, an air sample will be collected from the manifolded influent line in a Summa canister and submitted for analysis of VOCs by Method TO-15.

5.6.2 Compliance Monitoring

Concurrent with performance monitoring, effluent air samples will be collected from the effluent of the first and second GAC vessel and measured for VOCs using a PID. The total mass of VOCs emitted will be calculated using a molecular weight for PCE. Quarterly effluent samples from the second GAC vessel will be collected in a Summa canister and submitted for analysis of VOCs by Method TO-15. The total mass of PCE, TCE, DCE, and vinyl chloride will be estimated to confirm compliance with the emission limits.

6 Biostimulation Design

This section describes the specifications and required authorization for biostimulation, the projected effect of biostimulation on COCs in groundwater, and the monitoring plan.

6.1 Biostimulation Objectives

Biostimulation will be performed to enhance the bioattenuation of chlorinated VOCs in the advance outwash through reductive dechlorination reactions. The biostimulants will provide a controlled release of available carbon for up to 3 years to enhance the growth of natural anaerobic bacteria and to maintain a viable microbial population for the *in situ* treatment of the COCs.

Biostimulants will be pumped into all of the impacted wells in the advance outwash to optimize *in situ* treatment, including vertical wells MW-2 and MW-8, new angled wells MW-15 to MW-18, and new vertical wells MW-19 to MW-21. No monitoring wells are planned to evaluate the distribution of amendments or zones of treatment. Although initial treatment may be localized, treatment will improve the groundwater conditions for bioattenuation through natural groundwater advection and dispersion though the treatment areas.

Biostimulation will be performed to reduce the concentrations of PCE and TCE. Several treatment wells will be sampled semi-annually for VOCs and natural attenuation parameters to evaluate the effect, persistence, and recovery of biostimulation. Additional rounds of biostimulation may be warranted to maintain conditions suitable for treatment of PCE and TCE in the advance outwash.

6.2 Biostimulation Specifications

6.2.1 Reagents

Biostimulants are used to stimulate growth of the intrinsic microbial population and to achieve iron- and sulfate-reducing aquifer conditions, which are more favorable for the anaerobic degradation of the chlorinated VOCs. 3-D Microemulsion® (3DMe®) and HRC Primer® will be used to biostimulate the impacted areas of the advance outwash. 3DMe® and HRC Primer® are engineered biostimulants sold by Regenesis. 3DMe® is a blend of lactate, polylactate esters, and free fatty acids and fatty acid esters, which are mixed in the field and injected as a high-volume emulsion. 3DMe® provides variable release rates of electron donors to biostimulate the groundwater for periods of up to 3 years. 3DMe® is slightly viscous and forms colloidal suspensions at concentrations above 300 mg/L. 3DMe® has hydrophilic and lipophilic properties that allow it to bind organic contaminants and be mobile in groundwater. HRC Primer® is a mixture of lactic acid and glycerol, which is injected to provide a short-term release, typically 2 to 3 weeks, of lactic acid to jump start bioactivity and reduce the iron and sulfate in groundwater. HRC Primer® can be economically added to the 3DMe® emulsion to quickly improve the reducing conditions for the reductive dechlorination of chlorinated VOCs.

6.2.2 Injection Wells

Biostimulants will be injected into all of the impacted wells in the advance outwash in order to optimize the enhanced bioattenuation of the COCs in the advance outwash before the groundwater discharges into the underlying interglacial deposits. The selection of the injection wells and biostimulation objectives are described below:

- Biostimulants will be injected into MW-19 and MW-20 on the south side of the Morrell's Dry Cleaners building to inhibit the upgradient migration of contamination and to optimize the reducing conditions in groundwater that naturally migrates beneath the building. PCE was detected at concentrations of 62 and 140 µg/L in MW-19 to MW-20, respectively, in December 2013 and January 2014.
- Biostimulants will be injected into angled wells MW-16 to MW-18, which are staggered across the east-west centerline of the building, to provide areal coverage of the biostimulants beneath the building. MW-16 to MW-18 are screened across the upgradient boundary of the highest soil sources of contamination that were detected by the Gore Sorber survey in February 2010 (Aspect, 2011). PCE was detected at concentrations ranging from 170 to 490 µg/L in MW-16 to MW-18 in December 2013.
- Biostimulants will be injected into angled well MW-15, which is screened beneath the middle of the alley and beneath the higher soil sources of PCE detected by the Gore Sorber survey (Aspect, 2011). Biostimulation in MW-15 will treat contamination that migrates from the dry cleaning building and extends beneath the adjoining commercial building. PCE was detected at a concentration of 480 µg/L in MW-15 in December 2013.
- Biostimulants will be injected in existing well MW-2, which is located about 15 feet east of the front entrance of Morrell's Dry Cleaners. MW-2 is located east of wells MW-16 to MW-18 and encountered the highest concentrations of COCs on the Site. The concentration of PCE was 1,600 µg/L in December 2013.
- Biostimulants will be injected in new well MW-21 and existing well MW-8, which are located approximately 15 and 45 feet east of the alley, respectively, and adjacent to the commercial buildings on the north side of the Site. PCE was detected at concentrations of 500 and 940 µg/L in MW-21 and MW-8, respectively, in December 2013.

The concentrations of COCs were less than the groundwater cleanup levels in MW-5 and MW-7, which are located on the south and east sides of the parking lot, respectively, and the advance outwash was dry in decommissioned wells MW-3, MW-6, and MW-4 and existing wells MW-9 and MW-10 on the west and north sides of the Site and adjoining buildings.

6.2.3 Injection Procedures

The injection rates for the wells are dependent on permeability of the advance outwash, the screen length, and the well losses. The advance outwash consists of well-sorted, medium-fine-grain sands, which have a relatively high permeability compared to the glacial till. Although no permeability tests have been performed for the advance outwash, the permeability is estimated to be slightly less than typical values for sand based on the approximate 0.01 foot per foot hydraulic gradient reported in the RI (Aspect, 2011) and the pressure response in the SVE pilot test for VE-3. The injection rates are anticipated to vary for the injection wells. MW-2 and MW-8 were constructed with 0.010-inch slotted well screens, and have 15 and 10 feet of well screen, respectively; whereas new injection wells MW-15 to MW-21 were constructed with 0.020-inch slotted well screens, and the vertical and angled wells have 15 and 20 feet of well screen, respectively. Ideally, the injection pressure should remain below 12 pounds per square inch gauge (psig) at the surface to prevent hydraulic fracturing during injection below 45 feet bgs. With this constraint, the injection rates are anticipated to range from less than 5 to more than 20 gallons per minute (gpm), with relatively low injection rates into MW-8 and MW-2 and relatively high injection rates into MW-15 to MW-18.

The nine advance outwash injection wells will each be dosed with 400 pounds of 3DMe® Factory Emulsified (one 50-gallon drum) and 30 pounds of HRC Primer® (one 3.7-gallon bucket). The biostimulants would be mixed and diluted with water to form 550-gallon emulsions. If the injection rate into the wells is less than anticipated, the amount of dilution water will be varied as necessary to allow injection into two wells each day. Ideally, two batches of biostimulant solution will be prepared for every injection well, with each batch containing 200 pounds of 3DMe® Factory Emulsified (one half of 50-gallon drum) and 15 pounds of HRC Primer® (one half of 3.7-gallon bucket). The batches will be prepared in a 275-gallon tote. The tote will be filled with approximately 200 gallons of potable water that has a minimum temperature of 50 degrees Fahrenheit. The 3DMe® Factory Emulsified will be mixed using a rotary mixer and then transferred into the tote and mixed with the dilution water. Additional potable water and HRC Primer® will be poured into the diluted 3DMe® emulsion and mixed prior to injection.

An injection pump will be used to inject the emulsion into the injection wells at flow rates of 5 to 20 gpm. A wellhead assembly will be fastened to the injection well, which includes an injection pressure gauge (0 to 20 psig) adjacent to the wellhead and an upstream valve to control the pressure and flow rate to the well. The injection pressure will be limited to 12 psig at the wellhead to prevent hydraulic fracturing. Higher injection pressures are anticipated for the second batch into each injection well because of groundwater mounding and the presence of the emulsion on the well screen and in the formation surrounding the well.

The residual contents in the tote will be washed with potable water at the end of each day and injected into one of the injection wells.

6.3 Underground Injection Authorization

The injection wells are subject to Chapter 173-281 WAC. The wells are Class V underground injection wells that are intended to receive fluid for the purpose of treating contamination, per WAC 173-218-040(5)(a)(x). Because the Site is independently managed under the VCP (No. SW1039), it is not exempt from permitting requirements under WAC 173-218-060(5)(b). Nevertheless, the injection wells are rule authorized because they meet the non-endangerment standard. The injection wells will be registered with Ecology in accordance with WAC 173-218-070 prior to injection.

6.4 Projected Effects of Biostimulation

Biostimulation will be performed at the Site to enhance the natural attenuation of chlorinated VOCs through reductive dechlorination. The effectiveness of the biostimulation is influenced by multiple factors, including the injection radius, the accessibility of chlorinated VOCs, the distribution of biostimulants, the groundwater chemistry, the generation and attenuation of daughter products, and the resiliency of treatment. Specific factors potentially influencing biostimulation effectiveness are discussed in the following sections.

6.4.1 Injection Radius

The injection radius can be estimated by the groundwater travel distance or the fluid displacement radius. The groundwater travel distance can be calculated from Darcy's Law using the injection pressure calculated from the Cooper Jacob approximation of the Theis solution. The groundwater travel distance (i.e., injection radius) during injection is calculated from the following equation:

$$R = \sqrt{\frac{K\Delta h\Delta t}{\theta}}$$

Where:

R = the groundwater travel distance

K = the hydraulic conductivity

Δh = the hydraulic head

Δt = the injection duration

θ = the effective porosity

Using estimated formation parameters for the injection of 550 gallons at 10 gpm, the groundwater travel distance is calculated to be 2.9 feet for a permeability of 1 foot per day, an injection pressure of 28 psig at the top of the well screen (9.0 psig at the surface), an injection duration of 55 minutes, and a porosity of 30%.

Alternately, the injection radius can be estimated from the fluid displacement radius. The fluid displacement radius is calculated using an injection volume of 550 gallons, a saturated thickness of 15 feet, and a porosity of 30%. The fluid displacement is calculated to be 2.3 feet when 100% of the fluid is displacement or 4.6 feet when 25% of the fluid is displaced.

6.4.2 Groundwater Mixing

The injected biostimulants are mobile in groundwater and form colloidal suspensions at concentrations above 300 mg/L. 3DMe® has hydrophilic and lipophilic properties that allow it to bind organic contaminants and be mobile in groundwater. Additionally, the sorption of residual 3DMe® to soil influences migrating groundwater, which then enhances the reductive dechlorination of chlorinated VOCs that are bound to soil downgradient of the biostimulants. 3DMe® has polylactate esters that release lactate for a year or more and free fatty acids that are released for up to 3 years.

Migrating groundwater may transport biostimulants and treated groundwater on the order of 12 feet per year, based on a hydraulic conductivity of 1 foot per day, a hydraulic gradient of 0.01 feet per foot, and a porosity of 30%. This allows the *in situ* treatment of contamination that is beyond the injection radius.

6.4.3 Groundwater Chemistry

As PCE and TCE in groundwater generally do not bioattenuate under aerobic conditions, biostimulation will be applied in the advance outwash to enhance anaerobic conditions. Biostimulation provides carbon substrate for biological growth, which consumes DO and drives the aquifer to anaerobic reducing conditions that favor anaerobic bacteria. Anaerobic bacteria can use nitrate, ferric iron, and sulfate for microbial respiration, which are competing electron acceptors for reductive dechlorination. Reductive dechlorination occurs when PCE and TCE are used as electron acceptors for microbial respiration. Reductive dechlorination occurs when the groundwater parameters (e.g., pH, temperature, and alkalinity) are favorable, sufficient carbon substrate is available, and the concentrations of competing electron acceptors are low. PCE and TCE degrade once the preferential electron acceptors are reduced in groundwater, including DO, nitrate, ferric iron, and sulfate. Reductive dechlorination reactions are optimized under iron- and sulfate-reducing conditions.

Reductive dechlorination reactions are slower for DCE and vinyl chloride compounds, and cDCE and vinyl chloride can accumulate when they are generated faster than they attenuate. DCE can bioattenuate through reductive dechlorination, which generates vinyl chloride, or may bioattenuate with aerobic bacteria, which generates short-lived intermediates, including epoxides, chlorinated ethanes, and chloro-acetaldehydes that are generally not detectable.

Vinyl chloride can degrade to ethylene by reductive dechlorination but ethylene bioattenuates relatively quickly through aerobic and anaerobic processes, which limits its detectability. Vinyl chloride readily bioattenuates through aerobic processes, and aerobic bioattenuation of vinyl chloride is possible in groundwater with very low concentrations of DO. Aerobic bioattenuation of vinyl chloride may be a primary degradation pathway in anaerobic groundwater (SERDP, 2012).

6.4.4 Treatment Effectiveness

The more oxidized chlorinated VOC species (i.e., the ones with more chlorine) are preferably used as electron acceptors, and thus have higher bioattenuation rates. The reductive dechlorination of PCE generates TCE, which attenuates to DCE isomers, which can attenuate to vinyl chloride, which can finally attenuate to ethylene along the critical reductive dechlorination pathway. The concentrations of the daughter products typically increase because they are generated faster than they bioattenuate. cDCE is the more difficult isomer to biodegrade than the 1,1-DCE and trans-1,2-DCE isomers, which results in higher concentrations of cDCE and longer generation times for vinyl chloride. Biostimulation would be anticipated to significantly reduce the concentrations of PCE and TCE in the treated areas, but become less effective for cDCE and vinyl chloride, which may be recalcitrant to reductive dechlorination except under very low reducing conditions and in the absence of significant competing electron acceptors. Although PCE and TCE generally bioattenuate only by reductive dechlorination, cDCE and vinyl chloride can also bioattenuate under aerobic conditions when they are used as electron donors. Vinyl chloride can degrade aerobically in groundwater at very low concentrations of DO (SERDP, 2012).

Natural reductive dechlorination is observed at the Site and the concentrations of vinyl chloride are relatively very low. This may indicate that the groundwater is sufficiently aerobic for vinyl chloride oxidation. Under this condition, biostimulation may create strong reducing conditions in the treatment area to significantly degrade PCE and TCE. The generated DCE and vinyl chloride may then attenuate aerobically downgradient of the treatment area or after the groundwater completely recovers from biostimulation. Residual chlorinated VOCs will continue to attenuate through sorption and dispersion pathways.

6.4.5 Treatment Resilience

The treatment resiliency, frequently referred to as "rebound," is dependent on the distribution, consumption, and attenuation of the injected biostimulants. The resiliency can be monitored by measurement of bioavailable volatile fatty acids and TOC in groundwater, the microbial population and taxonomy, and the attenuation and recovery of competing electron acceptors. Once the effect of biostimulation has diminished, rebound can occur as chlorinated VOCs migrate into the treated areas from non-treated areas or leach from lower permeability intervals.

6.5 Monitoring Plan

6.5.1 Monitoring Objectives

Sampling will be performed to verify the effectiveness of biostimulation, to evaluate the resilience of treatment and recovery of pre-treatment groundwater conditions, and to assess whether additional biostimulation is warranted to reduce the concentrations of PCE and TCE in the advance outwash.

6.5.2 Monitoring and Compliance Wells

Biostimulants will be injected into all of the impacted wells in the advance outwash to optimize enhanced attenuation. No monitoring wells exist or will be installed to evaluate the areal distribution of treatment. Several of the injection wells will be sampled to evaluate the effectiveness and resilience of treatment. The following injection wells will be monitored:

- MW-2 has the highest concentrations of PCE, TCE, cDCE, and vinyl chloride. MW-2 will be sampled to evaluate the degree of PCE and TCE reduction and cDCE and vinyl chloride accumulation.

- Upgradient wells MW-19 and MW-20 will be monitored to evaluate whether PCE and TCE concentrations are reduced to less than the Method A CULs and to assess the recovery of groundwater, which should recover relatively quickly because of migration of non-treated groundwater through the treatment zone.

- Downgradient perimeter wells MW-15, MW-21, and MW-8 will be monitored to assess reduction of PCE and TCE and whether additional biostimulation is warranted.

Wells MW-8D and MW-12D to MW-14D are screened in the interglacial deposits and are not anticipated to be impacted by biostimulation. These wells will be monitored to confirm COC concentrations in the deeper water bearing zone do not increase to above cleanup levels.

6.5.3 Sampling Parameters

The effectiveness of treatment is most readily assessed by measuring the concentrations of chlorinated VOC parent and daughter products and the concentrations of competing electron acceptors. VOCs will be measured by Method 8260C, which will include the chlorinated VOC COCs. Competing electron acceptors include DO, nitrate, sulfate, and ferric iron. DO, ORP, and pH will be measured in the field with a YSI meter and flow through cell. Nitrate, nitrite, and sulfate will be analyzed by Method 300.0 or equivalent. Total iron (Fe) will be analyzed by Method 200.8, and ferrous iron will be analyzed in the field using the Hach Method IR-18C colorimetric test kit. The interim cleanup action does not include the sampling of available carbon and or any biological sampling.

The sampling parameters for wells MW-8D and MW-12D to MW-14D include the proposed COCs and DO, ORP, and pH.

6.5.4 Sampling Frequency

The advance outwash wells will be sampled semi-annually for the first 2 years and annually for the third year. Wells MW-8D and MW-12D to MW-14D will be sampled annually for the first 3 years. The sampling schedule will be modified after 3 years based on the monitoring outcomes.

7 Planned Reports

Construction completion and system status reports will be submitted to Ecology.

7.1 Construction Completion Report

The construction completion report will summarize the completed construction activities for the SVE system and describe the initiation of operations. The construction completion report will also summarize the biostimulation injection activities. The construction completion report is intended to document the completion and initiation of cleanup action activities, and a request for opinion for Ecology is not anticipated.

7.2 SVE System and MNA Status Reports

System status reports will be prepared semi-annually the first year and annually thereafter. The first status report will describe the initial effectiveness of SVE operations, and will provide estimates of mass removal, diminishing returns, and modified operation, as warranted; and will describe the effects of biostimulation 6 months after injection. The remaining system status reports will describe SVE operations, the attenuation of enhanced biostimulation, and the performance of VI controls and MNA. The system status reports will recommend subsequent active and passive cleanup actions, and an opinion from Ecology will be requested as warranted.

References

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Limitations

Work for this project was performed for the David Shaw, Successor to Walker Chevrolet (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

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TABLES

Table 2-1 - Soil Sample Results

Morrell's Dry Cleaners, Former Walker Chevrolet Property, Tacoma, Washington

Boring ID	Sample Depth (ft)	Date	Volatile Organic Compounds												Metals
			PCE	TCE	cis-1,2-DCE	Vinyl Chloride	Chloroform	Naphthalene	Total Xylenes	sec-Butyl Benzene	tert-Butyl Benzene	p-Isopropyl Toluene	1,2,4-Trimethyl Benzene	1,3,5-Trimethyl Benzene	Lead
MTCA Soil, Method A, Unrestricted Land Use, Table Value			0.05	0.03	-	-	-	5	9	-	-	-	-	-	250
DP-01	1	10/21/10	**2.1**	<0.03	<0.05			<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
	2	10/21/10	**1.0**	<0.03	<0.05			<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
DP-02	1	10/21/10	**0.8**	<0.03	<0.05			<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
DP-04	2	10/20/10	**1.8**	<0.03	<0.05			<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
DP-05	3	10/20/10	**1.4**	<0.03	<0.05			<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
	6	10/20/10	**0.54**	<0.03	<0.05			<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
DP-07	2	10/21/10	**3**	<0.03	<0.05			<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
	2.5	10/21/10	**36**	**0.14**	0.11			<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
DP-08	3	10/20/10	<0.025	<0.03	<0.05			**28**	1.16	1.8	0.43	12	76	26	NA
	4.5	10/20/10	<0.025	<0.03	<0.05			0.22	<0.15	0.14	<0.05	0.10	0.49	0.35	NA
DP-09	3	10/20/10	<0.025	<0.03	<0.05			<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
	6	10/20/10	**0.13**	<0.03	<0.05			<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
DP-10	8.5	02/08/12	**0.24**	<0.03	<0.05			<0.05	<0.15	0.94	0.083	0.21	0.054	<0.05	1.70
DP-11	4	02/08/12	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	1.17
DP-12	5.5	02/08/12	<0.025	<0.03	<0.05			<0.05	<0.15	0.13	<0.05	<0.05	<0.05	<0.05	1.75
DP-13	7	02/08/12	<0.025	<0.03	<0.05			<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	1.66
DP-14	7	02/08/12	<0.025	<0.03	<0.05			<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	2.08
DP-15	4	02/08/12	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	1.33
DP-16	4	02/08/12	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	2.81
DP-17	4	02/08/12	NA	NA	NA			NA	NA	NA	NA	NA	NA	NA	1.96
MW-21	11	10/11/13	**0.63**	<0.03	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
	15.5	10/11/13	**44**	**0.77**	0.051	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
	25	10/11/13	<0.025	<0.03	<0.05	<0.05	0.14	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
	40	10/11/13	<0.025	<0.03	<0.05	<0.05	0.1	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
	55	10/11/13	**0.095**	**0.032**	0.095	<0.05	0.15	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
Trench-BT-W-4.5	4.5	12/09/13	**0.25**	<0.03	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
Trench-BT-C-4.5	4.5	12/09/13	**0.26**	<0.03	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA
Trench-BT-E-4.5	4.5	12/09/13	**0.16**	<0.03	<0.05	<0.05	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.05	NA

Notes:

BOLD Highlighted signifies exceedence of MTCA Soil, Method A, Unrestricted Land Use, Table Value.

All values are in units of milligrams per kilogram (mg/kg).

cis-1,2-DCE = cis-1,2-dichloroethylene

ft = feet

NA = not applicable

PCE = tetrachloroethylene

TCE = trichloroethylene

Table 2-2 - Correlation of Soil Contamination, Soil Vapor Measurements, and Soil Sample Descriptions from Bottom of SVE Trench

Morrell's Dry Cleaners, Former Walker Chevrolet Property, Tacoma, Washington

Sample ID	Feet from West Wall (feet from west side of trench)	Soil Description	VOCs (ppm, PID)	PCE (mg/kg, Method 8260C)
Trench BT-W-4.5	22 (11)	Dense, sandy silt; till	0.4	0.25
Trench BT-C-4.5	34 (23)	Medium, coarse gravelly sand	5.2	0.26
Trench BT-E-4.5	47 (36)	Medium sand	0.5	0.16

Notes:

1.0 part per million (ppm) of PCE = 6,800 $\mu g/m^3$ of PCE at standard temperature and pressure.

mg/kg = milligrams per kilogram

PCE = tetrachloroethylene

PID = photoionization detector

SVE = soil vapor extraction

VOC = volatile organic compound

Table 3-1 - Soil Vapor Extraction Pilot Test Measurements and Calculations

Morrell's Dry Cleaners, Former Walker Chevrolet Property, Tacoma, Washington

SVE Component	Time	Elapsed Time (minutes)	Anemometer Velocity (ft/min)	Anemometer Flow Rate (ACFM)	Venturi Meter Flow Rate (ACFM)	Relative Percent Difference of Flow ((A-V)/A)	Vacuum Pressure at Blower (IWC)	Pressure Drop (IWC)	Vacuum Pressure at Wellhead (IWC)	VOC (ppmV, PID)	PCE (ppm, TO-15)	TCE (ppm, TO-15)	cis-1,2-DCE (ppm, TO-15)	trans-1,2-DCE (ppm, TO-15)	Vinyl chloride (ppm, TO-15)	Temp (F)	PCE Mass Removal Rate (lbs/hr)	Cumulative Mass of PCE Removed (lbs)
Distance from Trench (ft)																		
SVE	1/21/14 10:45 AM	0	0	0.0	0		0	0	0	0						52	0.000	
Trench	1/21/14 11:00 AM	15	3,740	76.7	77	-0.4%	28	27.5	0.5	30						52	0.061	0.015
	1/21/14 11:30 AM	45	3,680	75.5	72	4.6%	29	28.5	0.5	122	90	<0.11	<0.11	<0.11	<0.11	52	0.245	0.138
	1/21/14 12:00 PM	75	3,630	74.4	70	6.0%	30	29.5	0.5	118						52	0.234	0.255
	1/21/14 12:30 PM	105	3,720	76.3	68	10.9%	30	29.5	0.5	126						52	0.256	0.383
	1/21/14 1:00 PM	135	3,670	75.3	68	9.6%	30	29.5	0.5	131						52	0.262	0.514
	1/21/14 1:30 PM	165	3,680	75.5	66	12.5%	30	29.5	0.5	125						52	0.251	0.639
	1/21/14 2:00 PM	195	3,680	75.5	68	9.9%	30	29.5	0.5	122						52	0.245	0.762
	1/21/14 2:30 PM	225	3,760	77.1	68	11.8%	30	29.5	0.5	124						52	0.254	0.889
	1/21/14 3:00 PM	255	3,770	77.3	68	12.0%	30	29.5	0.5	125	83	<0.1	<0.1	<0.1	<0.1	52	0.257	1.018
VE-1	1/22/14 10:15 AM	0	610	12.5			48	11	37	37						49	0.011	
Glacial Till	1/22/14 10:30 AM	15	610	12.5			48	11	37	91	24	0.51	0.73	<0.036	<0.036	49	0.028	0.007
	1/22/14 11:00 AM	45	710	14.6			48	11	37	56						50	0.020	0.017
	1/22/14 11:15 AM	60					30	15	15									0.017
	1/22/14 11:30 AM	75	470	9.6			30	15	15	33						49	0.008	0.019
	1/22/14 12:00 PM	105	460	9.4			30	15	15	45						49	0.011	0.024
	1/22/14 12:15 PM	120	470	9.6			30	15	15	43	7.4	0.18	0.26	<0.01	<0.01	49	0.011	0.027
VE-3	1/22/14 12:45 PM	0	1,170	24.0	30	-25.0%	48	10	38	73						58	0.042	
Advance	1/22/14 1:00 PM	15	1,460	29.9	30	-0.2%	48	10	38	94						58	0.067	0.017
Outwash	1/22/14 1:15 PM	30	1,500	30.8	29	5.7%	48	10	38	92	44	5.4	15	<0.057	0.13	57	0.068	0.034
	1/22/14 1:30 PM	45	1,460	29.9	29	3.1%	48	10	38	87						58	0.062	0.049
	1/22/14 1:45 PM	60	1,440	29.5	29	1.8%	48	10	38	76						58	0.054	0.063
	1/22/14 2:00 PM	75	1,380	28.3	29	-2.5%	48	10	38	80						56	0.054	0.076
	1/22/14 2:15 PM	90	1,240	25.4	28	-10.1%	48	10	38	80						55	0.049	0.088
	1/22/14 2:30 PM	105	1,330	27.3	28	-2.7%	48	10	38	77						55	0.050	0.101
	1/22/14 2:45 PM	120	1,220	25.0	28	-11.9%	48	10	38	86						56	0.052	0.114
	1/22/14 3:00 PM	135	860	17.6			30	15	15	84						55	0.038	0.123
	1/22/14 3:15 PM	150	910	18.7			30	15	15	82						53	0.039	0.133
	1/22/14 3:30 PM	165	950	19.5			30	15	15	91						54	0.045	0.145
	1/22/14 3:45 PM	180	960	19.7			30	15	15	99						53	0.050	0.157
	1/22/14 4:00 PM	195	920	18.9			30	15	15	94						53	0.045	0.168
	1/22/14 4:15 PM	210	870	17.8			30	15	15	101						53	0.046	0.180
	1/22/14 4:30 PM	225	850	17.4			30	15	15	102						51	0.046	0.191
	1/22/14 4:45 PM	240	870	17.8			30	15	15	100	46	6.3	14	<0.050	0.12	53	0.046	0.203

Notes:

Wellhead vacuum in the SVE trench was estimated because manometer could not read less than 3 IWC.

A = anemometer flow meter

ACFM = actual cubic feet per minute

DCE = dichloroethylene

ft = feet

hr = hour

IWC = inches of water column

lbs = pounds

min = minute

PCE = tetrachloroethylene

PID = photo ionization detector

ppmV = parts per million by volume

SCFM = standard cubic feet per minute

SVE = soil vapor extraction

V = venturi flow meter

VOC = volatile organic compound

Table 3-1 - Soil Vapor Extraction Pilot Test Measurements and Calculations

Morrell's Dry Cleaners, Former Walker Chevrolet Property, Tacoma, Washington

SVE Component	Elapsed Time (minutes)	VP-1 (IWC)	VP-3 (IWC)	VP-4 (IWC)	VP-5 (IWC)	VP-7 (IWC)	VP-6 (IWC)	VP-2 (IWC)	VP-8 (IWC)	SVE Trench (IWC)	VE-1 (Glacial Till) (IWC)	VE-2 (Glacial Till) (IWC)	VE-3 (Advance Outwash) (IWC)	VE-4 (Advance Outwash) (IWC)
Distance from Trench (ft)		1.75	9	22.5	35	57.4	57.4	12.5	57.9	0				
SVE	0 minutes	0	0	0	0	0	0	0.002	0		-0.023		-0.279	
Trench	15 minutes	-0.058	-0.024	-0.014	-0.01	-0.001	-0.003	-0.003	-0.003		-0.048		-0.061	
	45 minutes	-0.058	-0.025	-0.015	-0.011	0	0	-0.004	-0.001		-0.003		-0.006	
	75 minutes	-0.056	-0.024	-0.014	-0.01	0	0	-0.002	0.001		-0.019		0.051	
	105 minutes	-0.05	-0.02	-0.011	-0.008	0	-0.002	-0.001	-0.003		-0.065		0.188	
	135 minutes	-0.054	-0.023	-0.014	-0.01	0	0.002	-0.002	0.001		-0.102		0.215	
	165 minutes	-0.056	-0.024	-0.014	-0.01	0	-0.001	-0.004	-0.001		-0.029		0.266	
	195 minutes	-0.055	-0.024	-0.014	-0.01	0	-0.001	-0.003	-0.001		-0.007		0.313	
	225 minutes	-0.053	-0.024	-0.013	-0.01	0	0	-0.004	-0.003		-0.006		0.33	
VE-1										0		-0.019	-0.537	-0.537
Glacial Till		0	0	0	0	0.002	0.003	0	0.003	-0.001		-0.507	-0.697	-0.733
		0	0	0	0	0	0.001	0.002	0	0		-0.095	-0.731	-0.747
		0	0	0	0	0	0	0	0	-0.003		-0.131	-0.737	-0.739
		0	0	0	0	0	0	0	0	0		-0.128	-0.78	-0.779
VE-3	0 minutes													
Advance	15 minutes										-0.042	-0.635		-4
Outwash	30 minutes										-0.158	-0.502		-4
	45 minutes										-0.171	-0.198		-4
	60 minutes										-0.113	-1.192		-5.4
	75 minutes										-0.181	-1.483		-5.5
	90 minutes										-0.506	-1.197		-5.6
	105 minutes										-0.815	-1.054		-5.9
	120 minutes										-0.182	-1.118		-6
	135 minutes										-0.256	-1.897		-4.2
	150 minutes										-0.618	-1.957		-3.8
	165 minutes										-0.668	-0.39		-3.5
	180 minutes										-0.15	-0.6		-3.4
	195 minutes										-0.052	-1.37		-3.4
	210 minutes										-0.057	-0.556		-3.2
	225 minutes										-0.04	-0.703		-3.2
	240 minutes										-0.157	-1.152		-3.2

Notes:
Wellhead vacuum in the SVE trench was estimated because manometer could not read less than 3 IWC.
A = anemometer flow meter
ACFM = actual cubic feet per minute
DCE = dichloroethylene
ft = feet
hr = hour
IWC = inches of water column
lbs = pounds
min = minute
PCE = tetrachloroethylene
PID = photo ionization detector
ppmV = parts per million by volume
SCFM = standard cubic feet per minute
SVE = soil vapor extraction
V = venturi flow meter
VOC = volatile organic compound

Table 3-2 - Soil Vapor Extraction Pilot Test Air Emission Sample Results

Morrell's Dry Cleaners, Former Walker Chevrolet Property, Tacoma, Washington

Pilot Test Segment	**Trench**				**Glacial Till, VE-1**				**Advance Outwash, VE-3**			
Sample ID	PT-H1-012114		PT-H2-012114		PT-GT1-012214		PT-GT2-012214		PT-AO1-012214		PT-AO2-012214	
Time	1/21/14 11:30 AM		1/21/14 3:00 PM		1/22/14 10:30 AM		1/22/14 12:15 PM		1/22/14 1:10 PM		1/22/14 4:45 PM	
Elapsed Time (minutes)	45		255		15		120		25		240	
Sample vacuum, field (in-Hg)	-5		-6		-5		-3.5		-5.5		-3.5	
Sample vacuum, lab (in-Hg)	-1.4		-0.4		-2.4		-0.8		-3.3		0	
	ppmV	µg/m^3	ppmV	µg/m^3	ppmV	µg/m^3	ppmV	µg/m^3	ppmV	µg/m^3	ppmV	µg/m^3
PCE	90	610,000	83	570,000	24	160,000	7.4	50,000	44	300,000	46	310,000
TCE	<0.11	<580	<0.10	<540	0.51	2,800	0.18	1,000	5.4	29,000	6.3	34,000
cis-1,2-DCE	<0.11	<430	<0.10	<400	0.73	2,900	0.26	1,000	15	60,000	14	58,000
trans-1,2-DCE	<0.11	<430	<0.10	<400	<0.036	<140	<0.010	<40	<0.057	<220	<0.050	<200
Vinyl chloride	<0.11	<270	<0.10	<260	<0.036	<93	<0.010	<26	0.13	320	0.12	310

Notes:
in-Hg = inches of mercury
DCE = dichloroethylene
µg/m^3 = micrograms per cubic meter
PCE = tetrachloroethylene
ppmV = parts per million by volume
TCE = trichloroethylene

Table 4-1 - Groundwater Elevation Data

Morrell's Dry Cleaners, Former Walker Chevrolet Property, Tacoma, Washington

Well ID	Date	Vertical Angle	Screened Interval (feet bgs)	Top of Casing Elevation (feet, site datum)	Depth to Water (feet)	Groundwater Elevation (feet, site datum)
Advance Outwash Wells						
MW-1	2/27/2008	0	50 to 65	275.25	52.32	222.93
	10/2/2008				53.09	222.16
	5/11/2009				53.68	221.57
	12/22/2010				53.61	221.64
	2/6/2012				52.93	222.32
	1/10/2014				53.21	222.04
MW-2	2/27/2008	0	50 to 65	273.14	51.50	221.64
	10/2/2008				51.84	221.30
	5/12/2009				52.42	220.72
	12/22/2010				52.44	220.70
	2/6/2012				51.77	221.37
	12/12/2013				52.74	220.40
MW-3	2/27/2008	0	52 to 67	272.77	dry	dry
(Decommissioned)	10/2/2008				dry	dry
	5/11/2009				dry	dry
MW-4	2/27/2008	0	49 to 64	273.01	dry	dry
(Decommissioned)	10/2/2008				dry	dry
	5/11/2009				dry	dry
MW-5	2/27/2008	0	50 to 65	273.13	50.87	222.26
	10/2/2008				51.65	221.48
	5/11/2009				52.28	220.85
	12/22/2010				52.21	220.92
	2/6/2012				51.60	221.53
	1/9/2014				52.68	220.45
MW-6	2/27/2008	0	49 to 64	272.55	dry	dry
	10/2/2008				dry	dry
	5/11/2009				dry	dry
MW-7	2/27/2008	0	50 to 65	274.44	52.90	221.54
	10/2/2008				53.08	221.36
	5/11/2009				53.69	220.75
	12/22/2010				53.73	220.71
	2/6/2012				52.98	221.46
	1/7/2014				54.10	220.34
MW-8	10/2/2008	0	51 to 61	273.14	52.68	220.46
	5/12/2009				53.28	219.86
	12/22/2010				53.32	219.82
	2/6/2012				52.58	220.56
	12/7/2013				53.64	219.50
MW-9	5/11/2009	0	60 to 70	273.78	dry	dry
	12/22/2010				dry	dry
	2/6/2012				dry	dry
	12/16/2013				dry	dry
MW-10	5/11/2009	0	60 to 70	274.45	dry	dry
	12/22/2010				dry	dry
	2/6/2012				dry	dry
	12/16/2013				dry	dry
MW-11	5/12/2009	0	53 to 63	273.52	52.20	221.32
	12/22/2010				52.24	221.28
	1/23/2014				52.69	220.83
MW-15	12/17/2013	37	44 to 60	273.84	53	221
MW-16	12/13/2013	23	41 to 60	272.88	53	220
MW-17	12/13/2013	32	43 to 60	272.97	53	220
MW-18	12/12/2013	45	46 to 60	272.80	60	212
MW-19	1/8/2014	0	45 to 60	273.15	52.72	220.43
MW-20	1/8/2014	0	45 to 60	273.03	52.64	220.39
MW-21	12/17/2013	0	45 to 60	274.03	53.66	220.37
Interglacial Deposit Wells						
MW-8D	5/11/2009	0	96 to 116	273.11	112.56	160.55
	12/22/2010				112.58	160.53
	2/6/2012				112.52	160.59
	1/10/2014				112.56	160.55
MW-12D	12/22/2010	0	113 to 123	272.72	129.96	142.76
	2/6/2012				129.80	142.92
	1/10/2014				129.94	142.78
MW-13D	12/22/2010	0	125 to 145	271.96	137.88	134.08
	2/6/2012				137.43	134.53
	12/16/2013				137.70	134.26
MW-14D	2/6/2012	0	123 to 143	272.46	134.02	138.44
	1/10/2014				134.26	138.20

Note:
bgs = below ground surface

Table 4-2 - Groundwater Volatile Organic Compound Sample Results

Morrell's Dry Cleaners, Former Walker Chevrolet Property, Tacoma, Washington

Well ID	Screen Interval (feet bgs)	Date	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	Vinyl Chloride	Carbon Tetrachloride	Chloroform	Chloro-ethane	Naph-thalene
Method A, Groundwater CUL, Table Value (ug/L)			**5**	**5**	**-**	**-**	**-**	**0.2**	**-**	**-**	**-**	**160**
Federal and State Maximum Contaminant Level (ug/L)			**5**	**5**	**70**	**100**	**7**	**2**	**5**	**80**	**-**	**-**
Groundwater CUL (ug/L)			**5**	**5**	**70**	**100**	**7**	**0.2**	**5**	**80**	**-**	**160**
Advance Outwash Wells												
MW-1	50 - 65	8/28/07	1.3	<1	<1	<1	<1	<0.2	<1	<1	<1	<1
		1/30/08	<1	<1	<1	<1	<1	<0.2	<1	<1	<1	<1
		10/2/08	<1	<1	<1	<1	<1	<0.2	<1	<1	<1	<1
		5/11/09	<1	<1	<1	<1	<1	<0.2	<1	<1	<1	<1
		12/22/10	<1	<1	<1	<1	<1	<0.2	<1	<1	<1	<1
		2/6/12	<1	<1	<1	<1	<1	<0.2	<1	<1	<1	<1
		1/10/14	<0.2	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	0.39	<0.2	<0.5
MW-2	50 - 65	8/28/07	**2,900**	**1,800**	**7,100**	7.4	<1	**19**	1.0	1	8.1	<1
		1/30/08	**1,400**	**520**	**2,000**	3	<1	<0.2	<1	2.5	<1	<1
		10/2/08	**1,900**	**880**	**2,300**	5.3	<1	**3.1**	1.0	3.5	1.0	<1
		5/12/09	**1,600**	**930**	**2,400**	5.7	ND	**2.7**	<1	4.0	<1	<1
		12/22/10	**2,100**	**1,100**	**2,100**	4.8	<1	**2.7**	<1	5.0	<1	<1
		2/6/12	**1,600**	**810**	**1,400**	<100	<100	**<20**	<100	<100	<100	<100
		12/12/13	**1,600**	**840**	**1,100**	2.7	<1	**0.84**	<1	3.3	<1	<1
MW-5	50 - 65	1/22/08	**67**	3	13	<1	<1	<0.2	3.3	2.1	<1	<1
		1/30/08	**31**	1.1	4.5	<1	<1	<0.2	2.0	1.8	<1	<1
		10/2/08	**75**	3.2	17	<1	<1	<0.2	1.2	1.9	<1	<1
		5/11/09	**17**	1.1	44	<1	<1	<0.2	<1	<1	<1	<1
		12/22/10	**190**	**14**	41	<1	<1	<0.2	3.2	2.9	<1	<1
		2/6/12	**140**	**8.7**	25	<1	<1	<0.2	<1	<1	<1	<1
		1/9/14	<0.2	0.46	<0.2	<0.2	<0.2	<0.2	<0.2	0.35	<0.2	0.14
MW-7	50 - 65	1/22/08	**6.6**	<1	<1	<1	<1	<0.2	<1	<1	<1	<1
		1/30/08	1.5	<1	<1	<1	<1	<0.2	1.5	<1	<1	<1
		10/2/08	<1	<1	<1	<1	<1	<0.2	1.5	<1	<1	<1
		5/11/09	1.1	<1	<1	<1	<1	<0.2	2.0	<1	<1	<1
		12/22/10	1.4	<1	<1	<1	<1	<0.2	3.3	<1	<1	<1
		2/6/12	<1	<1	<1	<1	<1	<0.2	2.2	<1	<1	<1
		1/7/14	1.4	<1	<1	<1	<1	<0.2	1.6	<1	<1	<1
MW-8	51 - 61	4/22/08	**1,300**	**780**	**2,400**	6.3	<1	**0.2**	<1	2.5	<1	<1
		10/2/08	**680**	**390**	**3,600**	7.6	**10**	**6.9**	<1	2.5	<1	<1
		5/12/09	**780**	**370**	**2,600**	3.7	ND	**2.0**	<1	2.5	<1	ND
		12/22/10	**470**	**150**	**1,800**	3.3	3.7	**1.4**	<1	2.2	<1	<1
		2/6/12	**960**	**610**	**1,600**	<100	<100	**<20**	<100	<100	<100	<100
		12/17/13	**940**	**560**	**1,300**	<50	<50	**<10**	<50	<50	<50	<50

Table 4-2 - Groundwater Volatile Organic Compound Sample Results

Morrell's Dry Cleaners, Former Walker Chevrolet Property, Tacoma, Washington

Well ID	Screen Interval (feet bgs)	Date	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	Vinyl Chloride	Carbon Tetrachloride	Chloroform	Chloro-ethane	Naph-thalene
Method A, Groundwater CUL, Table Value (ug/L)			**5**	**5**	**-**	**-**	**-**	**0.2**	**-**	**-**	**-**	**160**
Federal and State Maximum Contaminant Level (ug/L)			**5**	**5**	**70**	**100**	**7**	**2**	**5**	**80**	**-**	**-**
Groundwater CUL (ug/L)			**5**	**5**	**70**	**100**	**7**	**0.2**	**5**	**80**	**-**	**160**
MW-11	53 - 63	5/12/09	<1	2.3	<1	<1	<1	<0.2	1.4	1.9	<1	<1
		12/22/10	<1	4.6	<1	<1	<1	<0.2	2.8	2.0	<1	<1
		1/23/14	<1	1.4	<1	<1	<1	<0.2	<1	<1	<1	0.15
MW-15 (angled with 37 degree vertical angle)	44 - 60	12/17/13	**460**	**110**	**380**	<10	<10	**<2**	<10	<10	<10	<10
		12/17/13	**480**	**110**	**370**	<10	<10	**<2**	<10	<10	<10	<10
MW-16 (angled with 23 degree vertical angle)	41 - 60	12/13/13	**490**	**98**	**350**	<1	<1	**0.49**	2.2	2.5	<1	<1
MW-17 (angled with 32 degree vertical angle)	43 - 60	12/13/13	**170**	**24**	**81**	<1	<1	<0.2	3	2.4	<1	<1
MW-18 (angled with 45 degree vertical angle)	46 - 60	12/12/13	**490**	**57**	**350**	<1	<1	**0.53**	<1	1.3	<1	<1
MW-19	45 - 60	1/8/14	**62**	4.8	20	<1	<1	<0.2	**7**	3.8	<1	<1
MW-20	45 - 60	1/8/14	**140**	**16**	43	<1	<1	<0.2	3.6	2.2	<1	<1
MW-21	45 - 60	12/17/13	**500**	**130**	**460**	<10	<10	**<2**	<10	<10	<10	<10
Interglacial Deposit Wells												
MW-8D	96 - 116	5/11/09	<1	<1	11	<1	<1	<0.2	1.9	<1	<1	<1
		12/22/10	<1	<1	21	<1	<1	<0.2	2.0	<1	<1	<1
		2/6/12	<1	<1	26	<1	<1	<0.2	1.8	<1	<1	<1
		1/10/14	<0.2	<0.2	42	<0.2	<0.2	<0.2	1.7	0.68	<0.2	0.8
MW-12D	113 - 133	12/22/10	**6.1**	<1	22	<1	<1	<0.2	<1	<1	<1	<1
		2/6/12	<1	<1	17	<1	<1	<0.2	<1	<1	<1	<1
		1/10/14	0.7	0.34	22	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
MW-13D	125 - 145	12/22/10	**14**	3.2	30	<1	<1	<0.2	<1	<1	<1	<1
		2/6/12	4.2	2.4	28	<1	<1	<0.2	<1	<1	<1	<1
		12/16/13	**5.9**	3.7	32	<1	<1	<0.2	<1	<1	<1	<1
MW-14D	123 - 143	2/6/12	4.2	3.3	28	<1	<1	<0.2	<1	<1	<1	<1
		1/10/14	2.4	1.0	4.5	<1	<1	<0.2	<1	<1	<1	2.0

Notes:

BOLD Highlighted signifies exceedance of Proposed Groundwater CUL (most stringent of MTCA Method A, Table Value and Federal and State MCL).

All values are in units of milligrams per liter (ug/L).

1,1-DCE = 1,1-dichloroethylene

bgs = below ground surface

cis-1,2-DCE = cis-1,2-dichloroethylene

MCL = maximum contaminant level

MTCA = Model Toxics Control Act

ND = not determined

PCE = tetrachloroethylene

TCE = trichloroethylene

trans-1,2-DCE = trans-1,2-dichloroethylene

Table 4-3 - Groundwater Monitored Natural Attenuation Parameter Sample Results

Morrell's Dry Cleaners, Former Walker Chevrolet Property, Tacoma, Washington

Well ID	Screen Interval (feet bgs)	Date	DO (mg/L)	ORP (mV)	Nitrate (mg/L)	Nitrite (mg/L)	Sulfate (mg/L)	Iron, total (mg/L)	Ferrous Iron (mg/L)	TOC (mg/L)
Natural Attenuation Parameters, Ideal[1]			**<0.5**	**<-200**	**<1**		**<20**		**>0**	**>20**
Natural Attenuation Parameters, Adverse[1]			**>3**	**>200**	**>5**		**>20**			**<10**
Advance Outwash Wells										
MW-1	50 - 65	1/10/14	0.4	114	0.2	<0.1	8.8	4.07		<1.5
MW-2	50 - 65	12/12/13	4.4	141	0.959	NA	9.26	6.17		<0.25
MW-5	50 - 65	1/9/14	2.1	74	0.7	<0.1	20.6	11.5		<1.5
MW-7	50 - 65	1/7/14	8.5	53	1.39	0.006	28.4	14.3		<0.25
MW-8	51 - 61	12/17/13	0.4	23	0.33	0.004	20.9	77.3		<0.25
MW-11	53 - 63	1/23/14	2.3	73						
MW-15 (angled with 37 degree vertical angle)	44 - 60	12/17/13	4.1	75	2.08	<0.002	15.4	0.968		<0.25
MW-16 (angled with 23 degree vertical angle)	41 - 60	12/13/13	2.4	50	1.76	0.004	17	4.13		<0.25
MW-17 (angled with 32 degree vertical angle)	43 - 60	12/13/13	1.7	63	1.51	0.004	14.9	32.8		<0.25
MW-18 (angled with 45 degree vertical angle)	46 - 60	12/12/13	3.8	122	0.681	NA	17.8	0.216		0.639
MW-19	45 - 60	1/8/14	2.4	97	2.66	0.006	22.7	113		0.254
MW-20	45 - 60	1/8/14	5.9	114	2.02	0.007	16.9	40.8		<0.25
MW-21	45 - 60	12/17/13	2.6	56	2.12	0.005	13.9	79.1		<0.25
Interglacial Deposit Wells										
MW-8D	96 - 116	1/10/14	7.6	112	1.6	<0.1	22.8	0.79		<1.5
MW-12D	113 - 133	1/10/14	8.3	114						
MW-13D	125 - 145	12/16/13	5.4	85						
MW-14D	123 - 143	1/10/14								

Notes:

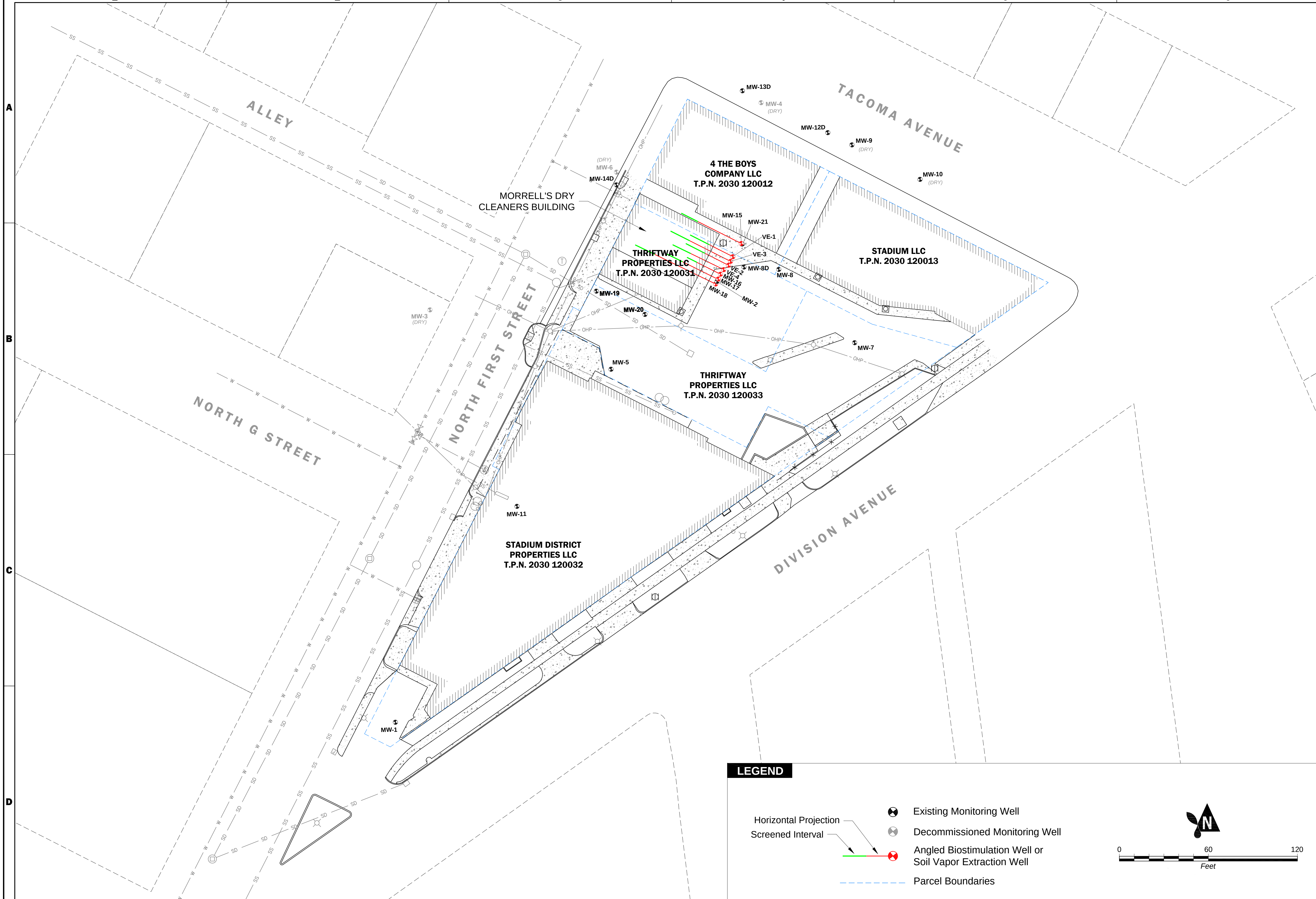
All values are in units of mg/L unless stated otherwise.

Blank cells indicate sample was not analyzed for that parameter.

1 = Derived from geochemical profile scoring tables, "Draft Technical Protol: A Treatability Test for Evaluating the Potential Applicability of the Reductive Anaerobic Biological In Situ Treatment Technology (RABITT) to Remediate Chloroethenes," Department of Defense, Environmental Security Technology Certification Program, February 23, 1998, p. 19.

bgs = below ground surface
DO = dissolved oxygen
mg/L = milligrams per liter
mV = millivolts
NA = not applicable
ORP = oxidation-reduction potential
TOC = total organic carbon

FIGURES



SITE MAP

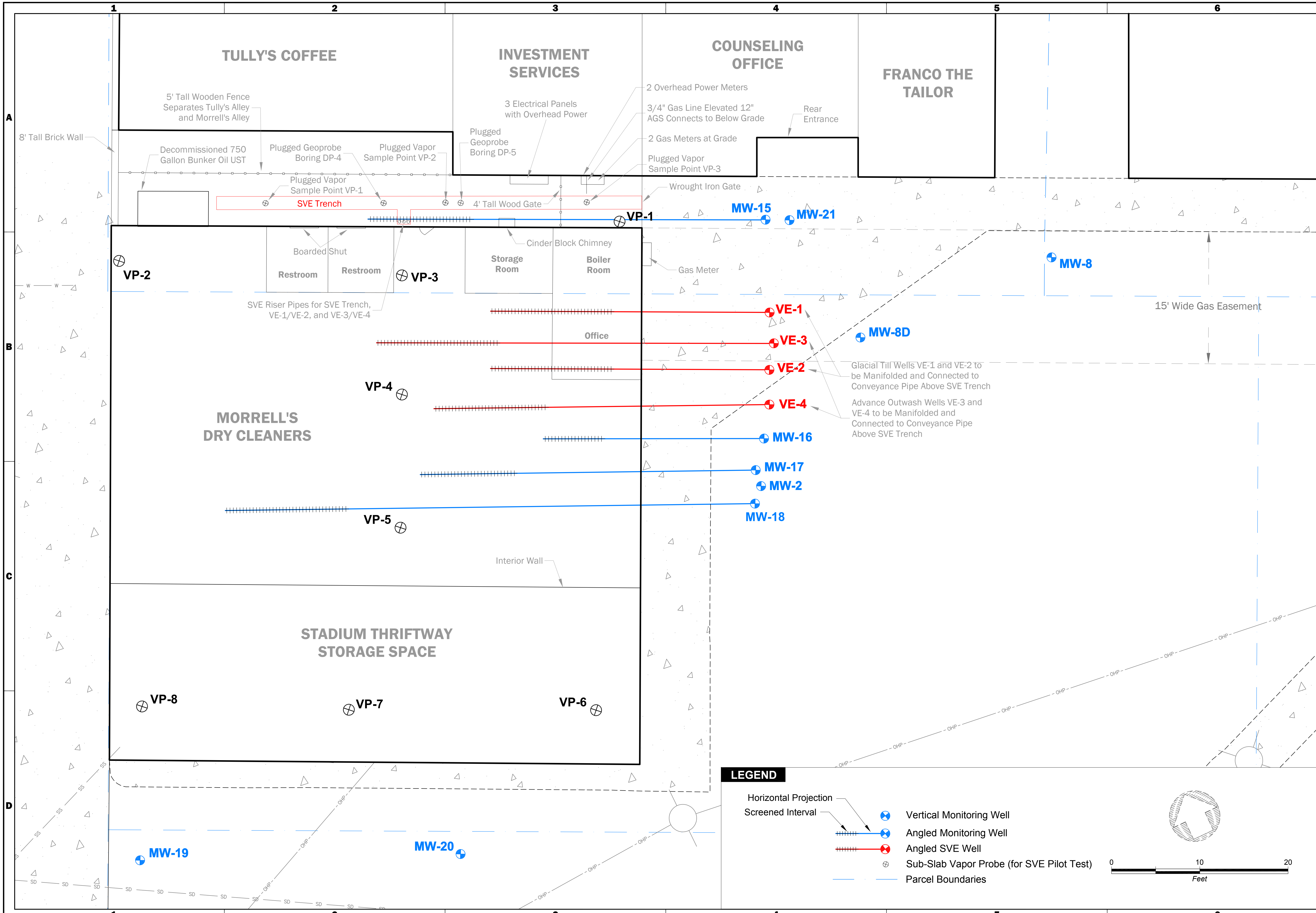
MORRELL'S DRY CLEANERS
CONSTRUCTION AND DESIGN REPORT
TACOMA, WASHINGTON

Aspect CONSULTING

DATE: APR 2014
REVISION:
PROJECT NUMBER: 080190
DESIGNED BY: AN
DRAWN BY: SCC
REVISED BY:

FIGURE NO.

1



Aspect CONSULTING

DATE: APR 2014
PROJECT NUMBER: 080190
DESIGNED BY: AN
DRAWN BY: SCC

REMEDIATION AREA

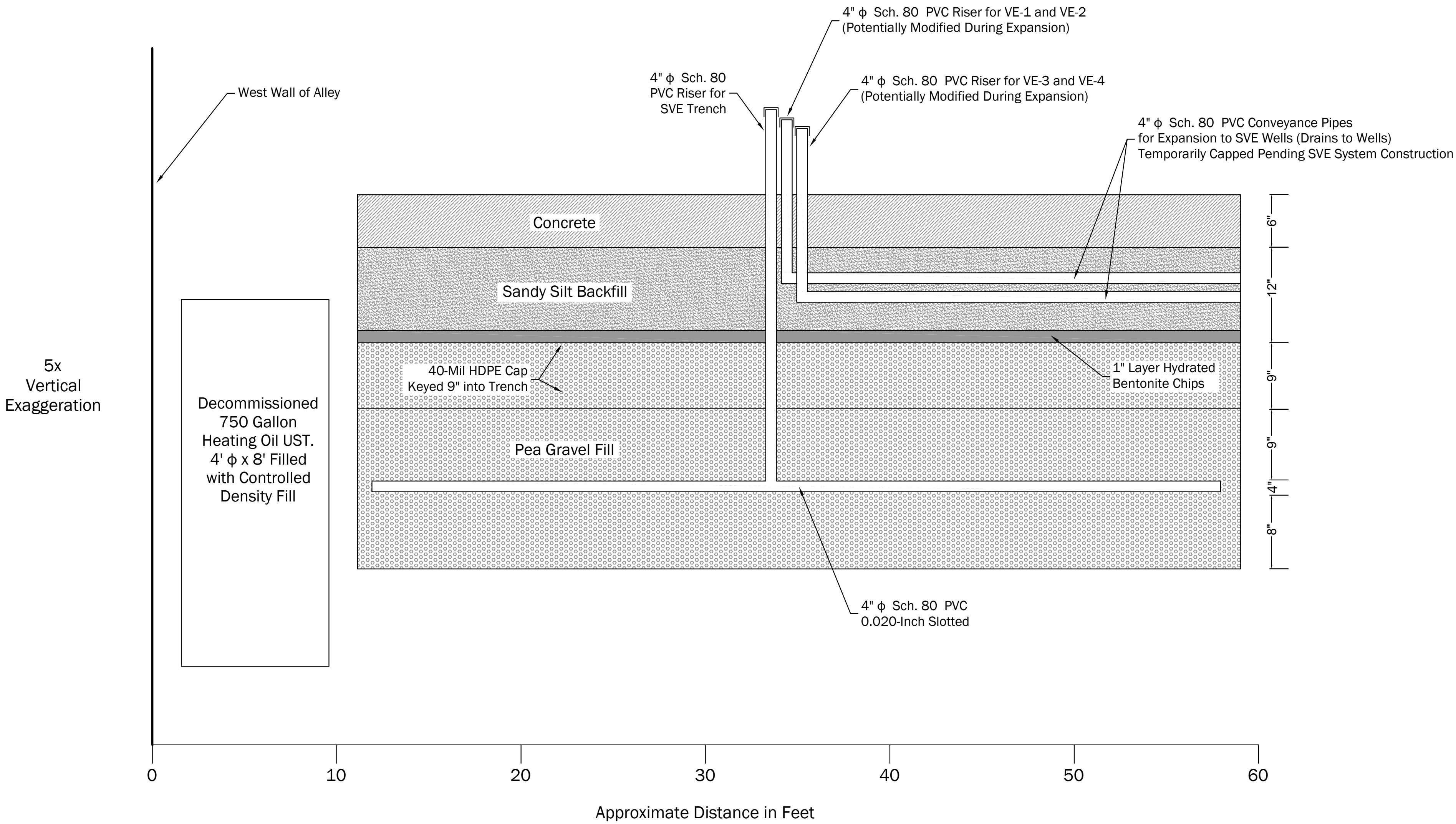
MORRELL'S DRY CLEANERS

CONSTRUCTION AND DESIGN REPORT

TACOMA, WASHINGTON

FIGURE NO.

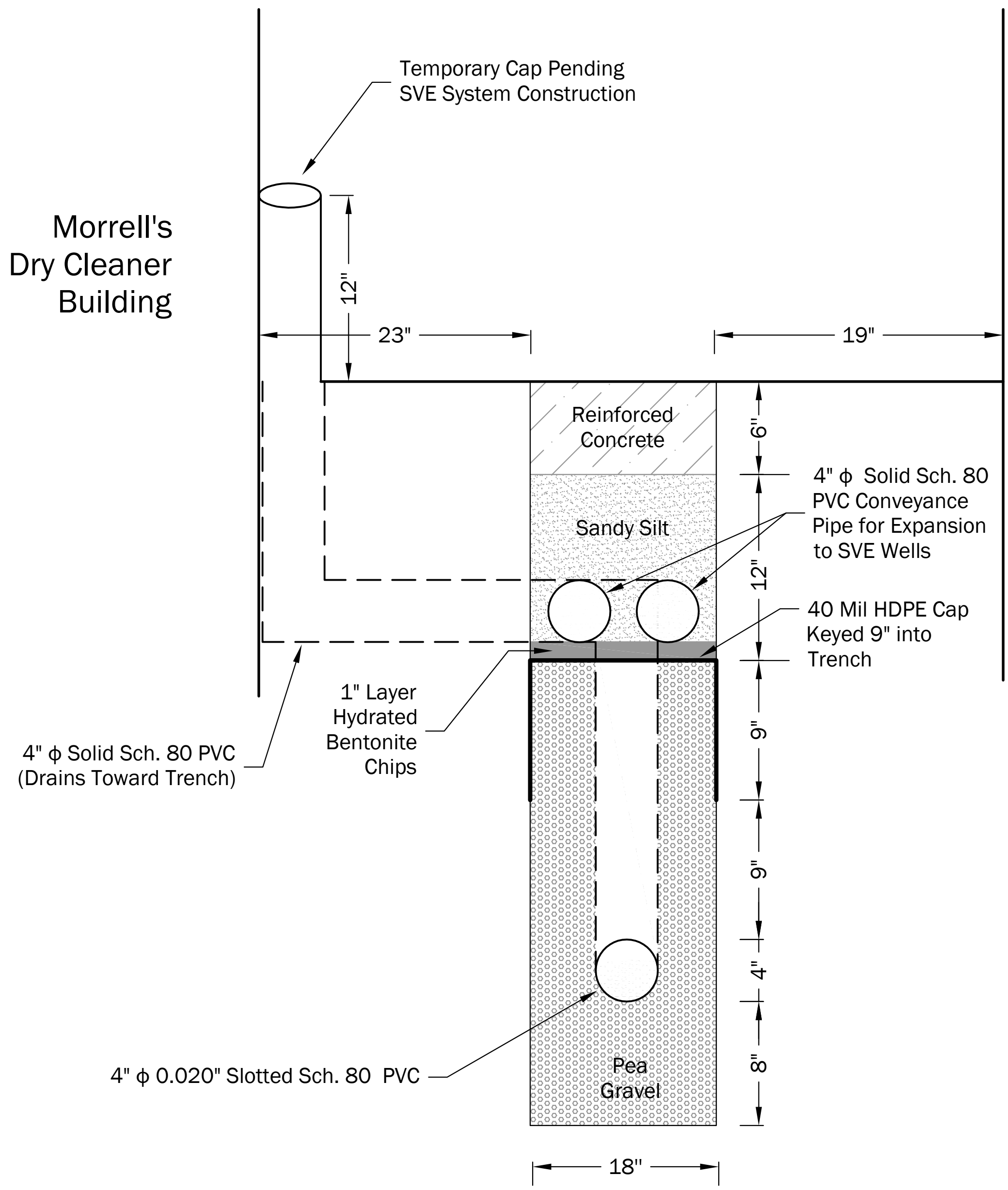
2



SVE Trench Detail in Alley North of Morrell's Dry Cleaners-View to North

Morell's Dry Cleaners Construction and Design Report
Tacoma, Washington

Aspect CONSULTING	APR-2014	BY: AN/SCC	FIGURE NO.
	PROJECT NO. 080190	REV BY: SCC	3



SVE Trench Detail in Alley North of Morrell's Dry Cleaners-View to West

Morell's Dry Cleaners Construction and Design Report

Tacoma, Washington

Aspect CONSULTING	APR-2014	BY: AN/SCC	FIGURE NO.
	PROJECT NO. 080190	REV BY: SCC	4

CAD Path: Q:_GeoTech\080190 Stadium Thriftway\2013-12 Engineering Design Report\080190-06.dwg West View || Coordinate System: NAD 1983 State Plane Washington North FIPS 4601 Feet || Date Saved: Apr 01, 2014 12:07pm || User: scudd

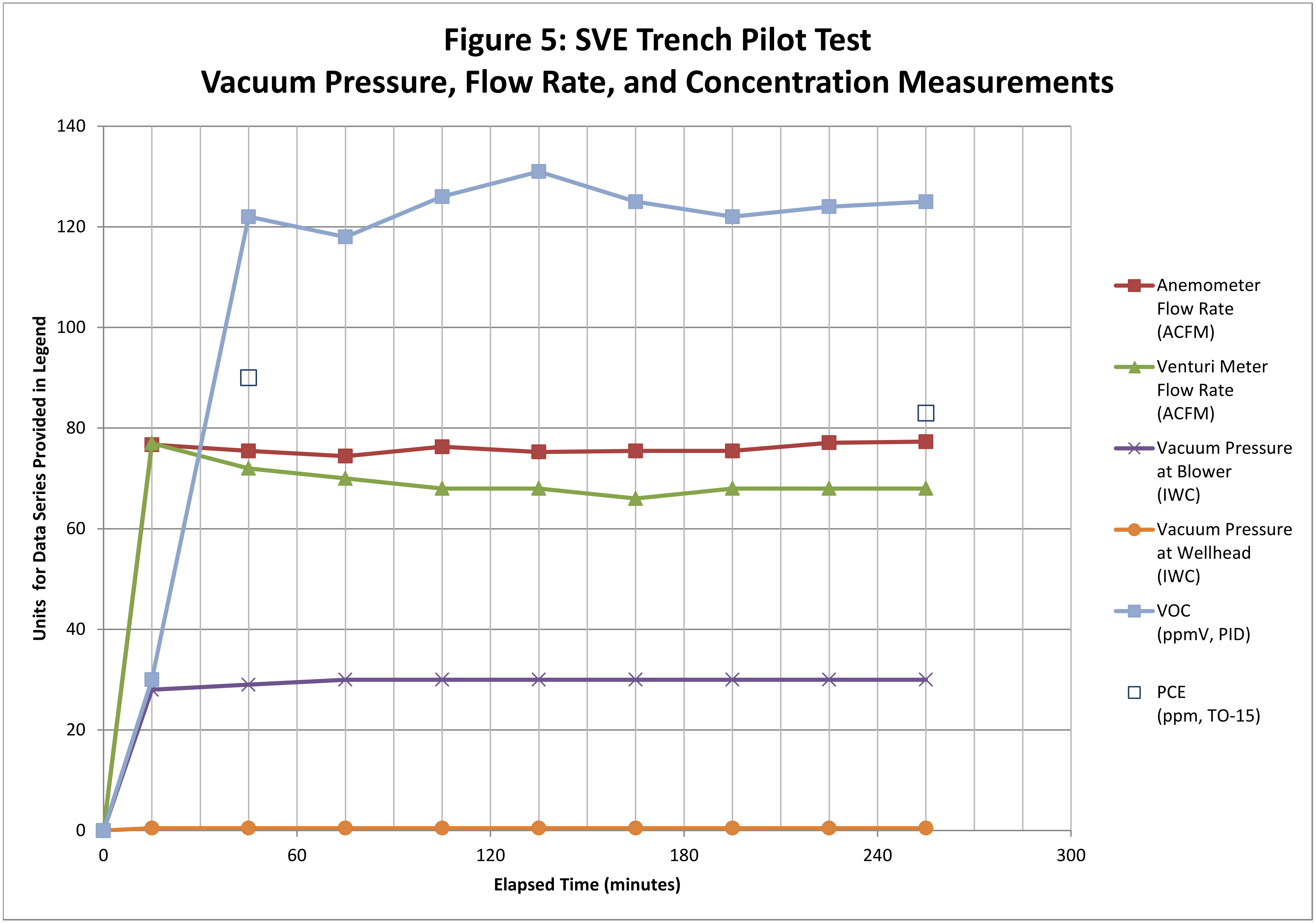
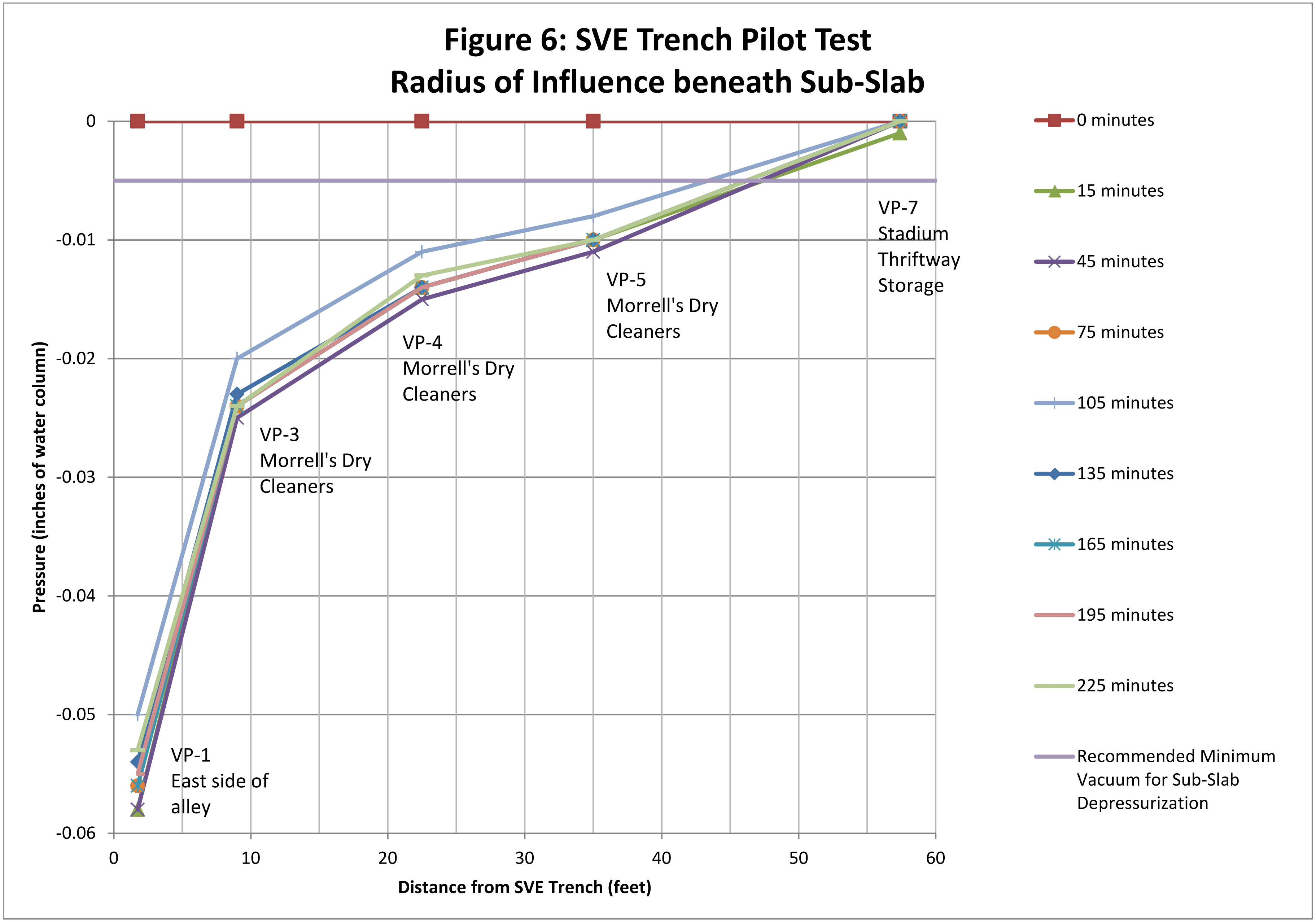


Figure 5
SVE Trench Pilot Test
Vacuum Pressure, Flow Rate, and Concentration Measurements



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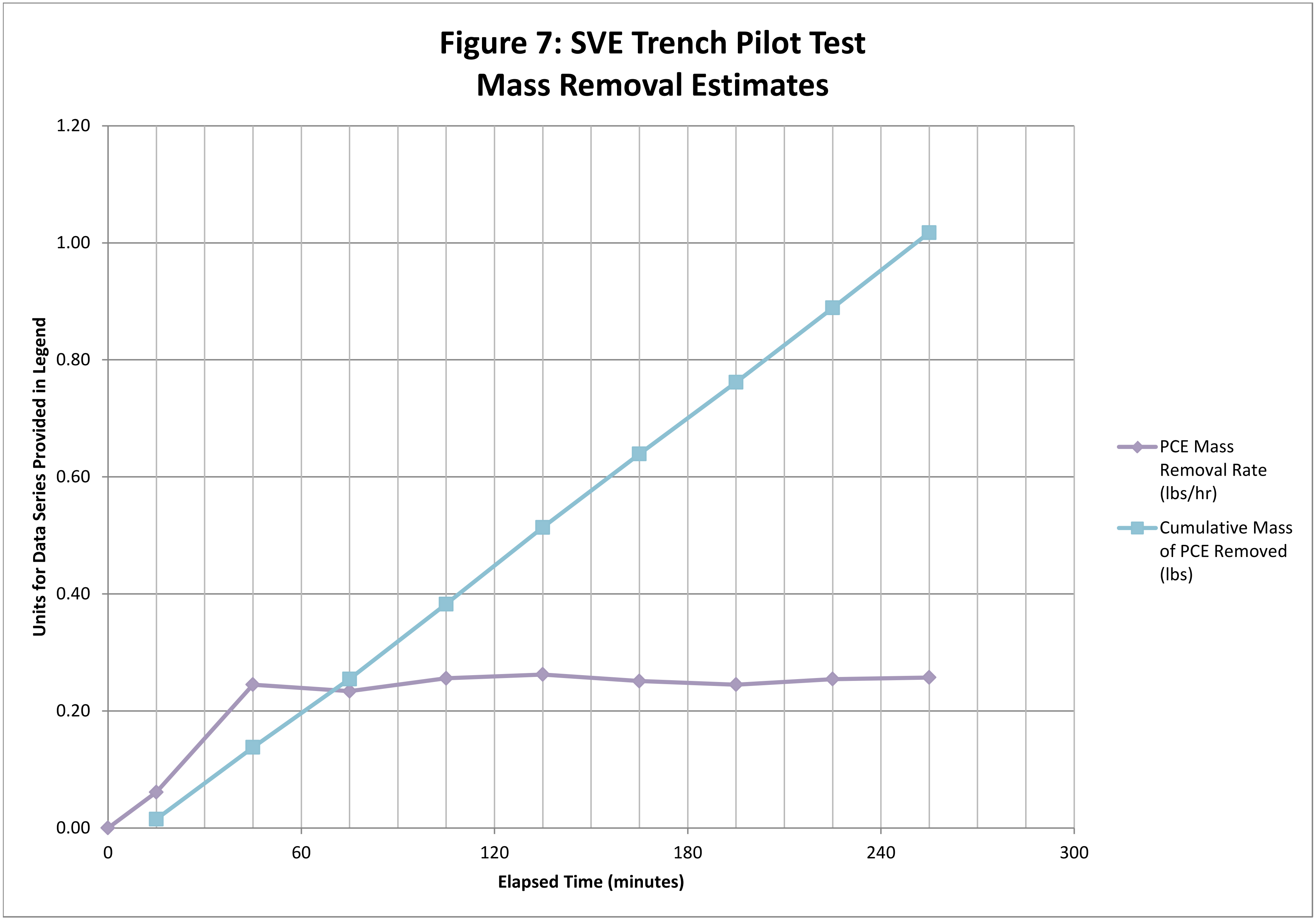
V:\080190 Stadium Thriftway LLC\Deliverables\Construction and Design Report
Morrell's SVE Pilot Test Calcs - Revised 5.15.2014.xlsx - SVE Trench PT ROI

Figure 6
SVE Trench Pilot Test
Radius of Influence beneath Sub-Slab



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5/16/2014
V:\080190 Stadium Thriftway LLC\Deliverables\Construction and Design Report
Morrell's SVE Pilot Test Calcs - Revised 5.15.2014.xlsx - SVE Trench PT Mass Calcs

Figure 7
SVE Trench Pilot Test
Mass Removal Estimates

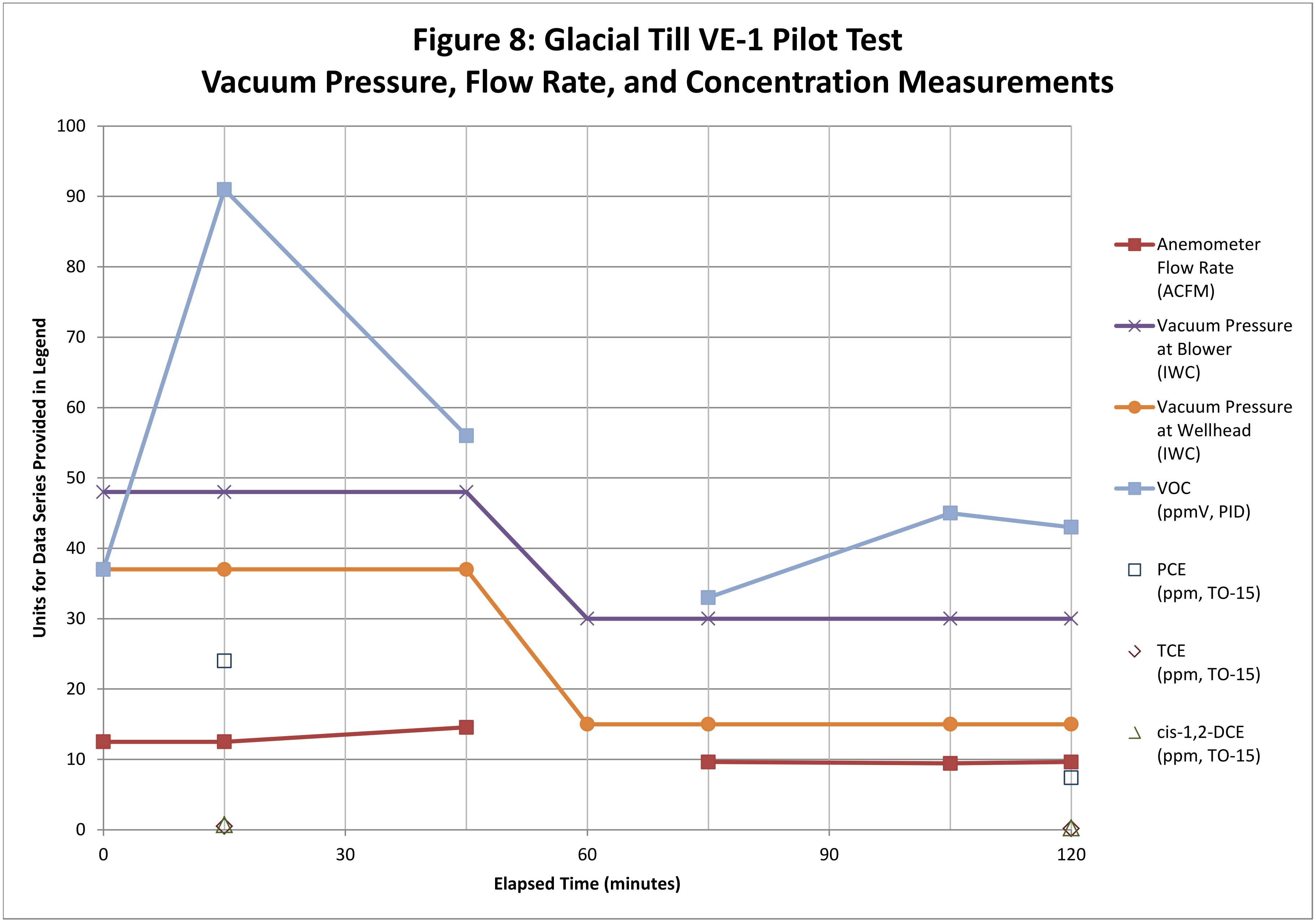
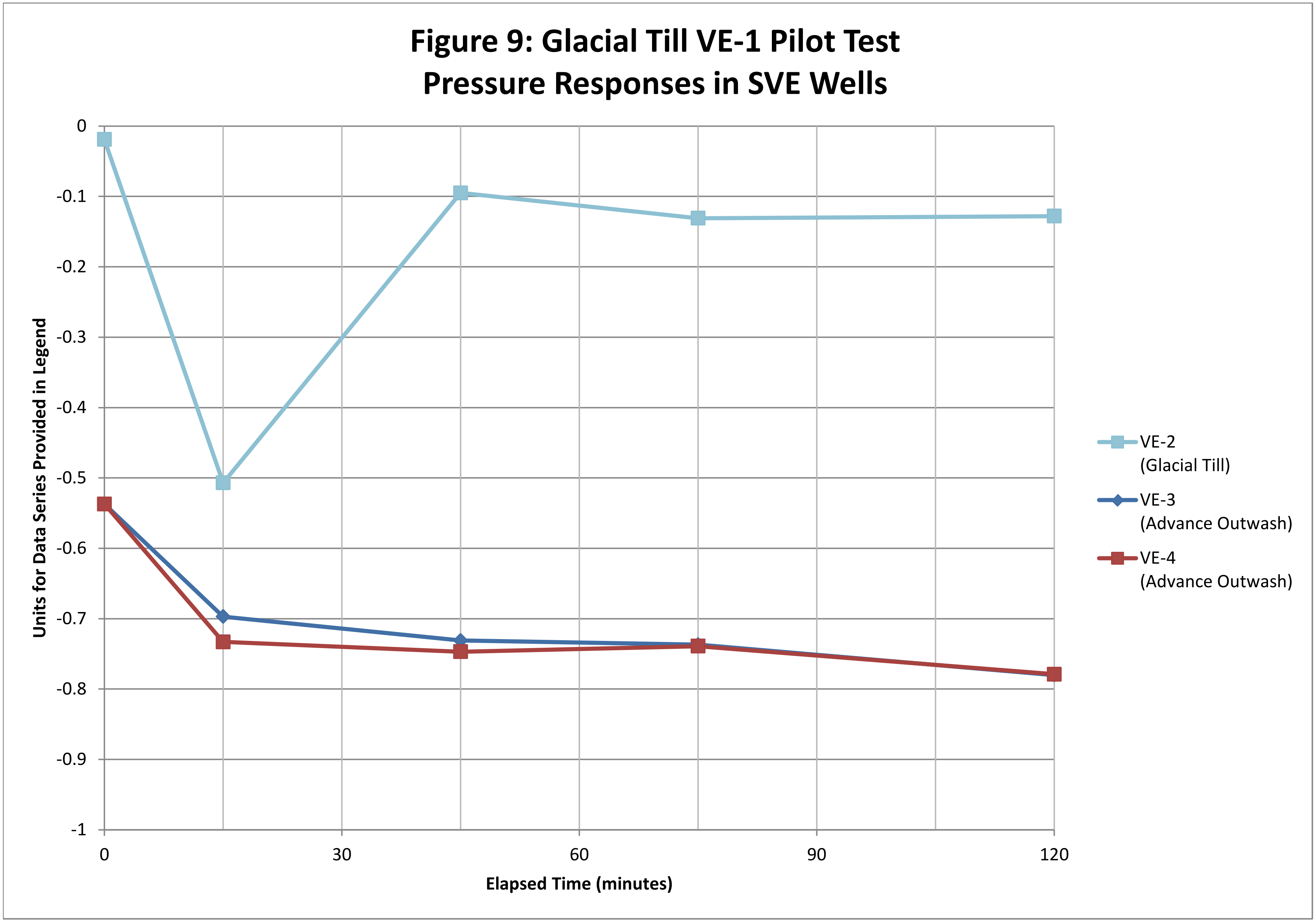


Figure 8: Glacial Till VE-1 Pilot Test
Vacuum Pressure, Flow Rate, and Concentration Measurements
Units for Data Series Provided in Legend
100
90
80
70
60
50
40
30
20
10
0
0
30
60
90
120
Elapsed Time (minutes)
Anemometer Flow Rate (ACFM)
Vacuum Pressure at Blower (IWC)
Vacuum Pressure at Wellhead (IWC)
VOC (ppmV, PID)
PCE (ppm, TO-15)
TCE (ppm, TO-15)
cis-1,2-DCE (ppm, TO-15)



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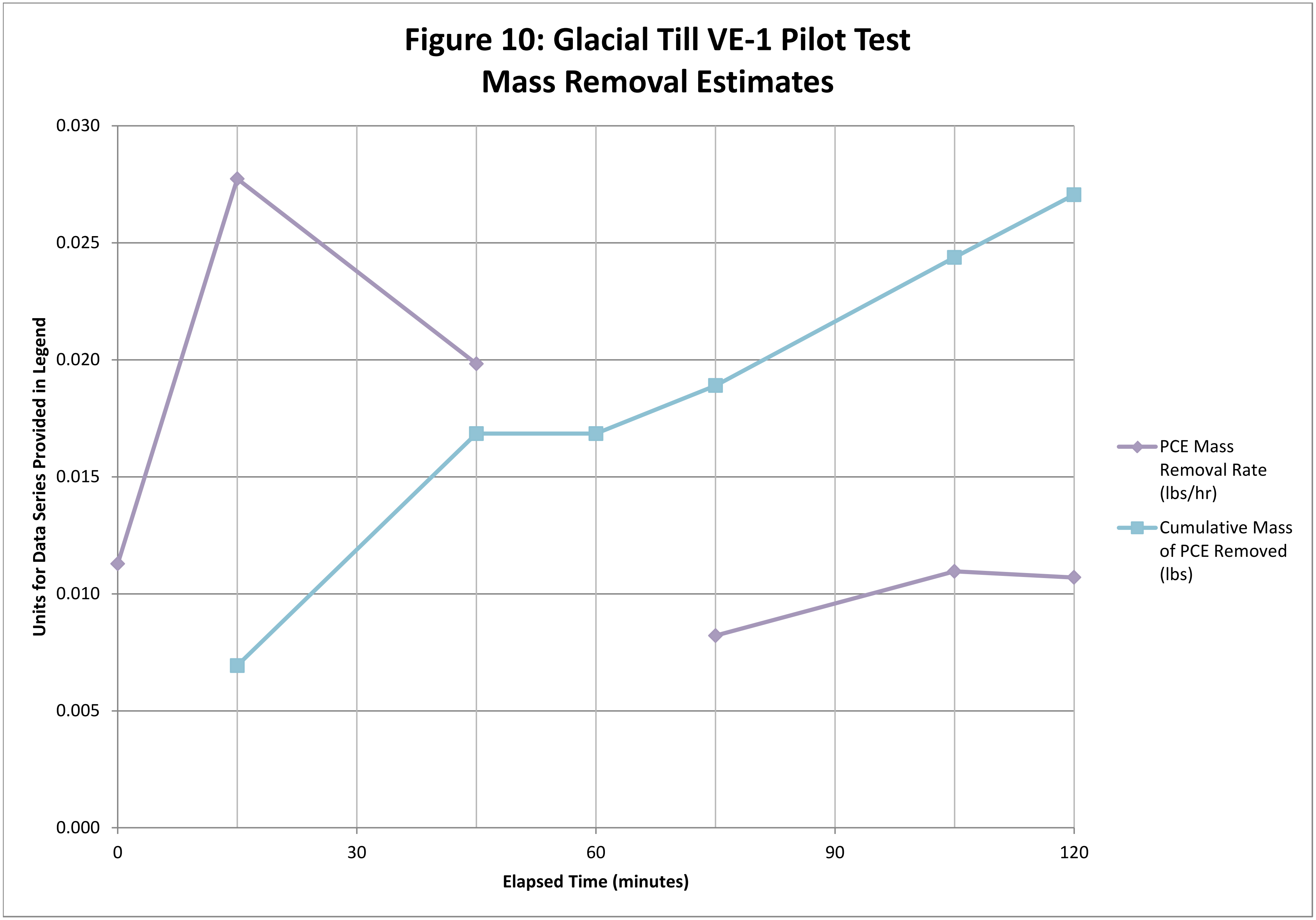
V:\080190 Stadium Thriftway LLC\Deliverables\Construction and Design Report
Morrell's SVE Pilot Test Calcs - Revised 5.15.2014.xlsx - VE1 PT Vacuum Responses

Figure 9
Glacial Till VE-1 Pilot Test
Pressure Responses in SVE Wells



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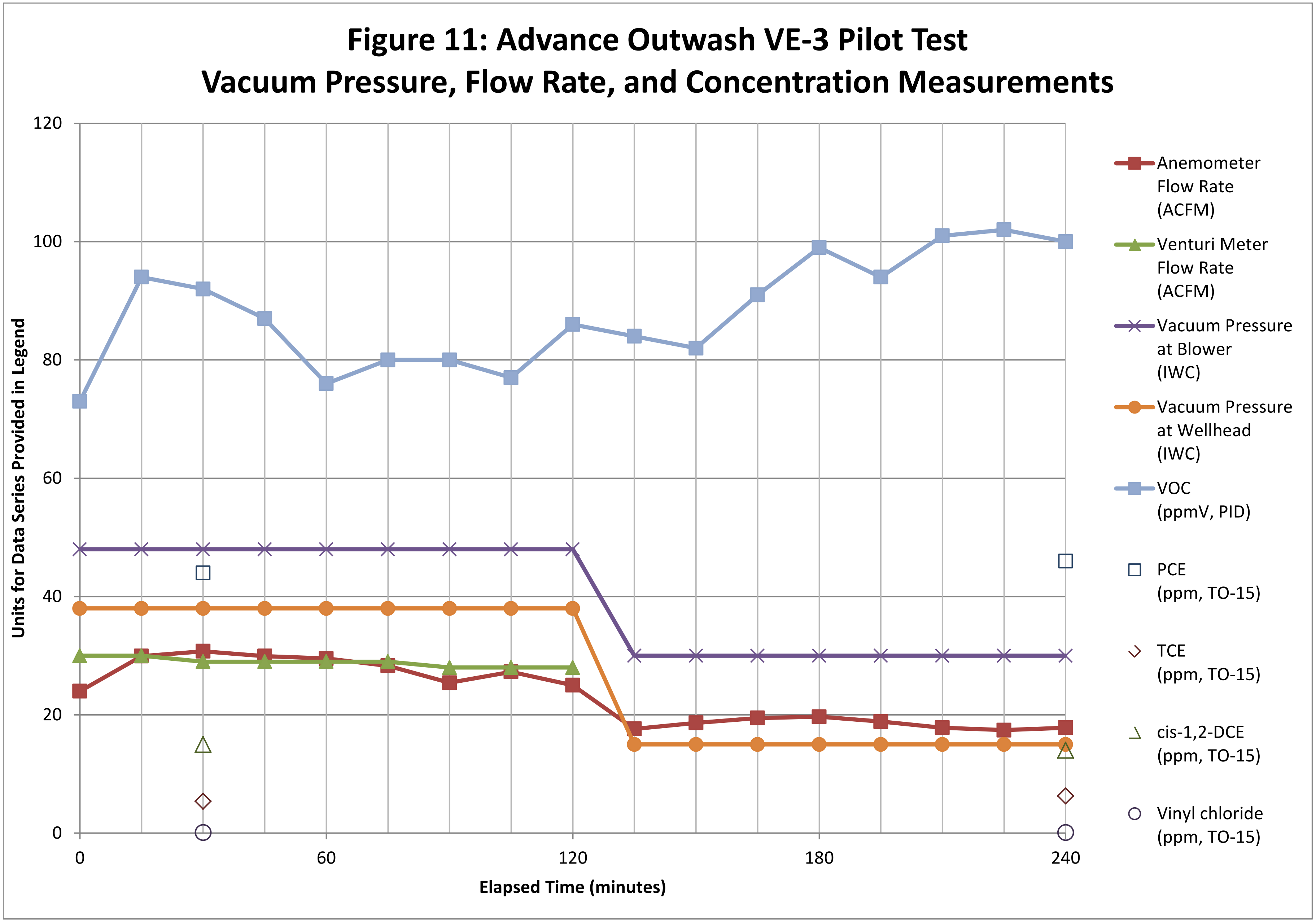
V:\080190 Stadium Thriftway LLC\Deliverables\Construction and Design Report
Morrell's SVE Pilot Test Calcs - Revised 5.15.2014.xlsx - VE1 PT Mass Calcs

Figure 10
Glacial Till VE-1 Pilot Test
Mass Removal Estimates



Aspect Consulting
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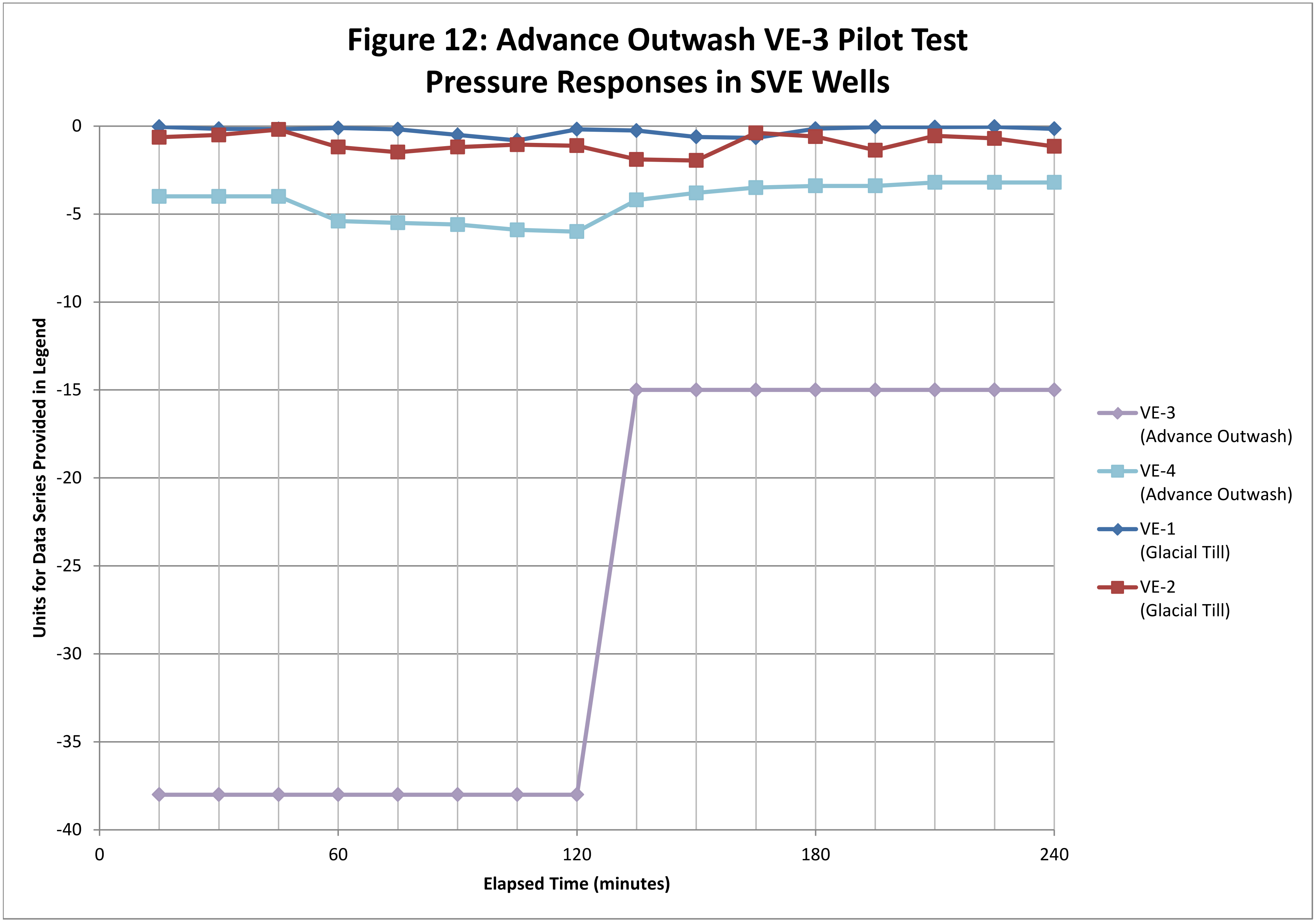
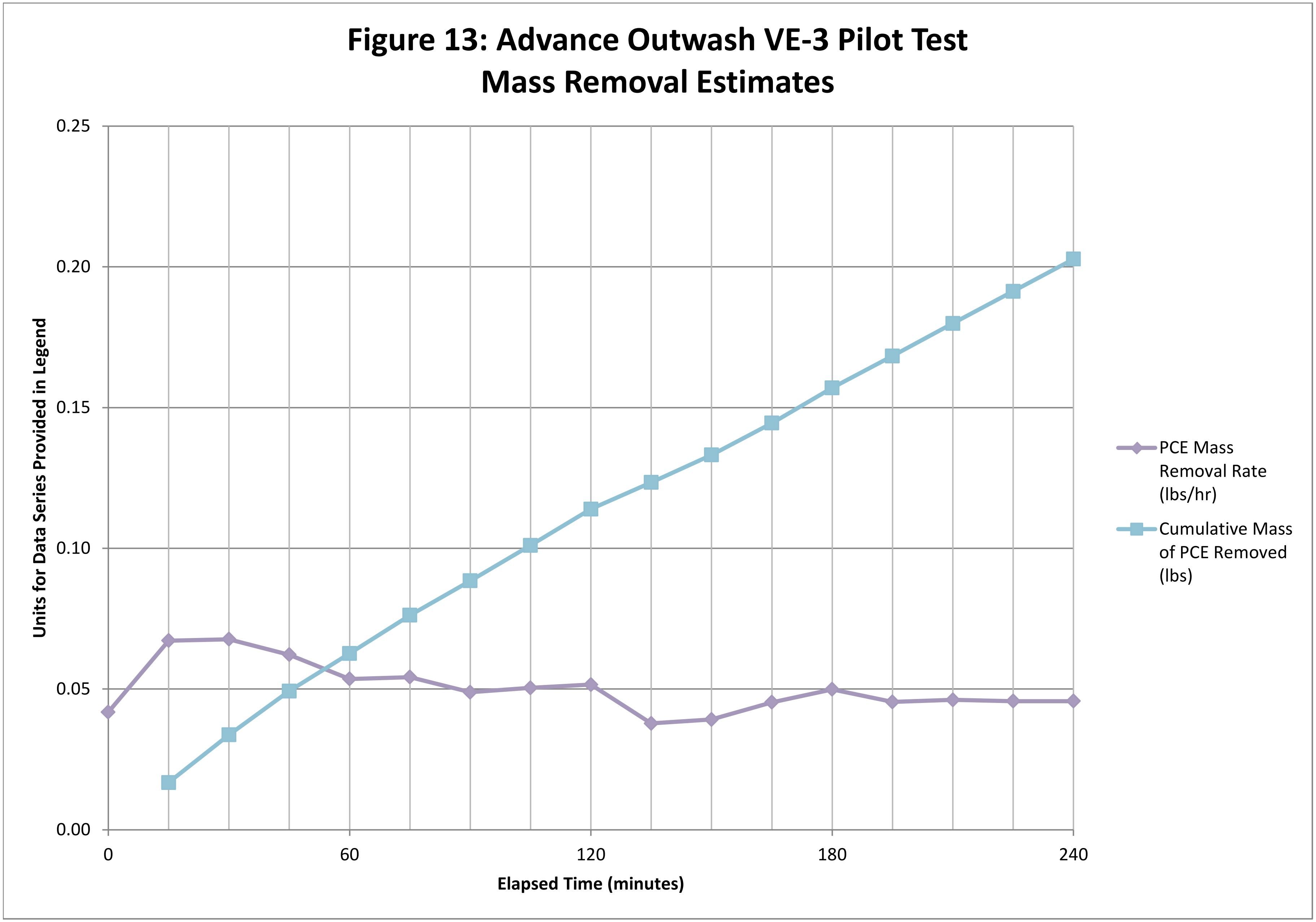
V:\080190 Stadium Thriftway LLC\Deliverables\Construction and Design Report\ Morrell's SVE Pilot Test Calcs - Revised 5.15.2014.xlsx - VE3 PT PTC

Figure 11
Advance Outwash VE-3 Pilot Test
Vacuum Pressure, Flow Rate, and Concentration Measurements



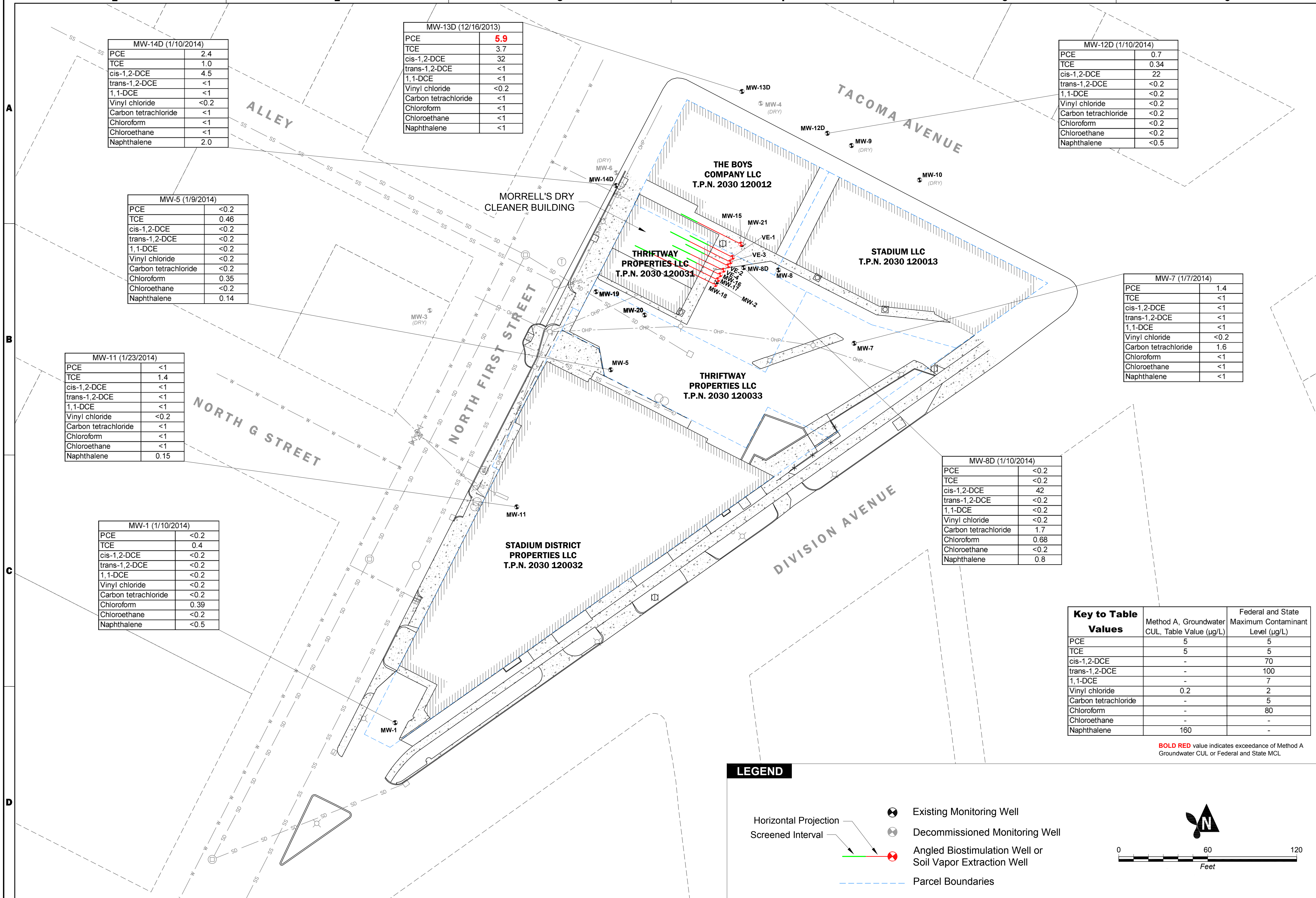
Aspect Consulting
5/16/2014
V:\080190 Stadium Thriftway LLC\Deliverables\Construction and Design Report
Morrell's SVE Pilot Test Calcs - Revised 5.15.2014.xlsx - VE3 PT Vacuum Responses

Figure 12
Advance Outwash VE-3 Pilot Test
Pressure Responses in SVE Wells



Aspect Consulting
5/16/2014
V:\080190 Stadium Thriftway LLC\Deliverables\Construction and Design Report
Morrell's SVE Pilot Test Calcs - Revised 5.15.2014.xlsx - VE3 PT Mass Calcs

Figure 13
Advance Outwash VE-3 Pilot Test
Mass Removal Estimates



MW-14D (1/10/2014)	
PCE	2.4
TCE	1.0
cis-1,2-DCE	4.5
trans-1,2-DCE	<1
1,1-DCE	<1
Vinyl chloride	<0.2
Carbon tetrachloride	<1
Chloroform	<1
Chloroethane	<1
Naphthalene	2.0

MW-13D (12/16/2013)	
PCE	**5.9**
TCE	3.7
cis-1,2-DCE	32
trans-1,2-DCE	<1
1,1-DCE	<1
Vinyl chloride	<0.2
Carbon tetrachloride	<1
Chloroform	<1
Chloroethane	<1
Naphthalene	<1

MW-12D (1/10/2014)	
PCE	0.7
TCE	0.34
cis-1,2-DCE	22
trans-1,2-DCE	<0.2
1,1-DCE	<0.2
Vinyl chloride	<0.2
Carbon tetrachloride	<0.2
Chloroform	<0.2
Chloroethane	<0.2
Naphthalene	<0.5

MW-5 (1/9/2014)	
PCE	<0.2
TCE	0.46
cis-1,2-DCE	<0.2
trans-1,2-DCE	<0.2
1,1-DCE	<0.2
Vinyl chloride	<0.2
Carbon tetrachloride	<0.2
Chloroform	0.35
Chloroethane	<0.2
Naphthalene	0.14

MW-7 (1/7/2014)	
PCE	1.4
TCE	<1
cis-1,2-DCE	<1
trans-1,2-DCE	<1
1,1-DCE	<1
Vinyl chloride	<0.2
Carbon tetrachloride	1.6
Chloroform	<1
Chloroethane	<1
Naphthalene	<1

MW-11 (1/23/2014)	
PCE	<1
TCE	1.4
cis-1,2-DCE	<1
trans-1,2-DCE	<1
1,1-DCE	<1
Vinyl chloride	<0.2
Carbon tetrachloride	<1
Chloroform	<1
Chloroethane	<1
Naphthalene	0.15

MW-8D (1/10/2014)	
PCE	<0.2
TCE	<0.2
cis-1,2-DCE	42
trans-1,2-DCE	<0.2
1,1-DCE	<0.2
Vinyl chloride	<0.2
Carbon tetrachloride	1.7
Chloroform	0.68
Chloroethane	<0.2
Naphthalene	0.8

MW-1 (1/10/2014)	
PCE	<0.2
TCE	0.4
cis-1,2-DCE	<0.2
trans-1,2-DCE	<0.2
1,1-DCE	<0.2
Vinyl chloride	<0.2
Carbon tetrachloride	<0.2
Chloroform	0.39
Chloroethane	<0.2
Naphthalene	<0.5

Key to Table Values	Method A, Groundwater CUL, Table Value (µg/L)	Federal and State Maximum Contaminant Level (µg/L)
PCE	5	5
TCE	5	5
cis-1,2-DCE	-	70
trans-1,2-DCE	-	100
1,1-DCE	-	7
Vinyl chloride	0.2	2
Carbon tetrachloride	-	5
Chloroform	-	80
Chloroethane	-	-
Naphthalene	160	-

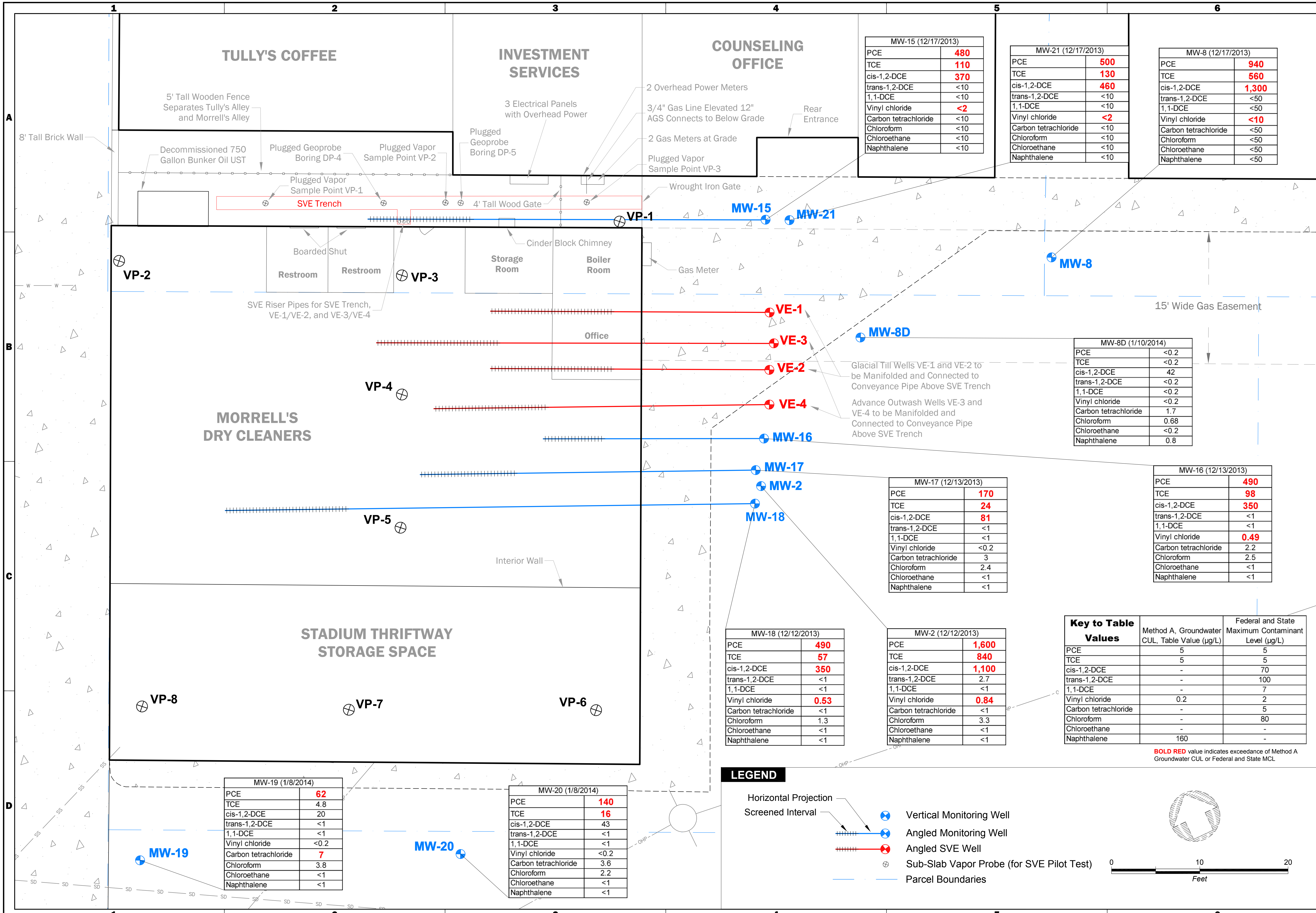
BOLD RED value indicates exceedance of Method A Groundwater CUL or Federal and State MCL

VOCs IN GROUNDWATER OUTSIDE REMEDIATION AREA
MORRELL'S DRY CLEANERS
CONSTRUCTION AND DESIGN REPORT
TACOMA, WASHINGTON

Aspect CONSULTING

DATE: APR 2014
PROJECT NUMBER: 080190
DESIGNED BY: AN
DRAWN BY: SCC

FIGURE NO.
14



MW-15 (12/17/2013)	
PCE	**480**
TCE	**110**
cis-1,2-DCE	**370**
trans-1,2-DCE	<10
1,1-DCE	<10
Vinyl chloride	**<2**
Carbon tetrachloride	<10
Chloroform	<10
Chloroethane	<10
Naphthalene	<10

MW-21 (12/17/2013)	
PCE	**500**
TCE	**130**
cis-1,2-DCE	**460**
trans-1,2-DCE	<10
1,1-DCE	<10
Vinyl chloride	**<2**
Carbon tetrachloride	<10
Chloroform	<10
Chloroethane	<10
Naphthalene	<10

MW-8 (12/17/2013)	
PCE	**940**
TCE	**560**
cis-1,2-DCE	**1,300**
trans-1,2-DCE	<50
1,1-DCE	<50
Vinyl chloride	**<10**
Carbon tetrachloride	<50
Chloroform	<50
Chloroethane	<50
Naphthalene	<50

MW-8D (1/10/2014)	
PCE	<0.2
TCE	<0.2
cis-1,2-DCE	42
trans-1,2-DCE	<0.2
1,1-DCE	<0.2
Vinyl chloride	<0.2
Carbon tetrachloride	1.7
Chloroform	0.68
Chloroethane	<0.2
Naphthalene	0.8

MW-16 (12/13/2013)	
PCE	**490**
TCE	**98**
cis-1,2-DCE	**350**
trans-1,2-DCE	<1
1,1-DCE	<1
Vinyl chloride	**0.49**
Carbon tetrachloride	2.2
Chloroform	2.5
Chloroethane	<1
Naphthalene	<1

MW-17 (12/13/2013)	
PCE	**170**
TCE	**24**
cis-1,2-DCE	**81**
trans-1,2-DCE	<1
1,1-DCE	<1
Vinyl chloride	<0.2
Carbon tetrachloride	3
Chloroform	2.4
Chloroethane	<1
Naphthalene	<1

MW-18 (12/12/2013)	
PCE	**490**
TCE	**57**
cis-1,2-DCE	**350**
trans-1,2-DCE	<1
1,1-DCE	<1
Vinyl chloride	**0.53**
Carbon tetrachloride	<1
Chloroform	1.3
Chloroethane	<1
Naphthalene	<1

MW-2 (12/12/2013)	
PCE	**1,600**
TCE	**840**
cis-1,2-DCE	**1,100**
trans-1,2-DCE	2.7
1,1-DCE	<1
Vinyl chloride	**0.84**
Carbon tetrachloride	<1
Chloroform	3.3
Chloroethane	<1
Naphthalene	<1

MW-19 (1/8/2014)	
PCE	**62**
TCE	4.8
cis-1,2-DCE	20
trans-1,2-DCE	<1
1,1-DCE	<1
Vinyl chloride	<0.2
Carbon tetrachloride	**7**
Chloroform	3.8
Chloroethane	<1
Naphthalene	<1

MW-20 (1/8/2014)	
PCE	**140**
TCE	**16**
cis-1,2-DCE	43
trans-1,2-DCE	<1
1,1-DCE	<1
Vinyl chloride	<0.2
Carbon tetrachloride	3.6
Chloroform	2.2
Chloroethane	<1
Naphthalene	<1

Key to Table Values	Method A, Groundwater CUL, Table Value (µg/L)	Federal and State Maximum Contaminant Level (µg/L)
PCE	5	5
TCE	5	5
cis-1,2-DCE	-	70
trans-1,2-DCE	-	100
1,1-DCE	-	7
Vinyl chloride	0.2	2
Carbon tetrachloride	-	5
Chloroform	-	80
Chloroethane	-	-
Naphthalene	160	-

BOLD RED value indicates exceedance of Method A Groundwater CUL or Federal and State MCL

VOCs IN GROUNDWATER INSIDE REMEDIATION AREA MORRELL'S DRY CLEANERS

CONSTRUCTION AND DESIGN REPORT
TACOMA, WASHINGTON

Aspect CONSULTING

DATE:	REVISION:	PROJECT NUMBER:	DESIGNED BY:	DRAWN BY:	REVISED BY:
APR 2014	-	080190	AN	SCC	-

FIGURE NO.
15

Q:_GeoTech\080190 Stadium Thriftway\2013-12 Engineering Design Report\080190-03.dwg 15-VOCs IN GW-INSIDE REMEDIATION AREA || Coordinate System: NAD 1983 State Plane Washington North FIPS 4601 Feet || Date Saved: Apr 01, 2014 12:04pm || User: scudd

APPENDIX A

SVE and Monitoring Well Boring Logs

MW-1

Holt Drilling A Division of Boart Longyear Company

Resource Protection Well Report

Project Name: BRUCE TITUS CHEV

Well Identification #: ALM-064

Drilling Method: SONIC 6"

Driller: Ken Phillips

License #: 2652

Date: 1-22-07

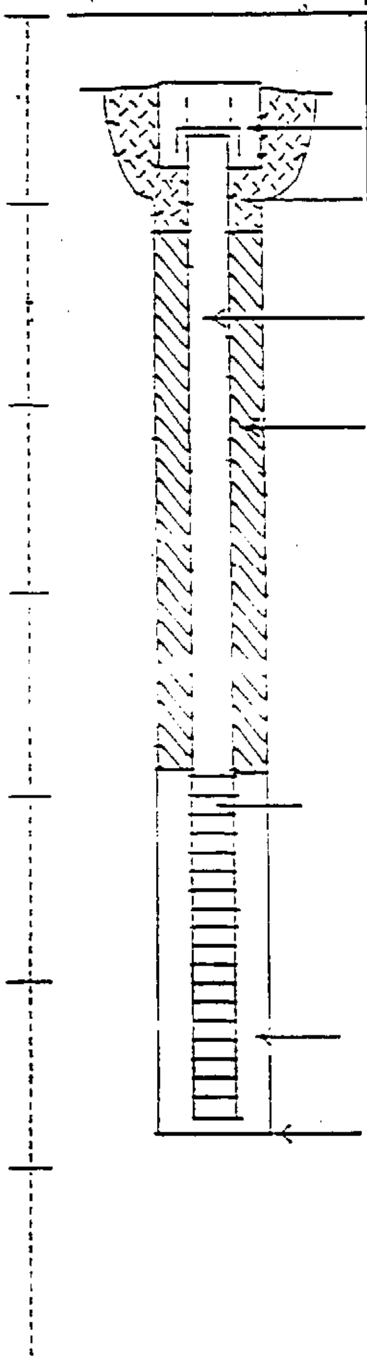
County: PIERCE SE 1/4 SE 1/4

Section: 32 T 21N R 3E

Street Address: 630 STADIUM WY

Start Card: R-70639

Consulting Firm: STEMEN ENV.

AS-BUILT	WELL DATA	FORMATION DESCRPITION
	ALM- MONUMENT: 8" FLUSH CONCRETE SURFACE SEAL: 2 FT RISER: 2"x 60' BACKFILL: ___ FT TYPE: 3/8 CHIPS SCREEN: 2"x 15' TYPE: PVC SLOT SIZE: .020 SAND PACK: 17' MATERIAL: 10x20 SILICA WELL DEPTH: 65'	0-15' FT BROWN SILTY SAND + GRAVEL FILL 20-30% ~~SAND~~ FINES FT 15-50' FT GREY SILTY SAND TO SANDY SILT WITH OCCASSIONAL LARGE GRAVELS VERY DENSE DRY (TILL) FT 50-65 FT ORANGE/BROWN SAND MEDIUM DENSE TO DENSE WET @ 54' TURNING GREY IN COLOR @ 60' FT REMARKS

Signature: K L Phillips

MW-2

Holt Drilling A Division of Boart Longyear Company

Resource Protection Well Report

Project Name: BRUCE TITUS CHEV

Date: 1-22-07

Well Identification #: ALM-069

County: PIERCE SE 1/4 SE 1/4

Drilling Method: SONIC 6"

Section: 32 T: 21N R: 3E

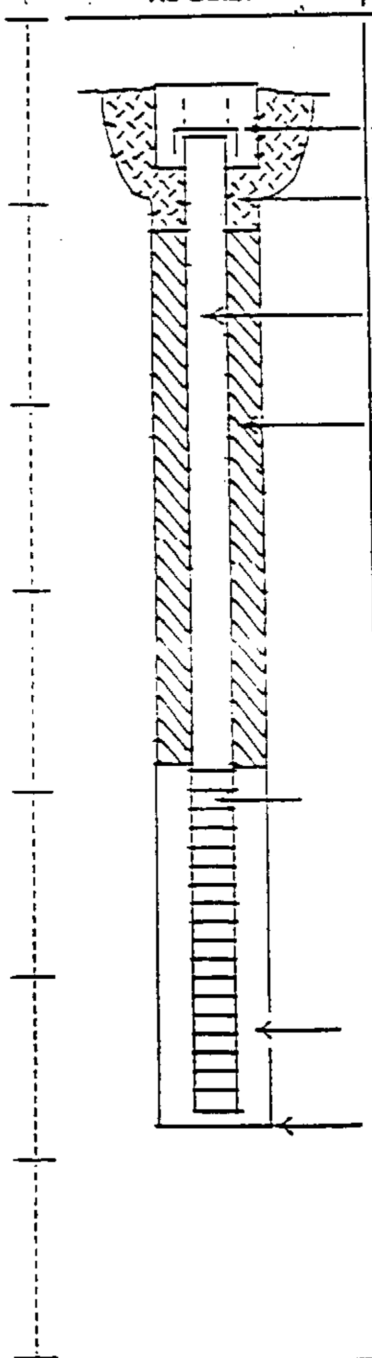
Driller: Ken Phillips

Street Address: 630 STADIUM WY

License #: 2652

Start Card: R-70639

Consulting Firm: STEMEN ENV.

AS-BUILT	WELL DATA	FORMATION DESCRPITION
	ALM-169 MONUMENT: 8" FLUSH CONCRETE SURFACE SEAL: 2 FT RISER: 2"x 50' BACKFILL: FT TYPE: 3/8 CHIPS SCREEN: 2"x 15' TYPE: PVC SLOT SIZE: .020 SAND PACK: 17' MATERIAL: 10x20 SILICA WELL DEPTH: 65'	0-15' FT BROWN SILTY SAND + GRAVEL FILL 20-30% ~~SAND~~ FINES FT 15-50' FT GREY SILTY SAND TO SANDY SILT WITH OCCASSIONAL LAGRE GRAVELS VERY DENSE DRY (TILL) FT 50-65 FT ORANGE/BROWN SAND MEDIUM DENSE TO DENSE WET @ 54' TURNING GREY IN COLOR @ 60' FT REMARKS

Signature: K L Phillips

Holt Drilling A Division of Boart Longyear Company

Resource Protection Well Report

MW-3

Project Name BRUCE TITUS CHEV

Well Identification # ALM-068

Drilling Method SONIC 6"

Driller Ken Phillips

License # 2652

Date 2-1-07

County PIERCE SE 1/4 SE 1/4

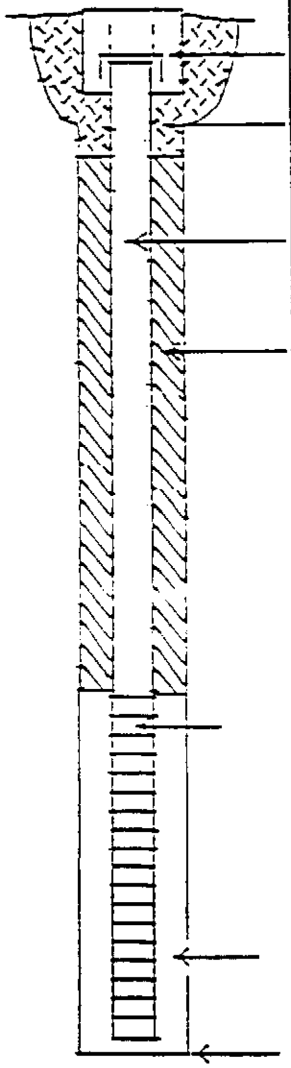
Section 32 T 21N R 3E

Street Address 633 DIVISION

Start Card R70639

Consulting Firm STEMEN ENVIORMENTAL

AS-BUILT	WELL DATA	FORMATION DESCRPITION



WELL DATA

- MONUMENT: 8' FLUSH
- CONCRETE SURFACE SEAL: 2 FT
- RISER: 2"x 52'
- BACKFILL: 48 FT
  TYPE: 3/8" CHIPS
- SCREEN: 2"x 15'
  TYPE: FACTORY FLUSH
  SLOT SIZE: .020
- SAND PACK: 17'
  MATERIAL: 10x20 SILICA
- WELL DEPTH: 67'

FORMATION DESCRPITION

0-3 FT
2" ASPHALT BROWN COARSE SAND + GRAVEL 20-30% FINES (FILL)

FT

3-54 FT
GREY TO BROWN SILTY FINE SAND VERY DENSE DRY OCC GRAVE 20-30% FINES (TILL)

54-65 FT
MOIST BROWN SAND MEDIUM DENSE 10-15% FINES

65-67' FT
GREY VERY DENSE GREY SILTY FINE SAND WITH GRAVELS (TILL)

FT

REMARKS

Signature

BOART LONGYEAR E & I

MW-4

Resource Protection Well Report

Project Name: Stadium Thriftway

Well Identification #: BAM 164

Drilling Method: Sonic

Driller: Thomas W. Croney

License #: 2409

Date: 1/9/08

County: Pierce, NE ¼ SE ¼

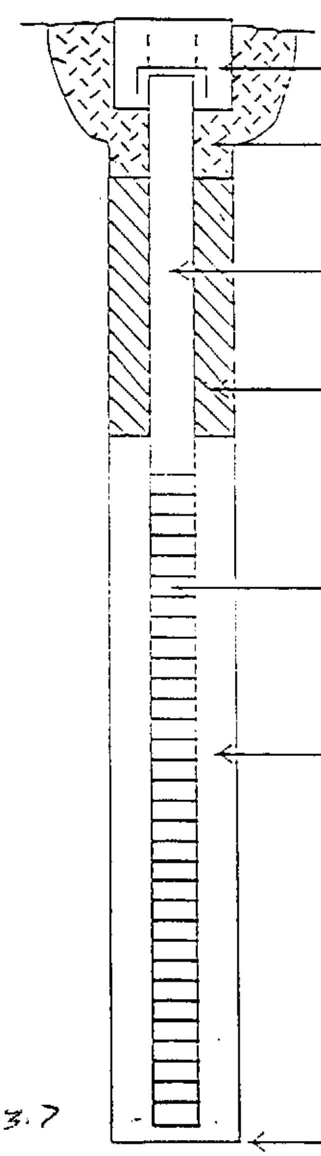
Section: 32 T. 21N R. 3E

Street Address: N 1st N Tacoma Ave

Start Card: R 70843

Consulting Firm: Stemen ENV

AS-BUILT



2

45

45

63.7

WELL DATA

MONUMENT TYPE: flush

CONCRETE SURFACE SEAL: 1.5 ft

PVC BLANK: 2 x 48

39 - Neat cement

BACKFILL: 4 feet

TYPE: Benton

PVC SCREEN: 2 inch 15 feet

SLOT SIZE: 10

TYPE: flush thread

GRAVEL PACK: 18 ft

MATERIAL: 1020 silica

WELL DEPTH: 63.7 ft

FORMATION DESCRIPTION

0 - 52 ft.

Med Brn till

V. Dense

52 - 61 ft.

compact Sand. Lt Brn gravel

61 - 65 ft

compact grey till

- ft.

- ft.

REMARKS

Signature: Thomas W. Croney

BOART LONGYEAR E & I

MW-5

Resource Protection Well Report

Project Name: Stadium Thriftway

Well Identification #: BAN 168

Drilling Method: Sonic

Driller: Thomas Craney

License #: 2409

Date: 1-11-08

County: Pierce, NW ¼ SE ¼

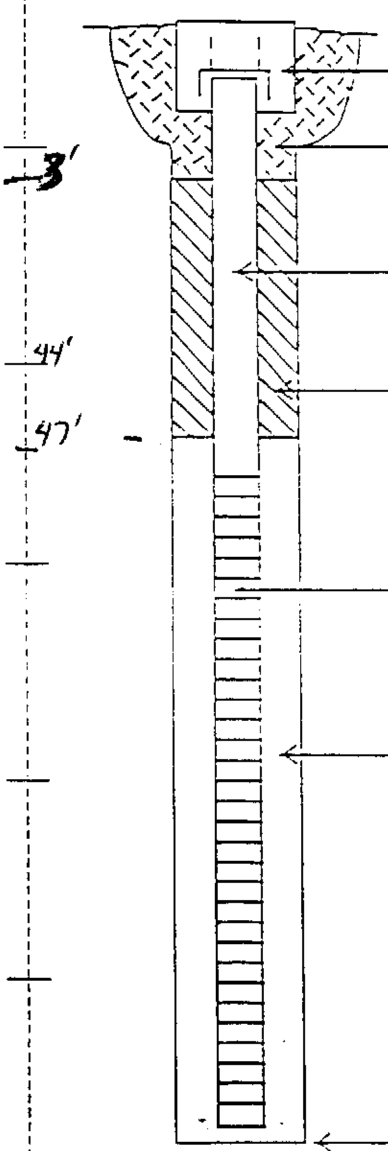
Section: 32 T. 21 N R. 3E

Street Address: N. 1st ST & N. Tacoma AVE

Start Card: R 70822

Consulting Firm: Stemen Env.

AS-BUILT	WELL DATA	FORMATION DESCRIPTION



WELL DATA

MONUMENT TYPE: flush

CONCRETE SURFACE SEAL: 3 ft.

PVC BLANK: 2 x 50

BACKFILL: 44 ft.

TYPE: Bentonite

PVC SCREEN: 2 x 15

SLOT SIZE: 10

TYPE: flush Thread

GRAVEL PACK: 18 ft.

MATERIAL: 10x20 Silica

WELL DEPTH: 65

FORMATION DESCRIPTION

0 - 30 ft.
med Brn consolidated sand med. gruls

30 - 42 ft.
med - dK Brn course sand weT

42 - 57 ft.
med Brn TiLL

57 - 63 ft.
med Brn course sand - weT

63 - 65 ft.
med Brn TiLL

REMARKS

Signature: Thomas W. Craney

BOART LONGYEAR E & I

MW-6

Resource Protection Well Report

Project Name: Stadium Thriftway

Well Identification #: BAM 167

Drilling Method: Sonic

Driller: Thomas Craney

License #: 2409

Date: 1-16-08

County: Pierce, NW ¼ SE ¼

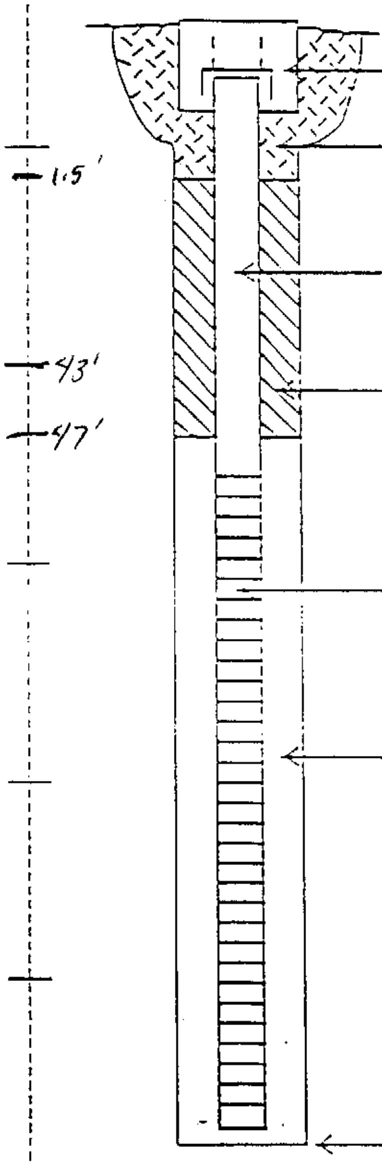
Section: 32 T. 21 N R. 3E

Street Address: N 1st + N Tacoma Ave

Start Card: R70822

Consulting Firm: Stemen Env.

AS-BUILT	WELL DATA	FORMATION DESCRIPTION



MONUMENT TYPE: flush

CONCRETE SURFACE SEAL: 1 ft.

PVC BLANK: 2 x 49'
neet cement 41'

BACKFILL: 4 ft.
TYPE: Bentonite

PVC SCREEN: 2 x 15'
SLOT SIZE: .20
TYPE: Flush Thread

GRAVEL PACK: 17 ft.
MATERIAL: 10x20 Cilica

WELL DEPTH: 64.2

0 - 1 ft.
Asphalt - Road Base

1 - 60 ft.
Compact sand
grvl med Brn
V. Dense

60 - 65 ft.
Med - DK Brn
sand

 - ft.

 - ft.

REMARKS

Signature: Thomas W. Craney

Holt Drilling A Division of Boart Longyear Company

Resource Protection Well Report

MW-7

Project Name STADIUM THRIFTWAY

Well Identification # BAM-111

Drilling Method SONIC 4x6"

Driller Ken Phillips

License # 2652

Date 1-18-08

County PIERCE NW 1/4 SE 1/4

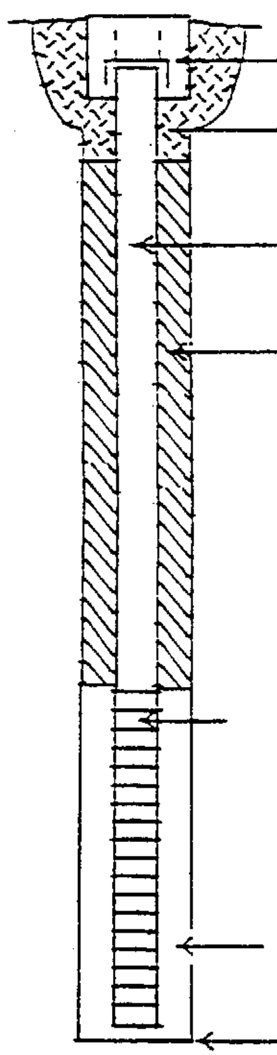
Section 32 **T** 21N **R** 3E

Street Address N. 1st St + Tac Ave

Start Card R70822

Consulting Firm STEMEN ENVIRONMENTAL

AS-BUILT	WELL DATA	FORMATION DESCRPITION



WELL DATA

BAM-111

MONUMENT: 8" FLUSH

CONCRETE SURFACE SEAL: 2 **FT**

RISER: 2 "x 50 '

BACKFILL: ____ **FT**

TYPE: 3/4 CHIPS

SCREEN: 2 "x 15 '

TYPE: FACTORY FLUSH

SLOT SIZE: .020

SAND PACK: 18 '

MATERIAL: 10x20 SILICA

WELL DEPTH: 65 '

FORMATION DESCRPITION

0-1' **FT**
ASPHALT + BROWN SAND AND GRAVEL ROADBASE

1-50' **FT**
BROWN SILTY SAND WITH LARGE GRAVELS VERY DENSE ~~WET~~ MOIST SAND @ 25'
(TILL) ____ **FT**

50-65 **FT**
BROWN OXIDIZED SAND MEDIUM WET @ 55'

____ **FT**

____ **FT**

REMARKS ____

Signature [signature]

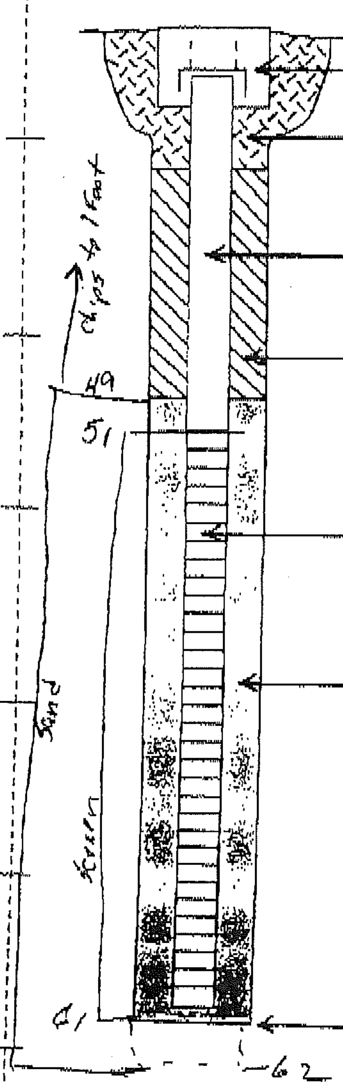
MW-8

BOART LONGYEAR

Resource Protection Well Report

Project Name: Titus
Well Identification #: BA 5078
Drilling Method: Sonic
Driller: Brian Owens
License #: 2997

Date: 4/17/08
County: Pierce NW 1/4 SE 1/4
Section: 32 T. 21N R. 3E
Street Address: N 1st N Tacoma Ave
Start Card: R 70843
Consulting Firm: Stemen

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	MONUMENT TYPE: flush	0 - 15 ft. BROWN SILTY SAND & GRAVELLY FILL
	CONCRETE SURFACE SEAL 1 ft.	ft.
	PVC BLANK 55 "x 2"	
	BACKFILL 49 ft. TYPE: 3/4 ben chips	15 - 50 ft. GRAY SILTY SANDS INTERMIXED WITH MEDIUM/LARGE GRAVELS
	PVC SCREEN 10 "x 2" SLOT SIZE: .10 TYPE: PVC	50 - 60 ft. RUST/BROWN COLORED SAND MEDIUM DENSE/DENSE, WET AT 54 1/2 FT.
	GRAVEL PACK 49 ft. MATERIAL: Silica Sand	60 - 65 ft. GRAY COLORED SANDS MEDIUM DENSE.
	WELL DEPTH 61'	**REMARKS**

Signature: Brian Owens

VAV038.CDR

Monitoring Well Construction Log

Aspect CONSULTING	Project Number	Well Number	Sheet
	080190	MW-8D	1 of 3

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Boart Longyear / Spider Sonic
Sampling Method: Continuous Core

Ground Surface Elev. 273.5
Top of Casing Elev. 273.11
Depth to Water - 5/11/2009
Start/Finish Date 5/4/2009 - 5/6/2009

Depth (feet)	Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
0	273	Flushmount monument, lockable thermos cap, concrete seal 0'-1'						Blacktop and concrete.	
1–3	272–270							Vacuumed to 3'.	1–3
3	270							Very hard, slightly moist, light brown, slightly sandy, gravelly SILT (ML); fine sand; coarse to fine gravel, subrounded.	3
8	265							Grades to sandy.	8
10	263	2" diameter, schedule 40 PVC, threaded connections, 0'-96'							10
11	262							Very hard, brown, slightly gravelly, silty SAND (SM); fine gravel, rounded.	11
20	253	Hydrated bentonite chips, 1'-92'							20
21	252							Gravelly.	21
24	249							Slightly gravelly.	24
29	244							Hard, brown, slightly gravelly, very sandy SILT (ML); fine gravel, rounded.	29
33	240							Hard, brown, slightly gravelly, very silty SAND (SM); fine gravel, rounded.	33
37	236							Moist, red-brown, slightly silty SAND (SP); medium sand.	37
40	233							Trace gravel.	40
49	224								49

Sampler Type:
No Recovery
Continuous Core

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: DFR
Approved by: ALN
Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-8D	2 of 3

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Boart Longyear / Spider Sonic
Sampling Method: Continuous Core

Ground Surface Elev. 273.5
Top of Casing Elev. 273.11
Depth to Water - 5/11/2009
Start/Finish Date 5/4/2009 - 5/6/2009

Depth / Elevation (feet)		Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Description	Depth (ft)
	223							
51	222							51
52	221							52
53	220							53
54	219							54
55	218	5/4/2009						55
56	217						Wet.	56
57	216							57
58	215							58
59	214							59
60	213							60
61	212							61
62	211							62
63	210							63
64	209							64
65	208	10/20 sand filter pack, 92'-120'					Brown.	65
66	207						Very hard, moist, brown, sandy, silty GRAVEL (GM); non-plastic.	66
67	206							67
68	205							68
69	204							69
70	203							70
71	202							71
72	201							72
73	200						Brown, slightly gravelly, very silty SAND (SM); non-plastic.	73
74	199							74
75	198							75
76	197							76
77	196						Dark blue, slightly sandy SILT (ML); trace gravel.	77
78	195							78
79	194							79
80	193							80
81	192							81
82	191						Dry, gray, silty, very gravelly SAND (SM); fine sand.	82
83	190							83
84	189							84
85	188							85
86	187							86
87	186						Trace cobbles, subrounded.	87
88	185							88
89	184							89
90	183							90
91	182							91
92	181							92
93	180	2" diameter, 10-slot, schedule 40 PVC screen, 96'-106'					Very hard, dry, blue gray, sandy, very silty GRAVEL (GM).	93
94	179							94
95	178							95
96	177							96
97	176							97
98	175						Loose, slightly moist, brown, gravelly, very silty SAND (SM).	98
99	174							99

Sampler Type:
No Recovery
Continuous Core

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: DFR
Approved by: ALN
Figure No.

_MONITORING WELL STADIUM THRIFTWAY.GPJ February 7, 2014

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-8D	3 of 3

Project Name:	Morrell's Dry Cleaners	Ground Surface Elev.	273.5
Location:	608 North 1st Street, Tacoma, WA	Top of Casing Elev.	273.11
Driller/Method:	Boart Longyear / Spider Sonic	Depth to Water	- 5/11/2009
Sampling Method:	Continuous Core	Start/Finish Date	5/4/2009 - 5/6/2009

Depth (feet)	Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
101	173								101
102	172							Hard, dry, dark blue gray, gravelly, sandy SILT (ML).	102
103	171								103
104	170								104
105	169								105
106	168							Hard, dry, light gray, silty, very gravelly SAND (SM); fine sand; fine to coarse gravel.	106
107	167								107
108	166								108
109	165								109
110	164								110
111	163							Loose, wet, brown, slightly silty SAND (SP); fine sand.	111
112	162	5/11/2009							112
113	161								113
114	160								114
115	159							Hard, dry, light gray, silty, very gravelly SAND (SM); fine sand.	115
116	158	Threaded PVC endcap							116
117	157								117
118	156								118
119	155								119
120	154							Boring terminated 120 ft BGS. Depth to perched water was 55 ft BGS ATD. Depth to water table at 112.56 ft BGS on 5/11/2009.	120
121	153								121
122	152								122
123	151								123
124	150								124
125	149								125
126	148								126
127	147								127
128	146								128
129	145								129
130	144								130
131	143								131
132	142								132
133	141								133
134	140								134
135	139								135
136	138								136
137	137								137
138	136								138
139	135								139
140	134								140
141	133								141
142	132								142
143	131								143
144	130								144
145	129								145
146	128								146
147	127								147
148	126								148
149	125								149
	124								

Sampler Type:

No Recovery

Continuous Core

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: DFR

Approved by: ALN

Figure No.

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
080190	MW-9	1 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Boart Longyear / Spider Sonic
Sampling Method: Continuous Core

Ground Surface Elev. 274.5
Top of Casing Elev. 273.78
Depth to Water - 5/11/2009
Start/Finish Date 5/5/2009

Depth (ft)	Elevation (feet)	Borehole Completion	Description
0–1	274	Flushmount monument, lockable thermos cap	Blacktop and concrete.
1–5	273–270		Vacuumed to 5'.
5	269		Slightly moist, gray blue, gravelly, sandy SILT (ML).
10	264	Quickrite portland cement, 0'-30'	Dry, lightly brown, very gravelly.
11	263		Brown, slightly moist, gravelly, silty SAND (SM).
16	258		Dry, light gray.
20	254	2" diameter, schedule 40 PVC, threaded connections, 0'-60'	
22	252		Very dense, slightly moist, gray blue.
26	248		Dry, dark gray blue, sandy SILT (ML), trace gravel.
28	246		Slightly moist, brown, gravelly, very silty SAND (SM); fine to medium sand, predominantly fine.
32	242		Grades to trace gravel.
34	240		Moist.
35	239	Hydrated bentonite chips, 30'-57'	
38	236		Very gravelly.
40	234		Trace gravel.
42	232		Loose, moist, dark brown-red SAND (SP), trace gravel; fine to medium sand, predominantly fine; fine gravel, subrounded.
47	227		Grades to slightly silty.

Column headings also printed: Sample Type/ID, Tests, PID (ppm), Blows/6", Material Type, Depth (ft).

Sampler Type:
No Recovery
Continuous Core

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: DFR
Approved by: ALN
Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-9	2 of 2

Project Name:	Morrell's Dry Cleaners	Ground Surface Elev.	274.5
Location:	608 North 1st Street, Tacoma, WA	Top of Casing Elev.	273.78
Driller/Method:	Boart Longyear / Spider Sonic	Depth to Water	- 5/11/2009
Sampling Method:	Continuous Core	Start/Finish Date	5/5/2009

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51 / 224–223								51
52 / 222	Hydrated bentonite chips, 30'-57'						Grades to gravelly.	52
53–54 / 221–220	5/5/2009						Wet.	53–54
55–56 / 219–218								55–56
57 / 217							No gravel.	57
58 / 216	10/20 sand filter pack, 57'-70'							58
59–63 / 215–211								59–63
64–65 / 210–209	2" diameter, 10-slot, schedule 40 PVC screen, 60'-70'							64–65
66–69 / 208–205								66–69
70 / 204	Threaded PVC endcap						Boring terminted 70' BGS. Depth to water was 54 ft BGS ATD. Well was dry on 5/11/2009.	70
71–99 / 203–175								71–99

Sampler Type:
- No Recovery
- Continuous Core

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: DFR

Approved by: ALN

Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-10	1 of 2

Project Name:	Morrell's Dry Cleaners	Ground Surface Elev.	275
Location:	608 North 1st Street, Tacoma, WA	Top of Casing Elev.	274.45
Driller/Method:	Boart Longyear / Spider Sonic	Depth to Water	- 5/11/2009
Sampling Method:	Continuous Core	Start/Finish Date	5/7/2009

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
1 - 274	Flushmount monument, lockable thermos cap						Blacktop and concrete.	1
2 - 273							Medium dense, wet, dark brown, slightly silty, very gravelly SAND (SP); fine to coarse sand; fine to coarse gravel, rounded.	2
3 - 272								3
4 - 271							Medium dense, mosit, gray purple, silty, very gravelly SAND (SM); fine to coarse sand; fine to coarse gravel, subrounded.	4
5 - 270								5
6 - 269							Dry to slightly moist, brown to dark brown.	6
7 - 268							Loose, moist, dark brown, slightly silty, gravelly SAND (SP); predominantly medium to coarse sand; fine gravel, subrounded.	7
8 - 267								8
9 - 266							Medium dense, dry to slightly moist, fine to coarse gravel.	9
10 - 265								10
11 - 264							Very dense, dry, gray purple boulder.	11
12 - 263							Medium dense, slightlymoist, yellow-red to dark brown, gravelly, very silty SAND (SM); fine to coarse sand; fine to coarse gravel, subrounded.	12
13 - 262								13
14 - 261							Very stiff, dry to slightly moist, brown, gravelly, very sandy SILT (ML); fine to coarse sand; fine to coarse gravel, subrounded.	14
15 - 260	Quickrite portland cement, 0'-41'							15
16 - 259								16
17 - 258							Medium dense, slightlymoist, dark brown, silty, very gravelly SAND (SP); fine to coarse sand; fine to coarse gravel, subrounded.	17
18 - 257								18
19 - 256							Medium dense, slightly moist, dark brown, slightly silty, very gravelly SAND (SP); predominantly medium to coarse sand; fine to coarse gravel, subrounded.	19
20 - 255								20
21 - 254								21
22 - 253							Dense, dry to slightly moist, yellow-red to dark brown, silty, sandy GRAVEL (GM); fine to coarse sand; fine to coarse gravel, subrounded.	22
23 - 252								23
24 - 251							Medium dense, dry to slightly moist, yellow-red to dark brown, slightly silty, gravelly to very gravelly SAND (SP); predominantly medium to coarse sand; fine to coarse gravel, subrounded, increasing gravel with depth.	24
25 - 250	2" diameter, schedule 40 PVC, threaded connections, 0'-60'							25
26 - 249								26
27 - 248								27
28 - 247							Medium dense, dry to slightly moist, yellow-red to dark brown, silty, very gravelly SAND (SM); fine to coarse sand; fine gravel, subangular to subrounded.	28
29 - 246								29
30 - 245							Gradational decrease in silt. Becomes slightly silty, very gravelly SAND (SP).	30
31 - 244								31
32 - 243							Loose to medium dense, gravelly.	32
33 - 242								33
34 - 241							Medium dense, slightly moist, yellow-red, silty, very gravelly SAND (SM); fine to coarse sand; fine to coarse gravel, subrounded.	34
35 - 240								35
36 - 239							Loose, very silty, no gravel.	36
37 - 238							Medium dense, red-brown, gravelly.	37
38 - 237								38
39 - 236							Loose, slightly moist, yellow-red, slightly silty SAND (SP), trace gravel; perdominantly medium sand.	39
40 - 235							Medium dense to dense, gravelly; fine to coarse gravel, subrounded.	40
41 - 234								41
42 - 233								42
43 - 232								43
44 - 231								44
45 - 230	Hydrated bentonite chips, 41'-56'11"							45
46 - 229							Slightly gravelly; fine gravel.	46
47 - 228								47
48 - 227							Gravelly lense.	48
49 - 226								49
							Gravelly lense.	

Sampler Type:

No Recovery

Continuous Core

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: JMS

Approved by: ALN

Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-10	2 of 2

Project Name:	Morrell's Dry Cleaners	Ground Surface Elev.	275
Location:	608 North 1st Street, Tacoma, WA	Top of Casing Elev.	274.45
Driller/Method:	Boart Longyear / Spider Sonic	Depth to Water	- 5/11/2009
Sampling Method:	Continuous Core	Start/Finish Date	5/7/2009

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51 - 224	Hydrated bentonite chips, 41'-56'11"						Loose, moist. perdominantly medium to coarse sand.	51
52 - 223								52
53 - 222								53
54 - 221								54
55 - 220	5/7/2009						Medium dense, wet, trace gravel; predominantly medium sand; fine gravel.	55
56 - 219								56
57 - 218							Red-brown with black staining, slightly gravelly.	57
58 - 217	10/20 sand filter pack, 56'11"-70'							58
59 - 216							Black, fine to medium sand.	59
60 - 215							Loose to medium dense, very moist to wet, brown SAND (SP); no silt, no gravel.	60
61 - 214								61
62 - 213								62
63 - 212								63
64 - 211	2" diameter, 10-slot, schedule 40 PVC screen, 60'-70'							64
65 - 210								65
66 - 209								66
67 - 208								67
68 - 207							Medium dense, wet, red-brown, slightly clayey; fine to medium sand.	68
69 - 206								69
70 - 205	Threaded PVC endcap						Medium dense, wet, red-brown, slightly gravelly, clayey SAND (SC); predominantly fine to medium sand; fine gravel.	70
71 - 204								71
72 - 203	Natural backfill, 70'-75'						Medium dense, wet, dark brown, silty, gravelly SAND (SM); fine to coarse sand; fine gravel to cobbles, subrounded.	72
73 - 202								73
74 - 201								74
75 - 200							Medium dense, wet, dark brown to gray, slightly silty, very sandy GRAVEL (GP); fine to coarse sand; fine to coarse gravel, subrounded.	75
76 - 199								76
77 - 198							Boring terminated 75 ft BGS. Depth to water was 55 ft BGS ATD. Well was dry on 5/11/2009.	77
78 - 197								78
79 - 196								79
80 - 195								80
81 - 194								81
82 - 193								82
83 - 192								83
84 - 191								84
85 - 190								85
86 - 189								86
87 - 188								87
88 - 187								88
89 - 186								89
90 - 185								90
91 - 184								91
92 - 183								92
93 - 182								93
94 - 181								94
95 - 180								95
96 - 179								96
97 - 178								97
98 - 177								98
99 - 176								99

Sampler Type:

No Recovery

Continuous Core

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: JMS

Approved by: ALN

Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-11	1 of 2

Project Name:	Morrell's Dry Cleaners	Ground Surface Elev.	274
Location:	608 North 1st Street, Tacoma, WA	Top of Casing Elev.	273.52
Driller/Method:	Boart Longyear / Spider Sonic	Depth to Water	- 5/12/2009
Sampling Method:	Continuous Core	Start/Finish Date	5/8/2009

Depth (feet)	Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
		Flushmount monument, lockable thermos cap, concrete seal 0'-1'						Concrete.	
1	273							Wet, light brown, silty, very gravelly SAND (SM); fine to coarse gravel, subround to subangular.	1
2	272								2
3	271								3
4	270							Slightly moist, very silty.	4
5	269								5
6	268							Wet, grades to gravelly, very silty SAND (SM); fine to coarse sand.	6
7	267								7
8	266							Very dense, very silty, very sandy GRAVEL (GM); cobbles.	8
9	265								9
10	264	2" diameter, schedule 40 PVC, threaded connections, 0'-53'						Slightly moist, brown, silty, sandy GRAVEL (GM); fine to coarse sand; fine to coarse gravel.	10
11	263								11
12	262							Grades to brown-gray.	12
13	261								13
14	260							Gray, very silty.	14
15	259							Very moist, brown, silty, very sandy GRAVEL (GM).	15
16	258							Very hard, very moist, dark gray, gravelly, very silty SAND (SM) with sandy silt interbeds	16
17	257								17
18	256								18
19	255								19
20	254	Hydrated bentonite chips, 1'-49'11"						Dry, gray, silty, very sandy GRAVELLY (GM); fine to coarse sand; fine to coarse gravel.	20
21	253								21
22	252								22
23	251							Brown.	23
24	250							Dry, brown, trace to slightly silty, very sandy GRAVEL (GP).	24
25	249								25
26	248							Gray, sandy.	26
27	247								27
28	246							Moist, gray, sandy, very silty GRAVEL (GM).	28
29	245							Brown, silty, very sandy.	29
30	244							Very moist, red-brown to dark brown, slightly gravelly, very silty SAND (SM).	30
31	243								31
32	242								32
33	241							Trace gravel.	33
34	240								34
35	239								35
36	238							Very moist, red-brown to dark brown, slightly gravelly, slightly silty SAND (SM).	36
37	237							Interbedded red-brown, very silty SAND and gray, very sandy SILT (SM/ML)	37
38	236								38
39	235								39
40	234							Very moist, red-brown, slightly silty to silty SAND (SM), trace gravel; fine to medium sand, fine gravel.	40
41	233								41
42	232								42
43	231							Very moist, redish brown, slightly silty, gravelly SAND with interbeds of silty to very silty SAND (SP-SM). Sand is fine to medium.	43
44	230								44
45	229								45
46	228								46
47	227							Brown gray, silty SAND interbedded with sandy SILT (SM-ML).	47
48	226							Dark brown, predominately medium sand.	48
49	225	5/8/2009							49

Sampler Type:

No Recovery

Continuous Core

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: JTL

Approved by: ALN

Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-11	2 of 2

Project Name:	Morrell's Dry Cleaners	Ground Surface Elev.	274
Location:	608 North 1st Street, Tacoma, WA	Top of Casing Elev.	273.52
Driller/Method:	Boart Longyear / Spider Sonic	Depth to Water	- 5/12/2009
Sampling Method:	Continuous Core	Start/Finish Date	5/8/2009

Depth (feet)	Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51	223	10/20 sand filter pack, 49'11"-63'						Wet.	51
52	222	5/12/2009							52
53	221							Gravelly.	53
54	220							Trace gravel to slightly gravelly.	54
55	219	2" diameter, 10-slot, schedule 40 PVC screen, 53'-63'						Wet, red-brown, interbedded silty SAND and slightly silty SAND (SM).	55
56	218								56
57	217								57
58	216								58
59	215								59
60	214							Wet, brown, silty SAND (SM); fine sand.	60
61	213								61
62	212							Wet, brown, slightly silty, gravelly SAND (SP); fine to coarse sand.	62
63	211	Threaded PVC endcap						Slightly moist, gray, very sandy, very silty GRAVEL (GM).	63
64	210								64
65	209							Moist, brown.	65
66	208							Slightly moist, light brown, sandy.	66
67	207								67
68	206							Grades to slightly moist, gray, slightly sandy, gravelly SILT (ML); with wood.	68
69	205	Natural backfill, 63'-70'							69
70	204							Boring terminated 70 ft BGS. Depth to water was 52.20 ft BGS on 5/12/2009.	70
71	203								71
72	202								72
73	201								73
74	200								74
75	199								75
76	198								76
77	197								77
78	196								78
79	195								79
80	194								80
81	193								81
82	192								82
83	191								83
84	190								84
85	189								85
86	188								86
87	187								87
88	186								88
89	185								89
90	184								90
91	183								91
92	182								92
93	181								93
94	180								94
95	179								95
96	178								96
97	177								97
98	176								98
99	175								99

Sampler Type:

No Recovery

Continuous Core

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: JTL

Approved by: ALN

Figure No.

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
080190	MW-12D	1 of 3

Project Name:	Morrell's Dry Cleaners	Ground Surface Elev.	273
Location:	608 North 1st Street, Tacoma, WA	Top of Casing Elev.	
Driller/Method:	Boart Longyear / Spider Sonic	Depth to Water (ft BGS)	- 10/29/2010
Sampling Method:	Continuous Core	Start/Finish Date	10/25/2010 - 10/27/2010

Depth / Elevation (feet)		Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
1	272	Flushmount monument, thermos cap						Air Vacuum - No Recovery	1
2	271								2
3	270								3
4	269	Concrete seal, 0'-5.5'						Dry, gray-blue, slighlty gravelly, sandy SILT (ML); fine gravel; fine to medium sand	4
5	268							Dark brown, gravelly, very sandy SILT (ML); fine to coarse gravel (2")	5
6	267	Hydrated bentonite chips, 5.5'-110'						Gray-blue/dark brown, slightly gravelly, sandy SILT (ML)	6
7	266								7
8	265							Dry, brown, slightly silty, gravelly, SAND (SP-SM); fine to coarse gravel (2.5"), rounded to subrounded	8
9	264								9
10	263	2" diameter, Sch 40 PVC, 0.4'-113'						Dry, dark brown, gravelly, silty SAND (SM); fine to coarse gravel (2"), rounded to subrounded; fine to coarse sand	10
11	262								11
12	261							Dry, dark brown, very sandy GRAVEL (GW); fine to coarse gravel (2"), rounded to subrounded; fine to coarse sand	12
13	260								13
14	259								14
15	258							Dry, brown, slightly silty, gravelly SAND (SP-SM); fine to coarse gravel (2"), rounded to subrounded; fine to medium sand; with dark gray, slightly clayey, slightly gravelly, very sandy SILT (ML) lense (6")	15
16	257								16
17	256								17
18	255							Dry, brown/light gray, silty, very gravelly SAND (SM); fine to coarse gravel (2"); fine to coarse sand	18
19	254							Red-brown/light gray, slightly gravelly, very silty SAND (SM)	19
20	253								20
21	252							Light gray with red-brown mottling, slightly gravelly, silty SAND (SM); fine gravel; predominantly fine to medium sand	21
22	251								22
23	250								23
24	249								24
25	248							Dark brown, gravelly, very silty SAND (SM)	25
26	247								26
27	246								27
28	245								28
29	244								29
30	243							Slightly gravelly, very silty SAND (SM)	30
31	242							Dry, dark brown SAND (SP); trace gravel and silt; fine gravel, rounded, predominantly medium sand	31
32	241								32
33	240							Dry, dark brown, slightly silty SAND (SP-SM); medium sand	33
34	239								34
35	238							Dry, dark brown, slightly gravelly, silty SAND (SM); fine gravel, subrounded; fine to medium sand	35
36	237							Dry, dark brown, slightly gravelly SAND (SP); trace silt; fine gravel, subrounded; fine to medium sand	36
37	236								37
38	235							Dark brown/yellow-red, gravelly SAND (SP); fine to coarse gravel (1"); predominantly medium sand	38
39	234								39
40	233							Red-brown, slightly gravelly SAND (SP); trace silt; fine to medium sand	40
41	232							Fine to coarse gravel (3"); medium sand	41
42	231								42
43	230								43
44	229								44
45	228							Dark brown, gravelly SAND (SP)	45
46	227							Dark brown/yellow-red, slightly gravelly SAND (SP); trace silt; fine gravel; fine to medium sand	46
47	226								47
48	225							Slightly gravelly SAND (SP); medium sand	48
49	224								49

Sampler Type:

No Recovery

Continuous Core

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: JMS

Approved by: ALN

Figure No.

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
080190	MW-12D	2 of 3

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Boart Longyear / Spider Sonic
Sampling Method: Continuous Core

Ground Surface Elev. 273
Top of Casing Elev.
Depth to Water (ft BGS) - 10/29/2010
Start/Finish Date 10/25/2010 - 10/27/2010

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51 - 222							Medium to coarse sand Slightly gravelly SAND (SP); fine to coarse gravel (1.5"); predominantly medium sand	51
52 - 221								52
53 - 220								53
54 - 219								54
55 - 218							Trace silt; fine gravel	55
56 - 217								56
57 - 216								57
58 - 215							Dry, dark brown, silty SAND (SM); trace fine gravel; fine to medium sand	58
59 - 214								59
60 - 213							Dry, dark brown SAND (SP); medium sand	60
61 - 212								61
62 - 211								62
63 - 210								63
64 - 209								64
65 - 208								65
66 - 207								66
67 - 206							Gravelly SAND (SP); trace silt; fine to coarse gravel (3"), subrounded; medium to coarse sand	67
68 - 205								68
69 - 204								69
70 - 203							Slightly moist, dark brown, slightly silty, very sandy GRAVEL (GW-GM); fine to coarse gravel (2"); fine to coarse sand	70
71 - 202								71
72 - 201								72
73 - 200							Wet, dark brown/dark gray, slightly silty, very gravelly SAND (SP-SM); fine to coarse gravel (2"); medium to coarse sand	73
74 - 199								74
75 - 198							Wet, red-brown, silty, very sandy GRAVEL (GM); fine to coarse gravel (2"); fine to coarse sand	75
76 - 197								76
77 - 196							Wet, yellow-red, silty, gravelly SAND (SM); fine to coarse gravel (2"); fine to coarse sand	77
78 - 195	▽							78
79 - 194							Moist/very moist, dark brown, slightly silty, very gravelly SAND (SP-SM); fine to coarse gravel (1.5"); fine to coarse sand	79
80 - 193								80
81 - 192							Moist/very moist, yellow-red, silty, very gravelly SAND (SM); fine to coarse gravel (2"); fine to coarse sand	81
82 - 191								82
83 - 190							Moist/very moist, yellow-red, silty, very sandy GRAVEL (GM); fine to coarse gravel (3.5"); fine to coarse sand	83
84 - 189							Wet, red-brown/dark brown, slightly gravelly SAND (SP); fine gravel; predominantly medium sand	84
85 - 188								85
86 - 187							Wet, dark brown, slightly silty, gravelly SAND (SP-SM); fine to coarse gravel (2"); predominantly medium sand	86
87 - 186								87
88 - 185							Wet, brown, silty, very sandy GRAVEL (GM); fine to coarse gravel (2"); fine to coarse sand; with slightly silty, SAND (SP-SM) lense (6")	88
89 - 184								89
90 - 183							Wet, dark brown, silty, very gravelly SAND (SM); fine to coarse gravel (1"); predominantly coarse sand	90
91 - 182								91
92 - 181							Dry, gray SILT (ML) Red-brown slightly gravelly, slightly sandy SILT (ML); fine gravel; fine to medium sand	92
93 - 180								93
94 - 179							Dry, brown, gravelly, very silty SAND (SM); fine gravel; fine to coarse sand	94
95 - 178								95
96 - 177							Dry, dark brown, gravelly, very sandy SILT (ML); fine to coarse gravel; fine to coarse sand	96
97 - 176								97
98 - 175							Yellow-red, slightly silty, very gravelly SAND (SP-SM); fine to coarse gravel (2.5"); fine to coarse sand	98
99 - 174							Slightly moist, dark brown, sandy, silty GRAVEL (GM);	99

Sampler Type:
No Recovery
Continuous Core

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: JMS
Approved by: ALN
Figure No.

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
080190	MW-12D	3 of 3

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Boart Longyear / Spider Sonic
Sampling Method: Continuous Core

Ground Surface Elev. 273
Top of Casing Elev.
Depth to Water (ft BGS) - 10/29/2010
Start/Finish Date 10/25/2010 - 10/27/2010

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
101 172							fine to coarse gravel (3"); fine to coarse sand	101
102 171								102
103 170							Slightly moist/moist, dark brown, silty, very gravelly SAND (SM); fine to coarse gravel (1.5"); fine to coarse sand	103
104 169								104
105 168							Moist, dark brown, silty, gravelly SAND (SM); fine to coarse gravel (3"); fine to coarse sand	105
106 167								106
107 166								107
108 165							Moist, dark brown, slightly silty, gravelly SAND (SP-SM); fine to coarse gravel (1.5"); fine to coarse sand	108
109 164								109
110 163	10/20 filter pack, 110'-134.5'						Moist, dark brown SAND (SP); trace fine gravel; medium sand	110
111 162								111
112 161							Slightly moist, dark brown, silty, very sandy GRAVEL (GM); fine to coarse gravel (3"); fine to coarse sand	112
113 160	2" diameter, 10-slot, Sch 40 PVC screen, 113'-133'							113
114 159								114
115 158								115
116 157							Slightly moist, gray, sandy, very silty GRAVEL (GM); fine to coarse gravel (3"); fine to coarse sand	116
117 156								117
118 155								118
119 154								119
120 153							Slightly moist, gray, gravelly, sandy SILT (ML); fine gravel; fine to coarse sand	120
121 152							Dry, dark brown/gray, sandy, silty GRAVEL (GM); fine gravel to cobbles, rounded to subrounded; fine to coarse sand	121
122 151								122
123 150								123
124 149							Moist, yellow-red/gray, slightly silty, sandy GRAVEL (GW-GM), fine to coarse gravel (3"); fine to coarse sand	124
125 148								125
126 147								126
127 146	10/26/2010							127
128 145								128
129 144	10/29/2010						Moist, gray, slightly sandy, gravelly SILT (ML); fine gravel; fine to coarse sand	129
130 143							Dry, dark brown/gray, sandy, gravelly SILT (ML); fine to coarse gravel (2"); fine to coarse sand	130
131 142								131
132 141								132
133 140	PVC endcap							133
134 139							Very moist, gray, slightly sandy, gravelly SILT (ML); fine to coarse gravel (2"); fine to coarse sand	134
135 138	Hydrated bentonite chips, 134.5'-140'						Very moist, brown, silty, sandy GRAVEL (GM); fine to coarse gravel (3"), rounded to subrounded; fine to coarse sand	135
136 137								136
137 136								137
138 135								138
139 134							Wet, brown, silty, sandy GRAVEL (GM); fine to coarse gravel (2"); fine to coarse sand	139
140 133								140
141 132								141
142 131								142
143 130								143
144 129								144
145 128								145
146 127								146
147 126								147
148 125								148
149 124								149

Sampler Type:
No Recovery
Continuous Core

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: JMS
Approved by: ALN
Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-13D	1 of 3

Project Name:	Morrell's Dry Cleaners	Ground Surface Elev.	273
Location:	608 North 1st Street, Tacoma, WA	Top of Casing Elev.	
Driller/Method:	Boart Longyear / Spider Sonic	Depth to Water (ft BGS)	- 10/29/2010
Sampling Method:	Continuous Core	Start/Finish Date	10/27/2010 - 10/29/2010

Depth (feet)	Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
1	272	Flushmount monument, thermos cap						Air Vacuum - No Recovery	1
2	271		○						2
3	270								3
4	269	Concrete seal, 0'-6'						Dry, brown, gravelly SAND (SP); trace silt; fine to coarse gravel (1.5"); predominantly fine sand	4
5	268								5
6	267							Dry, brown, slightly gravelly, silty SAND (SM); fine gravel; fine sand	6
7	266	Hydrated bentonite chips, 6'-121'							7
8	265							Dry, dark brown, slightly silty, very gravelly SAND (SP-SM); fine to coarse gravel (1.5"); fine to coarse sand	8
9	264								9
10	263	2" diameter, Sch 40 PVC, 0.4'-125'						Gray, slightly silty, very gravelly SAND (SP-SM) lense (2")	10
11	262								11
12	261							Dry/slightly moist, gray, gravelly, silty SAND (SM); fine to coarse gravel (1.5"); fine to coarse sand	12
13	260								13
14	259							Dry, yellow-red/gray, sandy, very gravelly SILT (ML); fine to coarse gravel (1.5"); fine to coarse sand	14
15	258								15
16	257							Dry, gray, silty, very gravelly SAND (SM); fine to coarse gravel (1"), rounded to subrounded; fine to coarse sand	16
17	256								17
18	255							Yellow-red/gray mottling, slightly gravelly, silty SAND (SM)	18
19	254								19
20	253							Dry, yellow-red/brown, silty SAND (SM); trace gravel; fine gravel; predominantly fine sand	20
21	252								21
22	251							Gray, silty, very gravelly SAND (SM); fine to coarse gravel (2.5"); fine to coarse sand	22
23	250								23
24	249								24
25	248								25
26	247								26
27	246								27
28	245							Dry, yellow-red, slightly silty, gravelly SAND (SP-SM); fine to coarse gravel (3"); predominantly fine to medium sand	28
29	244		○						29
30	243							Slightly silty, very gravelly SAND (SP-SM); fine to coarse gravel (1.5"); fine to coarse sand	30
31	242								31
32	241							Dry, yellow-red, slightly gravelly SAND (SP); trace silt; fine gravel, rounded; predominantly medium-fine sand	32
33	240								33
34	239								34
35	238								35
36	237							Fine to coarse gravel (1.5"); predominantly medium sand	36
37	236								37
38	235								38
39	234								39
40	233							Slightly moist, dark brown, gravelly SAND (SP); fine to coarse gravel (2"); predominantly medium sand	40
41	232								41
42	231							SAND (SP); medium sand	42
43	230								43
44	229								44
45	228							Silty, gravelly SAND (SM) lense (6")	45
46	227							Yellow-red, slightly gravelly SAND (SP); fine gravel	46
47	226							Dark brown, slightly gravelly SAND (SP); trace silt; fine to coarse gravel (2"); predominantly fine to medium sand	47
48	225								48
49	224								49

Sampler Type:

○ No Recovery

▌ Continuous Core

PID - Photoionization Detector

▼ Static Water Level

▽ Water Level (ATD)

Logged by: JMS

Approved by: ALN

Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-13D	2 of 3

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Boart Longyear / Spider Sonic
Sampling Method: Continuous Core

Ground Surface Elev. 273
Top of Casing Elev.
Depth to Water (ft BGS) - 10/29/2010
Start/Finish Date 10/27/2010 - 10/29/2010

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51 - 222							Trace gravel	51
52 - 221								52
53 - 220								53
54 - 219								54
55 - 218							Fine gravel	55
56 - 217								56
57 - 216								57
58 - 215								58
59 - 214							Slightly moist, gray, silty SAND (SM); fine sand	59
60 - 213							Dry, dark brown/yellow-red SAND (SP); medium-fine sand	60
61 - 212								61
62 - 211								62
63 - 210							Slightly moist, dark brown, silty SAND (SM); fine to medium sand	63
64 - 209								64
65 - 208							Dry, yellow-red/dark brown SAND (SP); medium sand	65
66 - 207							Very gravelly SAND (SP) lense (6")	66
67 - 206								67
68 - 205								68
69 - 204								69
70 - 203							Dark brown silty SAND (SM) lense (6")	70
71 - 202							Slightly moist/moist, dark brown, gravelly SAND (SP); fine to coarse gravel (2"), rounded to subangular; medium-fine sand	71
72 - 201								72
73 - 200							Moist/very moist, dark brown SAND (SP); trace gravel	73
74 - 199							Wet, yellow-red/dark brown, silty, sandy GRAVEL (GM); fine to coarse gravel (2"); fine to coarse sand	74
75 - 198								75
76 - 197								76
77 - 196								77
78 - 195								78
79 - 194							Moist, gray, slightly gravelly, very silty SAND (SM); fine gravel; fine to coarse sand	79
80 - 193								80
81 - 192	▽						Wet, red-brown, silty, gravelly SAND (SM); fine to coarse gravel (1.5"); fine to coarse sand, predominantly coarse	81
82 - 191								82
83 - 190							Wet, red-brown, slightly silty, gravelly SAND (SP-SM); fine to coarse gravel (3"); predominantly medium sand	83
84 - 189								84
85 - 188							Moist, red-brown, sandy, silty GRAVEL (GM); fine to coarse gravel (3"), rounded to subrounded; fine to coarse sand	85
86 - 187								86
87 - 186							Wet, red-brown, slightly silty, gravelly SAND (SP-SM); fine gravel; fine to coarse sand, predominantly coarse	87
88 - 185								88
89 - 184							Moist/very moist, yellow-red/red-brown, slightly silty, very gravelly SAND (SP-SM); fine to coarse gravel (2"), rounded to subangular; fine to coarse sand	89
90 - 183								90
91 - 182							Dry, dark brown, sandy, very gravelly SILT (ML); fine to coarse gravel (2.5"), rounded to subangular; fine to coarse sand	91
92 - 181								92
93 - 180							Wet, dark brown, sandy, very silty GRAVEL (GM); fine to coarse gravel (2"), rounded to subrounded; fine to coarse sand	93
94 - 179								94
95 - 178								95
96 - 177							No recovery	96
97 - 176								97
98 - 175								98
99 - 174								99

Sampler Type:
No Recovery
Continuous Core

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: JMS
Approved by: ALN
Figure No.

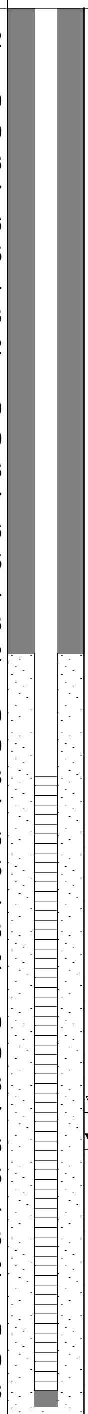
Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
080190	MW-13D	3 of 3

Project Name:	Morrell's Dry Cleaners	Ground Surface Elev.	273
Location:	608 North 1st Street, Tacoma, WA	Top of Casing Elev.	
Driller/Method:	Boart Longyear / Spider Sonic	Depth to Water (ft BGS)	- 10/29/2010
Sampling Method:	Continuous Core	Start/Finish Date	10/27/2010 - 10/29/2010

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
101 / 172							Moist, brown, silty, sandy GRAVEL (GM); fine gravel to cobbles (4"), rounded to angular; fine to coarse sand; with silty, gravelly SAND (SM) lense (6")	101
102 / 171								102
103 / 170							Moist, dark brown/gray, silty, gravelly SAND (SM); fine to coarse gravel (3"), rounded to subrounded; fine to coarse sand	103
104 / 169								104
105 / 168								105
106 / 167							Moist, brown/dark brown, sandy, silty GRAVEL (GM); fine to coarse gravel, rounded to subrounded; fine to coarse sand	106
107 / 166								107
108 / 165							Very moist, dark brown/yellow-red, silty, gravelly SAND (SM); fine to coarse gravel (1"); predominantly coarse sand	108
109 / 164								109
110 / 163							Very moist, brown/dark brown, sandy, very silty GRAVEL (GM); fine to coarse gravel (2.5"); fine to coarse sand	110
111 / 162								111
112 / 161								112
113 / 160							Slightly moist, red-brown/brown, slightly silty, gravelly SAND (SP-SM); fine to coarse gravel (2"); predominanlty fine sand	113
114 / 159								114
115 / 158								115
116 / 157							Dry, light brown, sandy, silty GRAVEL (GM); fine gravel to cobbles (3.5"), rounded to subrounded; fine to coarse sand	116
117 / 156								117
118 / 155							Moist, brown, silty, gravelly SAND (SM) lense (6")	118
119 / 154							Wet, dark brown, slightly silty, gravelly SAND (SP-SM) lense	119
120 / 153							Very moist, brown, sandy, very silty GRAVEL (GM); fine gravel to cobbles (4"); fine to coarse sand	120
121 / 152								121
122 / 151	10/20 filter pack, 121'-146'						Wet, yellow-red, slightly silty, very gravelly SAND (SP-SM); fine to coarse gravel (3"); predominantly medium sand	122
123 / 150								123
124 / 149							Moist, brown, silty, very sandy GRAVEL (GM); fine to coarse gravel (2"); predominantly medium sand	124
125 / 148	2" diameter, 10-slot, Sch 40 PVC screen, 125'-145'						Slightly moist, brown, sandy, silty GRAVEL (GM); fine to coarse gravel (2.5"); fine to coarse sand	125
126 / 147							Very moist/wet, brown, silty, sandy GRAVEL (GM); fine gravel to cobbles (4"); predominantly coarse sand	126
127 / 146							Moist, gray, sandy, very silty GRAVEL (GM); fine to coarse gravel (2"); fine to coarse sand	127
128 / 145							Dry, dark brown/gray, silty, sandy GRAVEL (GM); fine to coarse gravel (3"), rounded to subangular; fine to coarse sand	128
129 / 144								129
130 / 143								130
131 / 142								131
132 / 141								132
133 / 140								133
134 / 139								134
135 / 138							Wet, brown, slightly silty, very gravelly SAND (SP-SM); fine to coarse gravel (2"); predominantly medium to coarse sand	135
136 / 137	10/28/2010							136
137 / 136	10/29/2010							137
138 / 135							Moist, yellow-red, silty, very gravelly SAND (SM); fine to coarse gravel (3"); predominantly medium to coarse sand	138
139 / 134								139
140 / 133							Dry, gray-purple, slightly gravelly, sandy SILT (ML); fine gravel; fine to coarse sand	140
141 / 132								141
142 / 131							Wet, brown, slightly silty, very gravelly SAND (SP-SM); fine to coarse gravel (3"), predominantly coarse sand	142
143 / 130							Wet, brown, slightly silty, sandy GRAVEL (GW-GM); fine to coarse gravel (3"), rounded to angular; fine to coarse sand	143
144 / 129								144
145 / 128	PVC endcap							145
146 / 127								146
147 / 126								147
148 / 125								148
149 / 124								149



Sampler Type:

No Recovery

Continuous Core

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: JMS

Approved by: ALN

Figure No.

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
080190	MW-14D	1 of 3

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Major Drilling - Jeffrey / Sonic Geoprobe 8140LS - track mounted
Sampling Method: Continuous Core

Ground Surface Elev.
Top of Casing Elev. 272.46
Depth to Water (ft BGS) - 2/3/2012
Start/Finish Date 1/30/2012 - 2/2/2012

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
0–8	Flush mounted steel well monument; thermos cap Cement surface seal from 0-2' bgs	No Recovery					Cleared for utilities using an air vacuum - No Recovery.	0–8
8–13	2" ID schedule 40 PVC casing, threaded connection, 0'-123'	Continuous Core					Moist, brown, very gravelly, very silty SAND (SM); cobbles up to 5"; fine to medium sand, diamict fabric.	8–13
13–23	Bentonite chip seal (NSF/ANSI 60), 2'-121' bgs						Slightly moist, sandy, very gravelly, SILT (ML); fine to medium sand; cobbles up to 4". Diamict fabric.	13–23
23–28							Moist, brown, gravelly, very silty SAND (SM); fine to medium sand; subangular gravel; diamict fabric; cobbles up to 4". Orange-brown. Brown.	23–28
28–31							Moist, brown, slightly silty, gravelly SAND (SP-SM); fine to medium sand; subrounded gravel.	28–31
31–33							Moist, gray, gravelly, silty SAND (SM); fine to medium sand; subangular gravel. Brown.	31–33
33–42							Moist, brown, slightly gravelly SAND (SP); fine to medium sand. 1" pockets of pink, slightly silty SAND.	33–42
42–44							Moist, gray with iron stain mottling, gravelly, very sandy SILT (ML); fine to medium sand; subrounded gravel; diamict fabric.	42–44
44–46							Moist, gray, slightly silty, gravelly SAND (SP-SM); fine to medium sand.	44–46
46–48							Moist, orange-brown, slightly gravelly SAND (SP); trace silt.	46–48
48–50							Moist, brown with iron stain mottling, slightly gravelly, silty SAND (SM); 1" pockets of silt, fine to medium sand, subangular fine gravel with cobbles.	48–50

Sampler Type:
No Recovery
Continuous Core

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-14D	2 of 3

Project Name:	Morrell's Dry Cleaners	Ground Surface Elev.	
Location:	608 North 1st Street, Tacoma, WA	Top of Casing Elev.	272.46
Driller/Method:	Major Drilling - Jeffrey / Sonic Geoprobe 8140LS - track mounted	Depth to Water (ft BGS)	- 2/3/2012
Sampling Method:	Continuous Core	Start/Finish Date	1/30/2012 - 2/2/2012

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
							Moist, dark gray brown, slightly gravelly SAND (SP); medium to coarse sand, fine subrounded gravel.	
51							Moist, red-brown, slightly silty SAND (SP-SM); medium sand; trace gravel.	51
53							Gravelly.	53
54							Moist, yellow-brown SAND (SP); medium to coarse sand.	54
59							Moist, gray, slightly silty SAND (SP-SM); fine to medium sand, trace fine gravel; faint stratification	59
60							Moist, brown to dark brown SAND (SP); medium sand.	60
62							Red-orange, slightly gravelly.	62
65							Very moist to wet, brown, very silty SAND (SM); fine sand.	65
66							Grades to fine to medium sand.	66
67							Wet, dark red-brown, very gravelly SAND (SP); coarse sand; trace silt, with cobbles up to 3".	67
71							Wet, brown-gray SAND (SP); trace gravel; medium sand.	71
73							Wet, red-brown GRAVEL (GW); fine to coarse gravel; trace silt; trace coarse sand.	73
74							Moist, red-brown with iron staining, very gravelly SAND (SP); medium sand, fine to coarse rounded gravel with cobbles up to 3"; trace silt; diamict fabric.	74
77							Brown.	77
78							Dry, gray, gravelly, very sandy SILT (ML); fine to medium sand; subrounded to subangular gravel; cobbles up to 4".	78
80							Moist, brown-red, slightly gravelly SAND (SP); medium sand; subrounded gravel; trace silt.	80
81							Slightly moist, gray, gravelly, silty SAND (SM); fine to medium sand; fine to coarse subrounded to rounded gravel.	81
85							Wet, brown SAND (SP); fine to medium sand, trace gravel.	85
86							Wet, red-brown GRAVEL (GP); coarse gravel and cobbles.	86
88							Very moist to wet, brown, gravelly, sandy SILT (ML); diamict fabric, cobbles up to 4".	88
90							Gray.	90
92							Moist, gray-brown, slightly gravelly, silty SAND (SM); fine to medium sand.	92
97							Moist to wet, brown-gray SAND (SP); fine to medium sand.	97
99							Moist, gray-brown, slightly silty, gravelly SAND	99

Sampler Type:

No Recovery

Continuous Core

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: AET

Approved by: ALN

Figure No.

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
080190	MW-14D	3 of 3

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Major Drilling - Jeffrey / Sonic Geoprobe 8140LS - track mounted
Sampling Method: Continuous Core

Ground Surface Elev.:
Top of Casing Elev.: 272.46
Depth to Water (ft BGS): - 2/3/2012
Start/Finish Date: 1/30/2012 - 2/2/2012

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
100–101							(SP-SM).	101
101–104							Moist to wet, brown, very sandy GRAVEL (GP); tr. silt, fine to coarse sand; fine subrounded to subangular gravel.	102–103
104–111							Slightly moist, gray and brown mottled, gravelly, sandy SILT (ML); fine to medium sand; fine to coarse gravel; diamict fabric.	104–110
111–114							Moist, brown and gray mottled, gravelly, silty SAND (SM); fine to medium sand; subrounded gravel up to 2".	111–113
114–116.5							Dry to slightly moist, gray with iron stain mottling, gravelly, sandy SILT (ML); diamict fabric.	114–116
116.5–118							Moist, brown-gray, slightly silty, very gravelly SAND (SP-SM); medium to coarse sand.	117
118–121							Moist, brown-gray, gravelly, silty SAND (SM); cobbles up to 3".	118–120
121–122.5	10x20 colorado silica sand filter pack, 121'-143.5' bgs						Slightly moist, gray, gravelly, sandy SILT (ML); fine to medium sand; cobbles up to 3".	121–122
122.5–125							Moist, brown, very silty, sandy GRAVEL (GM); cobbles up to 4", angular gravel, fine to coarse sand.	123–124
125–128							Dry to slightly moist, gray, gravelly, sandy SILT (ML); fine to medium sand, cobbles up to 4".	125–127
128–133.5	▽ 2/1/2012 (130)						Moist, brown-gray with orange mottling, silty, very gravelly SAND (SM); fine to coarse sand; fine to coarse angular gravel with cobbles up to 3".	128–133
133.5–145	▼ 2/3/2012 (134); 2" ID schedule 40 PVC 20-slot screen, 123.5'-143.5' bgs; Threaded PVC end cap						Moist to wet, gray-brown, gravelly, sandy SILT (ML); fine to coarse sand, fine to coarse subangular gravel; diamict fabric.	134–135
136							Very gravelly.	136
138							Moist.	138
139.5							Wet.	139
145							Bottom of boring at 145' BGS.	145–149

Sampler Type:
No Recovery
Continuous Core

PID - Photoionization Detector
▼ Static Water Level
▽ Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-15	1 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 273.84 ft
Depth to Water
Start/Finish Date 10/14/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
0-1	Flushmount monument, lockable thermos cap, concrete seal 0'-4'						Concrete.	1
1-5							No logging or sampling.	2
5-6							Boring drilled 37 degrees from vertical to intercept saturated soil under alley.	6
10	2" diameter, schedule 40 PVC, threaded connections, 0'-55'							10
20	Hydrated bentonite chips, 4'-52'							20
24-25							Strong solvent-like odor in cuttings. (24 ft bgs)	25
30				36.7				30
49								49

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
080190	MW-15	2 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 273.84 ft
Depth to Water
Start/Finish Date 10/14/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51								51
52								52
53	10/20 sand filter pack, 52'-75'							53
54								54
55	2" diameter, 0.020-inch, schedule 40 PVC screen, 55'-75'							55
56								56
57								57
58								58
59							Well screen is completed in advance outwash beneath alley, 33 to 45 ft west-northwest of monument, and 44 to 60 ft below ground surface	59
60								60
61								61
62								62
63								63
64								64
65								65
66								66
67								67
68								68
69								69
70								70
71								71
72								72
73								73
74								74
75	Threaded PVC endcap							75
76							Bottom of boring is 60 feet below ground surface.	76
77								77
78								78
79								79
80								80
81								81
82								82
83								83
84								84
85								85
86								86
87								87
88								88
89								89
90								90
91								91
92								92
93								93
94								94
95								95
96								96
97								97
98								98
99								99

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

_MONITORING WELL STADIUM THRIFTWAY.GPJ February 7, 2014

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-16	1 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 272.88 ft
Depth to Water
Start/Finish Date 10/15/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
0–4	Flushmount monument, lockable thermos cap, concrete seal 0'-4'						Asphalt over concrete. No logging or sampling.	
5–6							Boring drilled 23 degrees from vertical, perpendicular to the building.	
10–11	2" diameter, schedule 40 PVC, threaded connections, 0'-45'							
20–21	Hydrated bentonite chips, 4'-42'							
42–45	10/20 sand filter pack, 42'-65'						Well screen is completed in advance outwash beneath Morrell's Dry Cleaners building, 18 to 25 feet west-northwest of monument, and 41 to 60 feet below ground surface	

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

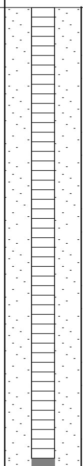
Logged by: AET
Approved by: ALN
Figure No.

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-16	2 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 272.88 ft
Depth to Water
Start/Finish Date 10/15/2013



Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51								51
52								52
53								53
54								54
55	2" diameter,							55
56	0.020-inch, schedule							56
57	40 PVC screen, 45'-65'							57
58								58
59								59
60								60
61								61
62								62
63								63
64								64
65	Threaded PVC endcap						Bottom of boring is 60 feet below ground surface.	65
66								66
67								67
68								68
69								69
70								70
71								71
72								72
73								73
74								74
75								75
76								76
77								77
78								78
79								79
80								80
81								81
82								82
83								83
84								84
85								85
86								86
87								87
88								88
89								89
90								90
91								91
92								92
93								93
94								94
95								95
96								96
97								97
98								98
99								99

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-17	1 of 2

Aspect CONSULTING

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 272.97 ft
Depth to Water
Start/Finish Date 10/15/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
0–4	Flushmount monument, lockable thermos cap, concrete seal 0'-4'						Asphalt over concrete. No logging or sampling.	1–4
5–6							Boring drilled 32 degrees from vertical, perpendicular to the building.	5–6
10–12	2" diameter, schedule 40 PVC, threaded connections, 0'-51'							10–12
20–21	Hydrated bentonite chips, 4'-48'							20–21
43–45							Well screen is completed in advance outwash beneath Morrell's Dry Cleaners, 27 to 38 feet west-northwest of monument, and 43 to 60 feet below ground surface.	43–45
48–49	10/20 sand filter pack, 48'-71'							48–49

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-17	2 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 272.97 ft
Depth to Water
Start/Finish Date 10/15/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51								51
52								52
53								53
54								54
55	2" diameter,							55
56	0.020-inch, schedule							56
57	40 PVC screen, 51'-71'							57
58								58
59								59
60								60
61								61
62								62
63								63
64								64
65								65
66								66
67								67
68								68
69								69
70								70
71	Threaded PVC endcap						Bottom of boringis 60 feet below ground surface.	71
72								72
73								73
74								74
75								75
76								76
77								77
78								78
79								79
80								80
81								81
82								82
83								83
84								84
85								85
86								86
87								87
88								88
89								89
90								90
91								91
92								92
93								93
94								94
95								95
96								96
97								97
98								98
99								99

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-18	1 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 272.80 ft
Depth to Water
Start/Finish Date 10/16/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
0-1	Flushmount monument, lockable thermos cap, concrete seal 0'-4'						Asphalt over concrete.	1
1-3							No logging or sampling, strong solvent-like odor in cuttings.	2
5-6							Boring drilled 45 degrees from vertical, perpendicular to the building.	6
10	2" diameter, schedule 40 PVC, threaded connections, 0'-65'							10
20	Hydrated bentonite chips, 4'-62'							20

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

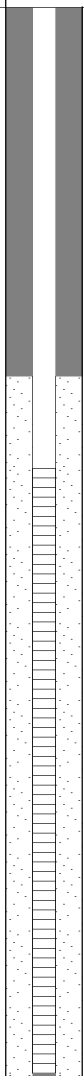
Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-18	2 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 272.80 ft
Depth to Water
Start/Finish Date 10/16/2013



Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51								51
52								52
53								53
54								54
55								55
56								56
57								57
58								58
59								59
60								60
61								61
62								62
63	10/20 sand filter pack, 62'-85'							63
64							Well screen is completed in advance outwash beneath Morrell's Dry Cleaners, 46 to 60 feet west-northwest of monument, and 46 to 60 feet below ground surface	64
65								65
66								66
67								67
68								68
69								69
70								70
71								71
72								72
73								73
74								74
75	2" diameter, 0.020-inch schedule 40 PVC screen, 65'-85'							75
76								76
77								77
78								78
79								79
80								80
81								81
82								82
83								83
84								84
85	Threaded PVC endcap						Bottom of boring is 60 feet below ground surface.	85
86								86
87								87
88								88
89								89
90								90
91								91
92								92
93								93
94								94
95								95
96								96
97								97
98								98
99								99

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-19	1 of 2

Project Name:	Morrell's Dry Cleaners	Ground Surface Elev. (site datum)	
Location:	608 North 1st Street, Tacoma, WA	Top of Casing Elev. (site datum)	273.15 ft
Driller/Method:	Cascade Drilling / Hollow Stem Auger - Angle	Depth to Water	
Sampling Method:	Dames & Moore	Start/Finish Date	10/17/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
0	Flushmount monument, lockable thermos cap, concrete seal 0'-2'						Asphalt.	0
1							Very dense, moist, brown, slightly silty, gravelly SAND (SP-SM); diamict fabric, fine to medium sand, solvent-like odor.	1
10	2" diameter, schedule 40 PVC, threaded connections, 0'-45'	■			50/6			10
20	Hydrated bentonite chips, 2'-42'	■			50/6		Very dense, moist, brown gray, silty, gravelly SAND (SM); diamict fabric, solvent-like odor, predominantly fine sand, fine to coarse gravel.	20
25		■			50/6		Trace gravel.	25
30		■			50/6		Very dense, moist, orange brown, slightly gravelly SAND (SP); fine to medium sand, solvent-like odor.	30
35		■			21 21 30		Trace silt.	35
40		■			36 50/6		Trace fine gravel, slight solvent-like odor.	40
43	10/20 sand filter pack, 42'-60.5'							43
45		■			50/6			45
49								49

Sampler Type:

- No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector

- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: AET

Approved by: ALN

Figure No.

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
080190	MW-19	2 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: Dames & Moore

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 273.15 ft
Depth to Water
Start/Finish Date 10/17/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
50					50/6		Wet, red brown.	50
55	2" diameter, 0.020-inch, schedule 40 PVC screen, 45'-60'							55
60	Threaded PVC endcap				50/6		Very dense, wet, dark red brown SAND (SW); fine to coarse sand, trace fine gravel.	60
61							Bottom of boring is 60.5 feet below ground surface.	61

Depth scale: 51–99 feet.

Sampler Type:
- No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

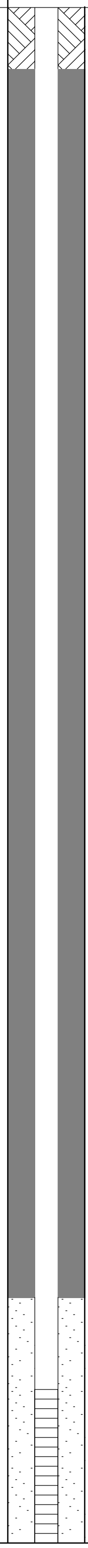
![Aspect Consulting]

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-20	1 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 273.03 ft
Depth to Water
Start/Finish Date 10/11/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
1–49	 Flushmount monument, lockable thermos cap, concrete seal 0'-2'; 2" diameter, schedule 40 PVC, threaded connections, 0'-45'; Hydrated bentonite chips, 2'-42'; 10/20 sand filter pack, 42'-60'						Asphalt. No logging or sampling.	1–49

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
080190	MW-20	2 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 273.03 ft
Depth to Water
Start/Finish Date 10/11/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51								51
52								52
53								53
54								54
55	2" diameter, 0.020-inch, schedule 40 PVC screen, 45'-60'							55
56								56
57								57
58								58
59								59
60	Threaded PVC endcap						Bottom of boring is 60 feet below ground surface.	60
61								61
62								62
63								63
64								64
65								65
66								66
67								67
68								68
69								69
70								70
71								71
72								72
73								73
74								74
75								75
76								76
77								77
78								78
79								79
80								80
81								81
82								82
83								83
84								84
85								85
86								86
87								87
88								88
89								89
90								90
91								91
92								92
93								93
94								94
95								95
96								96
97								97
98								98
99								99

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
080190	MW-21	1 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: Dames & Moore

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 274.03 ft
Depth to Water
Start/Finish Date 10/17/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Description	Depth (ft)
0–2	Flushmount monument, lockable thermos cap, concrete seal 0'-2'					Asphalt. Very dense, moist, brown, silty, gravelly SAND (SM); diamict fabric, fine to medium sand.	1–2
5		Split-spoon		0.0	50/6		5
10	2" diameter, schedule 40 PVC, threaded connections, 0'-45'	Split-spoon	VOC/FOC	10.5	26 50/6		10
15		Split-spoon	VOC/FOC	165	50/6		15
20	Hydrated bentonite chips, 2'-42'	Split-spoon		0.0	50/6		20
25		Split-spoon	VOC/FOC	0.0	50/6		25
30		Split-spoon		0.0	50/6		30
35		Split-spoon		0.0	50/5	Very dense, moist, red brown, slightly gravelly SAND (SP); fine to medium sand.	35
40		Split-spoon	VOC/FOC	0.0	50/6	Brown.	40
42–43	10/20 sand filter pack, 42'-60.5'						43
45		Split-spoon		0.0	50/6	Red brown, trace fine gravel.	45

Sampler Type:
- No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	MW-21	2 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: Dames & Moore

Ground Surface Elev. (site datum)
Top of Casing Elev. (site datum) 274.03 ft
Depth to Water
Start/Finish Date 10/17/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51				0.0	50/6		Very dense, moist, brown, slightly silty SAND (SP-SM); fine sand.	51
52								52
53								53
54								54
55	2" diameter, 0.020-inch, schedule 40 PVC screen, 45'-60'		VOC/FOC	0.0	50/6		Very dense, wet, brown, SAND (SP); fine to medium sand.	55
56								56
57								57
58								58
59								59
60	Threaded PVC endcap			0.0	50/6			60
61							Bottom of boring is 60.5 feet below ground surface.	61
62								62
63								63
64								64
65								65
66								66
67								67
68								68
69								69
70								70
71								71
72								72
73								73
74								74
75								75
76								76
77								77
78								78
79								79
80								80
81								81
82								82
83								83
84								84
85								85
86								86
87								87
88								88
89								89
90								90
91								91
92								92
93								93
94								94
95								95
96								96
97								97
98								98
99								99

Sampler Type:
No Recovery
3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	VE-1	1 of 1

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum) 273.99 ft
Top of Casing Elev. (site datum)
Depth to Water
Start/Finish Date 10/21/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
1	Sand well-head protection with concrete overtop.						Concrete.	1
2							No logging or sampling, strong solvent-like odor in cuttings.	2
5	4" diameter, schedule 40 PVC, threaded connections, 0'-25'						Boring drilled 45 degrees from vertical, perpendicular to the building.	5
10	Hydrated bentonite chips, 2'-22'							10
23	10/20 sand filter pack, 22'-45'							23
25							Well screen is completed in glacial till beneath Morrell's Dry Cleaners building, 18 to 32 feet west-northwest of near-surface manifold, and 18 to 32 feet below ground surface	25
35	4" diameter, 0.020-inch, schedule 40 PVC screen, 25'-45'							35
45	Threaded PVC endcap						Bottom of boring is 32 feet below ground surface.	45

Depth scale: 1–49 feet.

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

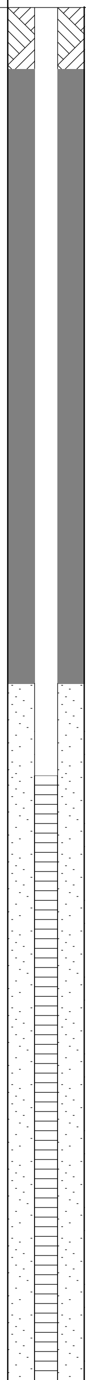
Logged by: AET
Approved by: ALN
Figure No.

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
080190	VE-2	1 of 1

Project Name:	Morrell's Dry Cleaners	Ground Surface Elev. (site datum)	273.81 ft
Location:	608 North 1st Street, Tacoma, WA	Top of Casing Elev. (site datum)	
Driller/Method:	Cascade Drilling / Hollow Stem Auger - Angle	Depth to Water	
Sampling Method:	No samples	Start/Finish Date	10/21/2013



Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
1	Sand well-head protection with concrete overtop.						Concrete.	1
2							No logging or sampling, strong solvent-like odor in cuttings.	2
3								3
4								4
5	4" diameter, schedule 40 PVC, threaded connections, 0'-25'							5
6							Boring drilled 45 degrees from vertical, perpendicular to the building.	6
7								7
8								8
9								9
10	Hydrated bentonite chips, 2'-22'							10
11								11
12								12
13								13
14								14
15								15
16								16
17								17
18								18
19								19
20								20
21								21
22								22
23	10/20 sand filter pack, 22'-45'							23
24								24
25							Well screen is completed in glacial till beneath Morrell's Dry Cleaners building, 18 to 32 feet west-northwest of near-surface manifold, and 18 to 32 feet below ground surface.	25
26								26
27								27
28								28
29								29
30								30
31								31
32								32
33								33
34								34
35	4" diameter, 0.020-inch, schedule 40 PVC screen, 25'-45'							35
36								36
37								37
38								38
39								39
40								40
41								41
42								42
43								43
44								44
45	Threaded PVC endcap						Bottom of boring is 32 feet below ground surface.	45
46								46
47								47
48								48
49								49

Sampler Type:

No Recovery

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: AET

Approved by: ALN

Figure No.

Monitoring Well Construction Log

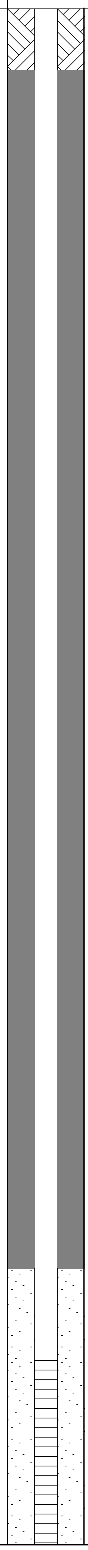
Aspect CONSULTING

Project Number	Well Number	Sheet
080190	VE-3	1 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum) 273.92 ft
Top of Casing Elev. (site datum)
Depth to Water
Start/Finish Date 10/22/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
0–2	Sand well-head protection with concrete overtop.						Concrete.	0–2
1–3							No logging or sampling, strong solvent-like odor in cuttings.	1–3
5–7	4" diameter, schedule 40 PVC, threaded connections, 0'-44'						Boring drilled 45 degrees from vertical, perpendicular to the building.	5–7
10–11	Hydrated bentonite chips, 2'-41'							10–11
42–45	10/20 sand filter pack, 41'-64'						Well screen is completed in advance outwash beneath Morrell's Dry Cleaners building, 31 to 45 feet west-northwest of near-surface manifold, and 31 to 45 feet below ground surface.	42–45



Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Project Name: Morrell's Dry Cleaners

Location: 608 North 1st Street, Tacoma, WA

Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle

Sampling Method: No samples

Ground Surface Elev. (site datum) 273.92 ft

Top of Casing Elev. (site datum)

Depth to Water

Start/Finish Date 10/22/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51	4" diameter, 0.020-inch, schedule 40 PVC screen, 44'-64'							51
64	Threaded PVC endcap						Bottom of boring is 45 feet below ground surface.	64

Depth scale 51–99 ft.

Sampler Type:

No Recovery

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: AET

Approved by: ALN

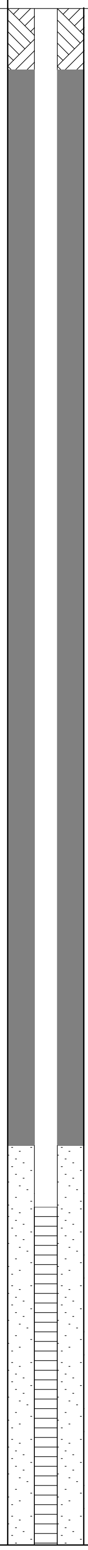
Figure No.

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	VE-4	1 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum) 273.53 ft
Top of Casing Elev. (site datum)
Depth to Water
Start/Finish Date 10/18/2013



Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
1	Sand well-head protection with concrete overtop.						Concrete. No logging or sampling, strong solvent-like odor in cuttings.	1
2								2
3								3
4								4
5	4" diameter, schedule 40 PVC, threaded connections, 0'-39'						Boring drilled 40 degrees from vertical, perpendicular to the building.	5
6								6
7								7
8								8
9								9
10	Hydrated bentonite chips, 2'-37'							10
11								11
12								12
13								13
14								14
15								15
16								16
17								17
18								18
19								19
20								20
21								21
22								22
23								23
24								24
25								25
26								26
27								27
28								28
29								29
30								30
31								31
32								32
33								33
34								34
35								35
36								36
37							Well screen is completed in advance outwash beneath Morrell's Dry Cleaners building, 25 to 38 feet west-northwest of near-surface manifold, and 30 to 45 feet below ground surface.	37
38	10/20 sand filter pack, 37'-59'							38
39								39
40								40
41								41
42								42
43								43
44								44
45								45
46								46
47								47
48								48
49								49

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

Aspect CONSULTING

Monitoring Well Construction Log

Project Number	Well Number	Sheet
080190	VE-4	2 of 2

Project Name: Morrell's Dry Cleaners
Location: 608 North 1st Street, Tacoma, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger - Angle
Sampling Method: No samples

Ground Surface Elev. (site datum) 273.53 ft
Top of Casing Elev. (site datum)
Depth to Water
Start/Finish Date 10/18/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
51	4" diameter, 0.020-inch, schedule 40 PVC screen, 39'-59'							51
52								52
53								53
54								54
55								55
56								56
57								57
58								58
59	Threaded PVC endcap						Bottom of boring is 45 feet below ground surface.	59
60								60
61								61
62								62
63								63
64								64
65								65
66								66
67								67
68								68
69								69
70								70
71								71
72								72
73								73
74								74
75								75
76								76
77								77
78								78
79								79
80								80
81								81
82								82
83								83
84								84
85								85
86								86
87								87
88								88
89								89
90								90
91								91
92								92
93								93
94								94
95								95
96								96
97								97
98								98
99								99

Sampler Type:
No Recovery

PID - Photoionization Detector
Static Water Level
Water Level (ATD)

Logged by: AET
Approved by: ALN
Figure No.

APPENDIX B

Underground Storage Tank Decommissioning Report

Tacoma Fire Department
Fire Prevention Bureau 253.591.5740
FAX Number 253.594.7943
3471 S. 35th St. Tacoma, WA 98409
www.tacomafiredepartment.org

Tacoma Fire Department
Heating Oil Tank
Decommissioning Report

Address tank located: 608 N 1ST ST, TACOMA WA 98403

Property owner: ______________________

Date of decommissioning: 12-12-13 Tank size: 800 GAL

Type of disposal: In Place X Removal ______

Type of fill material: CDF

Company name: CLEARCREEK CONTRACTORS Phone 425-252-8800

Person responsible for disposal: ______________________

City of Tacoma business license number: 500015953

ICC UST Certification number: 8209012

Dept. of Ecology Certification number: ______________________

If required: Soil analysis company: ______________________

Results of analysis: ______________________

I, the property owner, was provided with a copy of the permit conditions and the Tacoma Fire Department Information bulletin. I understand that no permit will be issued after decommissioning is already done. I also understand that the ICC-certified Decommissioner will provide me with a copy of the Decommissioning report within 30 days of completion of the work.

Signature of property owner: [signature] Date 12/18/13

Signature of Decommissioner: [signature] Date 12-12-13

APPENDIX C

Soil Analytical Results

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
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October 29, 2013

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on October 11, 2013 from the Stadium Thriftway 080190, F&BI 310224 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: data@aspectconsulting.com, Parker Wittman, Eric Geissenger
ASP1029R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on October 11, 2013 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Stadium Thriftway 080190, F&BI 310224 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
310224 -01	MW-21-25
310224 -02	MW-21-40
310224 -03	MW-21-55
310224 -04	MW-21-11
310224 -05	MW-21-15.5

The samples were sent to Amtest for FOC analysis. The report generated by Amtest will be forwarded to your office upon receipt.

Chloroform was detected in several of the 8260C samples. The data were flagged as likely due to laboratory contamination.

The 8260C matrix spike and matrix spike duplicate failed the relative percent difference for several compounds. The analytes were not detected therefore the data were acceptable.

Several compounds in the 8260C matrix spike and matrix spike duplicate exceeded the acceptance criteria. The analytes were not detected in the sample, therefore the data were acceptable.

The 8260C calibration standard failed the acceptance criteria for hexachlorobutadiene. The data were flagged accordingly.

All other quality control requirements were acceptable.

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-21-25	Client:	Aspect Consulting, LLC
Date Received:	10/11/13	Project:	Stadium Thriftway 080190, F&BI 310224
Date Extracted:	10/14/13	Lab ID:	310224-01
Date Analyzed:	10/14/13	Data File:	101424.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	50	150
Toluene-d8	103	50	150
4-Bromofluorobenzene	100	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	0.14 lc	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25 ca
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-21-40	Client:	Aspect Consulting, LLC
Date Received:	10/11/13	Project:	Stadium Thriftway 080190, F&BI 310224
Date Extracted:	10/14/13	Lab ID:	310224-02
Date Analyzed:	10/14/13	Data File:	101425.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	50	150
Toluene-d8	103	50	150
4-Bromofluorobenzene	100	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	0.10 lc	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25 ca
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-21-55	Client:	Aspect Consulting, LLC
Date Received:	10/11/13	Project:	Stadium Thriftway 080190, F&BI 310224
Date Extracted:	10/14/13	Lab ID:	310224-03
Date Analyzed:	10/14/13	Data File:	101426.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	50	150
Toluene-d8	103	50	150
4-Bromofluorobenzene	102	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	0.095
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	0.095	Bromobenzene	<0.05
Chloroform	0.15 lc	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	0.032	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25 ca
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-21-11	Client:	Aspect Consulting, LLC
Date Received:	10/11/13	Project:	Stadium Thriftway 080190, F&BI 310224
Date Extracted:	10/16/13	Lab ID:	310224-04
Date Analyzed:	10/16/13	Data File:	101613.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	50	150
Toluene-d8	99	50	150
4-Bromofluorobenzene	102	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	0.63
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-21-15.5	Client:	Aspect Consulting, LLC
Date Received:	10/11/13	Project:	Stadium Thriftway 080190, F&BI 310224
Date Extracted:	10/16/13	Lab ID:	310224-05
Date Analyzed:	10/16/13	Data File:	101614.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	50	150
Toluene-d8	101	50	150
4-Bromofluorobenzene	102	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	44 ve
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	0.051	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	0.57	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-21-15.5	Client:	Aspect Consulting, LLC
Date Received:	10/11/13	Project:	Stadium Thriftway 080190, F&BI 310224
Date Extracted:	10/16/13	Lab ID:	310224-05 1/10
Date Analyzed:	10/17/13	Data File:	101705.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	50	150
Toluene-d8	102	50	150
4-Bromofluorobenzene	102	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<5	1,3-Dichloropropane	<0.5
Chloromethane	<5	Tetrachloroethene	44
Vinyl chloride	<0.5	Dibromochloromethane	<0.5
Bromomethane	<5	1,2-Dibromoethane (EDB)	<0.5
Chloroethane	<5	Chlorobenzene	<0.5
Trichlorofluoromethane	<5	Ethylbenzene	<0.5
Acetone	<5	1,1,1,2-Tetrachloroethane	<0.5
1,1-Dichloroethene	<0.5	m,p-Xylene	<1
Methylene chloride	<5	o-Xylene	<0.5
Methyl t-butyl ether (MTBE)	<0.5	Styrene	<0.5
trans-1,2-Dichloroethene	<0.5	Isopropylbenzene	<0.5
1,1-Dichloroethane	<0.5	Bromoform	<0.5
2,2-Dichloropropane	<0.5	n-Propylbenzene	<0.5
cis-1,2-Dichloroethene	<0.5	Bromobenzene	<0.5
Chloroform	<0.5	1,3,5-Trimethylbenzene	<0.5
2-Butanone (MEK)	<5	1,1,2,2-Tetrachloroethane	<0.5
1,2-Dichloroethane (EDC)	<0.5	1,2,3-Trichloropropane	<0.5
1,1,1-Trichloroethane	<0.5	2-Chlorotoluene	<0.5
1,1-Dichloropropene	<0.5	4-Chlorotoluene	<0.5
Carbon tetrachloride	<0.5	tert-Butylbenzene	<0.5
Benzene	<0.3	1,2,4-Trimethylbenzene	<0.5
Trichloroethene	0.77	sec-Butylbenzene	<0.5
1,2-Dichloropropane	<0.5	p-Isopropyltoluene	<0.5
Bromodichloromethane	<0.5	1,3-Dichlorobenzene	<0.5
Dibromomethane	<0.5	1,4-Dichlorobenzene	<0.5
4-Methyl-2-pentanone	<5	1,2-Dichlorobenzene	<0.5
cis-1,3-Dichloropropene	<0.5	1,2-Dibromo-3-chloropropane	<5
Toluene	<0.5	1,2,4-Trichlorobenzene	<2.5
trans-1,3-Dichloropropene	<0.5	Hexachlorobutadiene	<2.5
1,1,2-Trichloroethane	<0.5	Naphthalene	<0.5
2-Hexanone	<5	1,2,3-Trichlorobenzene	<2.5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Stadium Thriftway 080190, F&BI 310224
Date Extracted:	10/16/13	Lab ID:	03-2055 mb
Date Analyzed:	10/16/13	Data File:	101609.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	50	150
Toluene-d8	99	50	150
4-Bromofluorobenzene	101	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Stadium Thriftway 080190, F&BI 310224
Date Extracted:	10/14/13	Lab ID:	03-2053 mb
Date Analyzed:	10/14/13	Data File:	101409.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	50	150
Toluene-d8	103	50	150
4-Bromofluorobenzene	100	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25 ca
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

Date of Report: 10/29/13
Date Received: 10/11/13
Project: Stadium Thriftway 080190, F&BI 310224

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

Laboratory Code: 310191-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	10	9 vo	10-56	11
Chloromethane	mg/kg (ppm)	2.5	<0.5	34	32	10-90	6
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	32	29	10-91	10
Bromomethane	mg/kg (ppm)	2.5	<0.5	83	66	10-110	23 vo
Chloroethane	mg/kg (ppm)	2.5	<0.5	41	40	10-101	2
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	34	31	10-95	9
Acetone	mg/kg (ppm)	12.5	<0.5	51	51	11-141	0
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	44	41	11-103	7
Methylene chloride	mg/kg (ppm)	2.5	<0.5	59	59	14-128	0
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	62	63	17-134	2
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	49	48	13-112	2
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	54	53	23-115	2
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	58	57	18-117	2
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	54	54	25-120	0
Chloroform	mg/kg (ppm)	2.5	<0.05	57	58	29-117	2
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	55	55	20-133	0
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	60	60	22-124	0
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	54	52	27-112	4
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	53	51	26-107	4
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	55	53	22-115	4
Benzene	mg/kg (ppm)	2.5	0.055	54	53	26-114	2
Trichloroethene	mg/kg (ppm)	2.5	<0.03	55	54	30-112	2
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	61	61	31-119	0
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	63	62	31-131	2
Dibromomethane	mg/kg (ppm)	2.5	<0.05	60	59	27-124	2
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	72	73	16-147	1
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	68	68	28-137	0
Toluene	mg/kg (ppm)	2.5	<0.05	56	54	34-112	4
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	62	61	30-136	2
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	63	64	32-126	2
2-Hexanone	mg/kg (ppm)	12.5	<0.5	60	60	17-147	0
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	61	60	29-125	2
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	55	54	27-110	2
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	61	62	32-143	2
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	62	63	32-126	2
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	57	57	37-113	0
Ethylbenzene	mg/kg (ppm)	2.5	0.19	54	54	38-111	0
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	63	62	35-126	2
m,p-Xylene	mg/kg (ppm)	5	0.087	60	59	38-112	2
o-Xylene	mg/kg (ppm)	2.5	<0.05	61	60	38-113	2
Styrene	mg/kg (ppm)	2.5	<0.05	60	60	38-118	0
Isopropylbenzene	mg/kg (ppm)	2.5	<0.05	58	58	37-114	0
Bromoform	mg/kg (ppm)	2.5	<0.05	64	64	18-155	0
n-Propylbenzene	mg/kg (ppm)	2.5	0.077	57	57	36-114	0
Bromobenzene	mg/kg (ppm)	2.5	<0.05	59	59	40-115	0
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	60	60	35-116	0
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	60	62	33-128	3
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	59	60	33-123	2
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	59	59	39-110	0
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	59	59	39-111	0
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	59	59	36-116	0
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	0.039	66	66	35-116	0
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	60	60	33-118	0
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	58	58	32-119	0
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	56	57	38-111	2
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	54	55	39-109	2
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	57	57	40-111	0
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	60	61	34-134	2
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	58	58	31-117	0
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	53	55	25-122	4
Naphthalene	mg/kg (ppm)	2.5	<0.05	61	62	39-120	2
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	57	58	35-117	2

Date of Report: 10/29/13
Date Received: 10/11/13
Project: Stadium Thriftway 080190, F&BI 310224

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	32	10-76
Chloromethane	mg/kg (ppm)	2.5	57	34-98
Vinyl chloride	mg/kg (ppm)	2.5	60	42-107
Bromomethane	mg/kg (ppm)	2.5	96	46-113
Chloroethane	mg/kg (ppm)	2.5	73	47-115
Trichlorofluoromethane	mg/kg (ppm)	2.5	70	53-112
Acetone	mg/kg (ppm)	12.5	79	39-147
1,1-Dichloroethene	mg/kg (ppm)	2.5	77	65-110
Methylene chloride	mg/kg (ppm)	2.5	91	62-119
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	99	72-122
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	85	71-113
1,1-Dichloroethane	mg/kg (ppm)	2.5	90	76-109
2,2-Dichloropropane	mg/kg (ppm)	2.5	94	64-151
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	89	77-110
Chloroform	mg/kg (ppm)	2.5	94	78-108
2-Butanone (MEK)	mg/kg (ppm)	12.5	89	60-121
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	97	80-109
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	91	72-116
1,1-Dichloropropene	mg/kg (ppm)	2.5	89	77-108
Carbon tetrachloride	mg/kg (ppm)	2.5	93	67-123
Benzene	mg/kg (ppm)	2.5	91	75-107
Trichloroethene	mg/kg (ppm)	2.5	90	72-107
1,2-Dichloropropane	mg/kg (ppm)	2.5	101	78-111
Bromodichloromethane	mg/kg (ppm)	2.5	103	75-126
Dibromomethane	mg/kg (ppm)	2.5	98	80-111
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	119	80-128
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	116	71-138
Toluene	mg/kg (ppm)	2.5	88	79-112
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	104	77-135
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	102	84-115
2-Hexanone	mg/kg (ppm)	12.5	103	71-129
1,3-Dichloropropane	mg/kg (ppm)	2.5	100	82-113
Tetrachloroethene	mg/kg (ppm)	2.5	91	77-110
Dibromochloromethane	mg/kg (ppm)	2.5	101	64-152
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	103	83-116
Chlorobenzene	mg/kg (ppm)	2.5	91	82-113
Ethylbenzene	mg/kg (ppm)	2.5	92	81-114
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	99	76-125
m,p-Xylene	mg/kg (ppm)	5	92	82-115
o-Xylene	mg/kg (ppm)	2.5	94	81-116
Styrene	mg/kg (ppm)	2.5	97	81-118
Isopropylbenzene	mg/kg (ppm)	2.5	91	81-117
Bromoform	mg/kg (ppm)	2.5	108	50-174
n-Propylbenzene	mg/kg (ppm)	2.5	92	82-116
Bromobenzene	mg/kg (ppm)	2.5	95	82-118
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	92	83-120
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	98	83-125
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	95	79-116
2-Chlorotoluene	mg/kg (ppm)	2.5	90	80-114
4-Chlorotoluene	mg/kg (ppm)	2.5	93	82-114
tert-Butylbenzene	mg/kg (ppm)	2.5	93	82-116
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	94	82-116
sec-Butylbenzene	mg/kg (ppm)	2.5	93	81-123
p-Isopropyltoluene	mg/kg (ppm)	2.5	90	82-124
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	89	80-118
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	86	79-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	90	80-118
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	98	71-131
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	90	75-122
Hexachlorobutadiene	mg/kg (ppm)	2.5	83	74-130
Naphthalene	mg/kg (ppm)	2.5	95	83-128
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	90	80-126

Date of Report: 10/29/13
Date Received: 10/11/13
Project: Stadium Thriftway 080190, F&BI 310224

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

Laboratory Code: 310261-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	20	15	10-56	29 vo
Chloromethane	mg/kg (ppm)	2.5	<0.5	46	41	10-90	11
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	45	38	10-91	17
Bromomethane	mg/kg (ppm)	2.5	<0.5	65	73	10-110	12
Chloroethane	mg/kg (ppm)	2.5	<0.5	52	46	10-101	12
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	45	39	10-95	14
Acetone	mg/kg (ppm)	12.5	<0.5	85	82	11-141	4
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	53	46	11-103	14
Methylene chloride	mg/kg (ppm)	2.5	<0.5	70	64	14-128	9
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	73	69	17-134	6
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	57	51	13-112	11
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	64	58	23-115	10
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	63	56	18-117	12
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	63	57	25-120	10
Chloroform	mg/kg (ppm)	2.5	<0.05	66	61	29-117	8
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	76	74	20-133	3
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	68	63	22-124	8
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	59	52	27-112	13
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	54	49	26-107	10
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	55	47	22-115	16
Benzene	mg/kg (ppm)	2.5	0.088	58	52	26-114	11
Trichloroethene	mg/kg (ppm)	2.5	<0.03	55	49	30-112	12
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	68	64	31-119	6
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	70	66	31-131	6
Dibromomethane	mg/kg (ppm)	2.5	<0.05	67	61	27-124	9
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	89	84	16-147	6
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	76	71	28-137	7
Toluene	mg/kg (ppm)	2.5	2.6	58 b	46 b	34-112	23 b
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	74	67	30-136	10
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	102	90	32-126	12
2-Hexanone	mg/kg (ppm)	12.5	<0.5	79	76	17-147	4
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	68	65	29-125	5
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	44	37	27-110	17
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	70	62	32-143	12
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	67	63	32-126	6
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	57	51	37-113	11
Ethylbenzene	mg/kg (ppm)	2.5	3.9	51 b	34 b	38-111	40 b
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	68	59	35-126	14
m,p-Xylene	mg/kg (ppm)	5	15	44 b	20 b	38-112	75 b
o-Xylene	mg/kg (ppm)	2.5	8.2	41 b	18 b	38-113	78 b
Styrene	mg/kg (ppm)	2.5	<0.05	66	59	38-118	11
Isopropylbenzene	mg/kg (ppm)	2.5	1.7	48 b	34 b	37-114	34 b
Bromoform	mg/kg (ppm)	2.5	<0.05	71	64	18-155	10
n-Propylbenzene	mg/kg (ppm)	2.5	5.8	45 b	20 b	36-114	77 b
Bromobenzene	mg/kg (ppm)	2.5	<0.05	57	52	40-115	9
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	9.0	37 b	7 b	35-116	136 b
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	114	96	33-128	17
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	69	64	33-123	8
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	164 vo	145 vo	39-110	12
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	79	70	39-111	12
tert-Butylbenzene	mg/kg (ppm)	2.5	0.045	45	37	36-116	20
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	29	36 b	0 b	35-116	0 b
sec-Butylbenzene	mg/kg (ppm)	2.5	2.6	41 b	24 b	33-118	52 b
p-Isopropyltoluene	mg/kg (ppm)	2.5	2.1	38 b	24 b	32-119	45 b
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	49	41	38-111	18
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	49	42	39-109	15
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	55	48	40-111	14
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	88	64	34-134	32 vo
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	45	37	31-117	20
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	41	29	25-122	34 vo
Naphthalene	mg/kg (ppm)	2.5	2.8	66 b	51 b	39-120	26 b
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	49	39	35-117	23 vo

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/29/13
Date Received: 10/11/13
Project: Stadium Thriftway 080190, F&BI 310224

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	45	10-76
Chloromethane	mg/kg (ppm)	2.5	67	34-98
Vinyl chloride	mg/kg (ppm)	2.5	69	42-107
Bromomethane	mg/kg (ppm)	2.5	96	46-113
Chloroethane	mg/kg (ppm)	2.5	78	47-115
Trichlorofluoromethane	mg/kg (ppm)	2.5	77	53-112
Acetone	mg/kg (ppm)	12.5	104	39-147
1,1-Dichloroethene	mg/kg (ppm)	2.5	78	65-110
Methylene chloride	mg/kg (ppm)	2.5	94	62-119
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	95	72-122
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	83	71-113
1,1-Dichloroethane	mg/kg (ppm)	2.5	88	76-109
2,2-Dichloropropane	mg/kg (ppm)	2.5	91	64-151
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	85	77-110
Chloroform	mg/kg (ppm)	2.5	89	78-108
2-Butanone (MEK)	mg/kg (ppm)	12.5	95	60-121
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	92	80-109
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	88	72-116
1,1-Dichloropropene	mg/kg (ppm)	2.5	88	77-108
Carbon tetrachloride	mg/kg (ppm)	2.5	91	67-123
Benzene	mg/kg (ppm)	2.5	86	75-107
Trichloroethene	mg/kg (ppm)	2.5	85	72-107
1,2-Dichloropropane	mg/kg (ppm)	2.5	92	78-111
Bromodichloromethane	mg/kg (ppm)	2.5	97	75-126
Dibromomethane	mg/kg (ppm)	2.5	91	80-111
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	108	80-128
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	106	71-138
Toluene	mg/kg (ppm)	2.5	85	79-112
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	100	77-135
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	96	84-115
2-Hexanone	mg/kg (ppm)	12.5	100	71-129
1,3-Dichloropropane	mg/kg (ppm)	2.5	94	82-113
Tetrachloroethene	mg/kg (ppm)	2.5	90	77-110
Dibromochloromethane	mg/kg (ppm)	2.5	98	64-152
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	95	83-116
Chlorobenzene	mg/kg (ppm)	2.5	88	82-113
Ethylbenzene	mg/kg (ppm)	2.5	89	81-114
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	97	76-125
m,p-Xylene	mg/kg (ppm)	5	90	82-115
o-Xylene	mg/kg (ppm)	2.5	93	81-116
Styrene	mg/kg (ppm)	2.5	93	81-118
Isopropylbenzene	mg/kg (ppm)	2.5	90	81-117
Bromoform	mg/kg (ppm)	2.5	103	50-174
n-Propylbenzene	mg/kg (ppm)	2.5	91	82-116
Bromobenzene	mg/kg (ppm)	2.5	92	82-118
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	91	83-120
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	95	83-125
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	92	79-116
2-Chlorotoluene	mg/kg (ppm)	2.5	90	80-114
4-Chlorotoluene	mg/kg (ppm)	2.5	91	82-114
tert-Butylbenzene	mg/kg (ppm)	2.5	93	82-116
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	93	82-116
sec-Butylbenzene	mg/kg (ppm)	2.5	92	81-123
p-Isopropyltoluene	mg/kg (ppm)	2.5	89	82-124
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	88	80-118
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	84	79-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	89	80-118
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	95	71-131
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	90	75-122
Hexachlorobutadiene	mg/kg (ppm)	2.5	85	74-130
Naphthalene	mg/kg (ppm)	2.5	95	83-128
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	89	80-126

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.

A1 – More than one compound of similar molecule structure was identified with equal probability.

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 this range fell outside of acceptance criteria. The value reported is an estimate.

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

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

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. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

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

j – The result is below normal reporting limits. 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 analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is 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 compound indicated 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 in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

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.

310224

SAMPLE CHAIN OF CUSTODY

ME 10/11/13

VS1/C1 1

Send Report To Aspect

Company Alan Noell

Address 401 2nd Ave S, Suite 201

City, State, ZIP Seattle, WA 98104

Phone # ______ Fax # ______

SAMPLERS (signature)

PROJECT NAME/NO.	PO #
Stadium Thriftway	080190

REMARKS

Page # 1 of 1

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	Time	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	FOC	HOLD				Notes
MW-21-25	01 A-E	10/11/13	1350	SOIL	5				X			X					
MW-21-40	02		1405						X			X					
MW-21-55	03		1420						X			X					
MW-21-11	04		1326						*			*	~~X~~				*analyze per
MW-21-15.5	05		1335						*			*	~~X~~				AT 10/15/13
																	MS

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:	Eric Gessinger	Aspect	10/11/13	1630
Received by:	Nhan Phan	FeBI	10/11/13	1630
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

Samples received at 5 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

December 17, 2013

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on December 9, 2013 from the Morrell's Dry Cleaner 080190, F&BI 312118 project. There are 8 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: data@aspectconsulting.com, Parker Wittman, Joe Morrice
ASP1217R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 9, 2013 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Morrell's Dry Cleaner 080190, F&BI 312118 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
312118 -01	Trench-BT-W-4.5
312118 -02	Trench-BT-C-4.5
312118 -03	Trench-BT-E-4.5

The 8260C matrix spike and matrix spike duplicate failed the relative percent difference for dichlorofluoromethane. The analyte was not detected therefore the data were acceptable.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Trench-BT-W-4.5	Client:	Aspect Consulting, LLC
Date Received:	12/09/13	Project:	Morrell's Dry Cleaner, F&BI 312118
Date Extracted:	12/10/13	Lab ID:	312118-01
Date Analyzed:	12/10/13	Data File:	121011.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	62	142
Toluene-d8	96	51	121
4-Bromofluorobenzene	94	32	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	0.25
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Trench-BT-C-4.5	Client:	Aspect Consulting, LLC
Date Received:	12/09/13	Project:	Morrell's Dry Cleaner, F&BI 312118
Date Extracted:	12/10/13	Lab ID:	312118-02
Date Analyzed:	12/10/13	Data File:	121012.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	62	142
Toluene-d8	101	51	121
4-Bromofluorobenzene	97	32	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	0.26
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Trench-BT-E-4.5	Client:	Aspect Consulting, LLC
Date Received:	12/09/13	Project:	Morrell's Dry Cleaner, F&BI 312118
Date Extracted:	12/10/13	Lab ID:	312118-03
Date Analyzed:	12/10/13	Data File:	121013.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	62	142
Toluene-d8	97	51	121
4-Bromofluorobenzene	95	32	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	0.16
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Morrell's Dry Cleaner, F&BI 312118
Date Extracted:	12/10/13	Lab ID:	03-2518 mb
Date Analyzed:	12/10/13	Data File:	121008.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	62	142
Toluene-d8	97	51	121
4-Bromofluorobenzene	96	32	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 12/17/13
Date Received: 12/09/13
Project: Morrell's Dry Cleaner 080190, F&BI 312118

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

Laboratory Code: 312125-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	25	20	10-142	22 vo
Chloromethane	mg/kg (ppm)	2.5	<0.5	47	43	10-126	9
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	50	46	10-138	8
Bromomethane	mg/kg (ppm)	2.5	<0.5	62	54	10-163	14
Chloroethane	mg/kg (ppm)	2.5	<0.5	62	57	10-176	8
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	58	54	10-176	7
Acetone	mg/kg (ppm)	12.5	<0.5	83	79	10-163	5
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	66	63	10-160	5
Methylene chloride	mg/kg (ppm)	2.5	<0.5	69	66	10-156	4
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	74	74	21-145	0
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	72	68	14-137	6
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	72	70	19-140	3
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	79	78	10-158	1
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	75	72	25-135	4
Chloroform	mg/kg (ppm)	2.5	<0.05	74	71	21-145	4
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	82	79	19-147	4
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	74	71	12-160	4
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	77	75	10-156	3
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	71	69	17-140	3
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	84	82	9-164	2
Benzene	mg/kg (ppm)	2.5	0.035	72	70	29-129	3
Trichloroethene	mg/kg (ppm)	2.5	<0.03	75	73	21-139	3
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	77	76	30-135	1
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	82	79	23-155	4
Dibromomethane	mg/kg (ppm)	2.5	<0.05	76	76	23-145	0
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	87	85	24-155	2
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	85	84	28-144	1
Toluene	mg/kg (ppm)	2.5	<0.05	70	69	35-130	1
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	85	84	26-149	1
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	81	82	10-205	1
2-Hexanone	mg/kg (ppm)	12.5	<0.5	85	86	15-166	1
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	79	79	31-137	0
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	77	77	20-133	0
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	85	83	28-150	2
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	81	80	28-142	1
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	77	76	32-129	1
Ethylbenzene	mg/kg (ppm)	2.5	0.093	79	78	32-137	1
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	91	87	31-143	4
m,p-Xylene	mg/kg (ppm)	5	<0.1	80	78	34-136	3
o-Xylene	mg/kg (ppm)	2.5	<0.05	81	80	33-134	1
Styrene	mg/kg (ppm)	2.5	<0.05	82	81	35-137	1
Isopropylbenzene	mg/kg (ppm)	2.5	0.063	83	81	31-142	2
Bromoform	mg/kg (ppm)	2.5	<0.05	88	84	21-156	5
n-Propylbenzene	mg/kg (ppm)	2.5	0.33	83	83	23-146	0
Bromobenzene	mg/kg (ppm)	2.5	<0.05	81	79	34-130	2
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	83	81	18-149	2
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	83	83	28-140	0
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	80	78	25-144	3
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	79	78	31-134	1
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	80	78	31-136	3
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	83	82	30-137	1
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	0.082	81	79	10-182	2
sec-Butylbenzene	mg/kg (ppm)	2.5	0.050	84	83	23-145	1
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	84	82	21-149	2
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	80	78	30-131	3
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	79	78	29-129	1
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	82	81	31-132	1
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	96	91	11-161	5
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	82	80	22-142	2
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	82	80	10-142	2
Naphthalene	mg/kg (ppm)	2.5	1.4	82 b	82 b	14-157	0 b
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	80	77	20-144	4

Date of Report: 12/17/13
Date Received: 12/09/13
Project: Morrell's Dry Cleaner 080190, F&BI 312118

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	52	10-146
Chloromethane	mg/kg (ppm)	2.5	63	27-133
Vinyl chloride	mg/kg (ppm)	2.5	74	22-139
Bromomethane	mg/kg (ppm)	2.5	67	38-114
Chloroethane	mg/kg (ppm)	2.5	68	10-163
Trichlorofluoromethane	mg/kg (ppm)	2.5	81	10-196
Acetone	mg/kg (ppm)	12.5	97	52-141
1,1-Dichloroethene	mg/kg (ppm)	2.5	86	47-128
Methylene chloride	mg/kg (ppm)	2.5	84	42-132
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	88	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	88	67-127
1,1-Dichloroethane	mg/kg (ppm)	2.5	87	68-115
2,2-Dichloropropane	mg/kg (ppm)	2.5	96	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	89	72-113
Chloroform	mg/kg (ppm)	2.5	87	66-120
2-Butanone (MEK)	mg/kg (ppm)	12.5	96	57-123
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	86	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	93	62-131
1,1-Dichloropropene	mg/kg (ppm)	2.5	85	69-128
Carbon tetrachloride	mg/kg (ppm)	2.5	104	60-139
Benzene	mg/kg (ppm)	2.5	85	68-114
Trichloroethene	mg/kg (ppm)	2.5	88	64-117
1,2-Dichloropropane	mg/kg (ppm)	2.5	90	72-127
Bromodichloromethane	mg/kg (ppm)	2.5	96	72-130
Dibromomethane	mg/kg (ppm)	2.5	89	70-120
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	101	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	101	75-136
Toluene	mg/kg (ppm)	2.5	83	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	99	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	94	75-113
2-Hexanone	mg/kg (ppm)	12.5	95	33-152
1,3-Dichloropropane	mg/kg (ppm)	2.5	90	72-130
Tetrachloroethene	mg/kg (ppm)	2.5	91	72-114
Dibromochloromethane	mg/kg (ppm)	2.5	100	74-125
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	93	74-132
Chlorobenzene	mg/kg (ppm)	2.5	89	76-111
Ethylbenzene	mg/kg (ppm)	2.5	90	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	107	69-135
m,p-Xylene	mg/kg (ppm)	5	92	78-122
o-Xylene	mg/kg (ppm)	2.5	95	77-124
Styrene	mg/kg (ppm)	2.5	94	74-126
Isopropylbenzene	mg/kg (ppm)	2.5	95	76-127
Bromoform	mg/kg (ppm)	2.5	102	56-132
n-Propylbenzene	mg/kg (ppm)	2.5	91	74-124
Bromobenzene	mg/kg (ppm)	2.5	90	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	93	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	93	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	89	61-137
2-Chlorotoluene	mg/kg (ppm)	2.5	89	74-121
4-Chlorotoluene	mg/kg (ppm)	2.5	90	75-122
tert-Butylbenzene	mg/kg (ppm)	2.5	93	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	92	76-125
sec-Butylbenzene	mg/kg (ppm)	2.5	93	71-130
p-Isopropyltoluene	mg/kg (ppm)	2.5	94	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	91	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	90	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	93	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	108	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	93	64-135
Hexachlorobutadiene	mg/kg (ppm)	2.5	91	50-153
Naphthalene	mg/kg (ppm)	2.5	95	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	91	63-138

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.

A1 – More than one compound of similar molecule structure was identified with equal probability.

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 this range fell outside of acceptance criteria. The value reported is an estimate.

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

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

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. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

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

j – The result is below normal reporting limits. 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 analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is 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 compound indicated 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 in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

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.

312118

SAMPLE CHAIN OF CUSTODY

ME 12/09/13 VS1

Send Report To Alan Noell / Joe Morrice
Company Aspect Consulting
Address 401 2nd Ave S. #201
City, State, ZIP Seattle, WA 98104
Phone # ______ Fax # ______

SAMPLERS (signature) [signature]

PROJECT NAME/NO.	PO#
Morrell's Dry Cleaner 080190	

REMARKS

Page # 1 of 1

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	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
Trench-BT-W-4.5	01 A-D	12/9/13	1000	Soil	4				X									
Trench-BT-C-4.5	02	↓	1025	↓	↓				↓									
Trench-BT-E-4.5	03	↓	1140	↓	↓				↓									
												[redacted]						

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: [signature]	Eric Geissinger	Aspect	12/9/13	
Received by: [signature]	EDWARD -S	POSTAL	12/9/13	14:57
Relinquished by:				
Received by: [signature]	[illegible]	FBI inc	12/9/13	1524

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Kurt Johnson, B.S.
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3012 16th Avenue West
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(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 29, 2013

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on October 22, 2013 from the Stadium Thriftway 080190, F&BI 310404 project. There are 7 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: data@aspectconsulting.com, Parker Wittman
ASP1029R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on October 22, 2013 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Stadium Thriftway 080190, F&BI 310404 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
310404 -01	CAN-1
310404 -02	CAN-2

Several 8260C compounds failed below the acceptance criteria in the matrix spike samples. The laboratory control samples met the acceptance criteria, therefore the data were likely due to sample matrix effect.

Bromomethane in the 8260C laboratory control sample exceeded the acceptance criteria. The analyte was not detected in the sample, therefore the data were acceptable.

All other quality control requirements were acceptable.

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	CAN-1	Client:	Aspect Consulting, LLC
Date Received:	10/22/13	Project:	Stadium Thriftway, F&BI 310404
Date Extracted:	10/22/13	Lab ID:	310404-01
Date Analyzed:	10/22/13	Data File:	102226.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	50	150
Toluene-d8	100	50	150
4-Bromofluorobenzene	102	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	CAN-2	Client:	Aspect Consulting, LLC
Date Received:	10/22/13	Project:	Stadium Thriftway, F&BI 310404
Date Extracted:	10/22/13	Lab ID:	310404-02
Date Analyzed:	10/22/13	Data File:	102227.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	50	150
Toluene-d8	98	50	150
4-Bromofluorobenzene	102	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Stadium Thriftway, F&BI 310404
Date Extracted:	10/22/13	Lab ID:	03-2117 mb2
Date Analyzed:	10/22/13	Data File:	102211.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	50	150
Toluene-d8	101	50	150
4-Bromofluorobenzene	101	50	150

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

Date of Report: 10/29/13
Date Received: 10/22/13
Project: Stadium Thriftway 080190, F&BI 310404

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

Laboratory Code: 310382-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	8 vo	8 vo	10-56	0
Chloromethane	mg/kg (ppm)	2.5	<0.5	35	35	10-90	0
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	32	32	10-91	0
Bromomethane	mg/kg (ppm)	2.5	<0.5	98	103	10-110	5
Chloroethane	mg/kg (ppm)	2.5	<0.5	45	44	10-101	2
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	32	32	10-95	0
Acetone	mg/kg (ppm)	12.5	<0.5	65	59	11-141	10
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	42	40	11-103	5
Methylene chloride	mg/kg (ppm)	2.5	<0.5	68	64	14-128	6
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	74	69	17-134	7
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	51	47	13-112	8
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	61	56	23-115	9
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	59	53	18-117	11
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	61	57	25-120	7
Chloroform	mg/kg (ppm)	2.5	<0.05	66	61	29-117	8
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	72	63	20-133	13
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	68	63	22-124	8
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	52	47	27-112	10
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	46	42	26-107	9
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	46	42	22-115	9
Benzene	mg/kg (ppm)	2.5	<0.03	54	49	26-114	10
Trichloroethene	mg/kg (ppm)	2.5	<0.03	50	45	30-112	11
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	62	56	31-119	10
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	67	61	31-131	9
Dibromomethane	mg/kg (ppm)	2.5	<0.05	66	61	27-124	8
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	91	84	16-147	8
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	71	64	28-137	10
Toluene	mg/kg (ppm)	2.5	<0.05	46	42	34-112	9
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	67	61	30-136	9
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	75	69	32-126	8
2-Hexanone	mg/kg (ppm)	12.5	<0.5	79	73	17-147	8
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	67	60	29-125	11
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	31	30	27-110	3
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	65	58	32-143	11
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	61	57	32-126	7
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	51	45	37-113	12
Ethylbenzene	mg/kg (ppm)	2.5	1.9	34 b	25 b	38-111	31 b
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	60	53	35-126	12
m,p-Xylene	mg/kg (ppm)	5	1.8	34 b	29 b	38-112	16 b
o-Xylene	mg/kg (ppm)	2.5	3.5	30 b	17 b	38-113	55 b
Styrene	mg/kg (ppm)	2.5	<0.05	54	49	38-118	10
Isopropylbenzene	mg/kg (ppm)	2.5	1.8	25 b	18 b	37-114	33 b
Bromoform	mg/kg (ppm)	2.5	<0.05	65	57	18-155	13
n-Propylbenzene	mg/kg (ppm)	2.5	2.9	13 b	4 b	36-114	106 b
Bromobenzene	mg/kg (ppm)	2.5	<0.05	49	44	40-115	11
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	4.7	0 b	0 b	35-116	nm
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	86	77	33-128	11
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	67	59	33-123	13
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	39	36 vo	39-110	8
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	40	35 vo	39-111	13
tert-Butylbenzene	mg/kg (ppm)	2.5	0.099	28 vo	25 vo	36-116	11
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	13	0 b	0 b	35-116	nm
sec-Butylbenzene	mg/kg (ppm)	2.5	2.0	8 b	2 b	33-118	120 b
p-Isopropyltoluene	mg/kg (ppm)	2.5	1.9	7 b	3 b	32-119	80 b
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	37 vo	32 vo	38-111	14
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	37 vo	32 vo	39-109	14
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	44	39 vo	40-111	12
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	79	71	34-134	11
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	30 vo	25 vo	31-117	18
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	18 vo	16 vo	25-122	12
Naphthalene	mg/kg (ppm)	2.5	<0.05	55	47	39-120	16
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	32 vo	26 vo	35-117	21 vo

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/29/13
Date Received: 10/22/13
Project: Stadium Thriftway 080190, F&BI 310404

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	46	10-76
Chloromethane	mg/kg (ppm)	2.5	72	34-98
Vinyl chloride	mg/kg (ppm)	2.5	78	42-107
Bromomethane	mg/kg (ppm)	2.5	115 vo	46-113
Chloroethane	mg/kg (ppm)	2.5	87	47-115
Trichlorofluoromethane	mg/kg (ppm)	2.5	90	53-112
Acetone	mg/kg (ppm)	12.5	101	39-147
1,1-Dichloroethene	mg/kg (ppm)	2.5	90	65-110
Methylene chloride	mg/kg (ppm)	2.5	108	62-119
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	108	72-122
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	95	71-113
1,1-Dichloroethane	mg/kg (ppm)	2.5	101	76-109
2,2-Dichloropropane	mg/kg (ppm)	2.5	106	64-151
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	95	77-110
Chloroform	mg/kg (ppm)	2.5	101	78-108
2-Butanone (MEK)	mg/kg (ppm)	12.5	103	60-121
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	105	80-109
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	103	72-116
1,1-Dichloropropene	mg/kg (ppm)	2.5	102	77-108
Carbon tetrachloride	mg/kg (ppm)	2.5	102	67-123
Benzene	mg/kg (ppm)	2.5	98	75-107
Trichloroethene	mg/kg (ppm)	2.5	99	72-107
1,2-Dichloropropane	mg/kg (ppm)	2.5	105	78-111
Bromodichloromethane	mg/kg (ppm)	2.5	107	75-126
Dibromomethane	mg/kg (ppm)	2.5	103	80-111
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	124	80-128
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	117	71-138
Toluene	mg/kg (ppm)	2.5	97	79-112
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	109	77-135
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	108	84-115
2-Hexanone	mg/kg (ppm)	12.5	117	71-129
1,3-Dichloropropane	mg/kg (ppm)	2.5	104	82-113
Tetrachloroethene	mg/kg (ppm)	2.5	102	77-110
Dibromochloromethane	mg/kg (ppm)	2.5	101	64-152
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	109	83-116
Chlorobenzene	mg/kg (ppm)	2.5	99	82-113
Ethylbenzene	mg/kg (ppm)	2.5	102	81-114
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	106	76-125
m,p-Xylene	mg/kg (ppm)	5	102	82-115
o-Xylene	mg/kg (ppm)	2.5	106	81-116
Styrene	mg/kg (ppm)	2.5	108	81-118
Isopropylbenzene	mg/kg (ppm)	2.5	105	81-117
Bromoform	mg/kg (ppm)	2.5	104	50-174
n-Propylbenzene	mg/kg (ppm)	2.5	104	82-116
Bromobenzene	mg/kg (ppm)	2.5	106	82-118
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	106	83-120
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	108	83-125
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	105	79-116
2-Chlorotoluene	mg/kg (ppm)	2.5	102	80-114
4-Chlorotoluene	mg/kg (ppm)	2.5	104	82-114
tert-Butylbenzene	mg/kg (ppm)	2.5	107	82-116
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	107	82-116
sec-Butylbenzene	mg/kg (ppm)	2.5	106	81-123
p-Isopropyltoluene	mg/kg (ppm)	2.5	103	82-124
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	99	80-118
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	94	79-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	101	80-118
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	106	71-131
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	102	75-122
Hexachlorobutadiene	mg/kg (ppm)	2.5	95	74-130
Naphthalene	mg/kg (ppm)	2.5	113	83-128
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	100	80-126

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.

A1 – More than one compound of similar molecule structure was identified with equal probability.

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 this range fell outside of acceptance criteria. The value reported is an estimate.

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

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

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. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

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

j – The result is below normal reporting limits. 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 analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is 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 compound indicated 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 in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

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.

3/0404

SAMPLE CHAIN OF CUSTODY

ME 10/22/13

VS1/ CI1

Send Report To Alan Nuell

Company Aspect Consulting

Address

City, State, ZIP Seattle WA

Phone # ______ Fax # ______

SAMPLERS (signature)

PROJECT NAME/NO. Stadium Thriftway

PO# 080190

REMARKS

Page # 1 of 1

TURNAROUND TIME

☐ Standard (2 Weeks)

☒ RUSH 24 hour

Rush charges authorized by

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS							Notes
CAN-1	01 A-E	10/21/13	1230	SOIL	5				X									
CAN-2	02	10/21/13	1240	SOIL	5				X									

Samples received at 1 °C

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

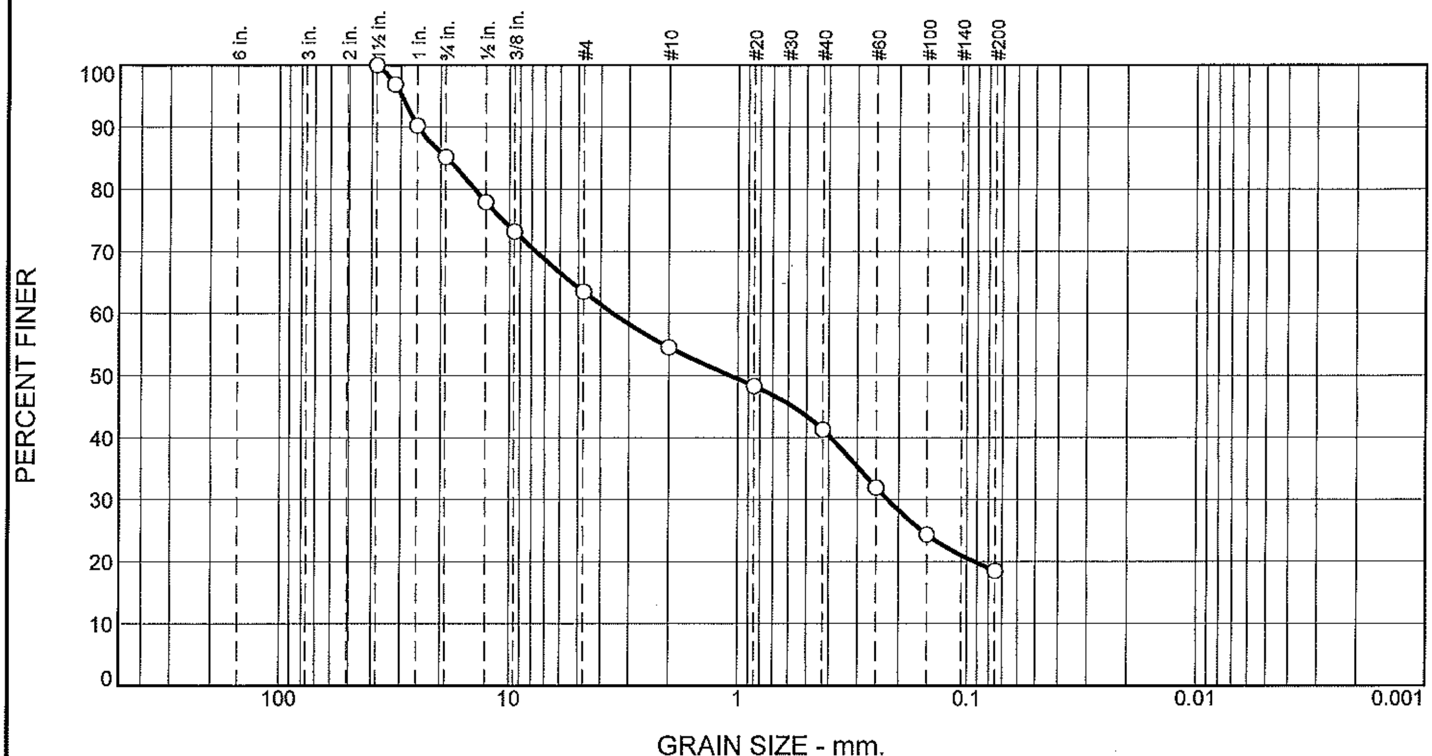
SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Amy Tice	Aspect	10/22/13	0845
Received by:	James Bruya	F&B	10/22	0845
Relinquished by:				
Received by:		Samples received at		

FORMS\COC\COC.DOC

APPENDIX D

Geotechnical Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	14.8	21.7	9.0	13.2	22.8	18.5	

Test Results (ASTM C136 & ASTM D1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1 1/2"	100.0		
1 1/4"	96.9		
1"	90.3		
3/4"	85.2		
1/2"	77.9		
3/8"	73.2		
#4	63.5		
#10	54.5		
#20	48.3		
#40	41.3		
#60	31.9		
#100	24.3		
#200	18.5		

* (no specification provided)

Material Description

Olive Brown Silty Sand with Gravel

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-1-b

Coefficients

D_{90}= 25.1377 D_{85}= 18.8124 D_{60}= 3.5313
D_{50}= 1.0854 D_{30}= 0.2234 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 10/15/2013 **Date Tested:** 10/22/13

Tested By: TEP

Checked By: JAM

Title:

Location: MW-21-20-30
Sample Number: 7557-1

Date Sampled:

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: Stadium Thriftway

Project No: 08-175 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

10/22/2013

Client: Aspect Consulting
Project: Stadium Thriftway
Project Number: 08-175
Location: MW-21-20-30
Sample Number: 7557-1
Material Description: Olive Brown Silty Sand with Gravel
Date Received: 10/15/2013
USCS Classification: SM **AASHTO Classification:** A-1-b
Grain Size Test Method: ASTM C136
#200 Wash Method: ASTM D1140
Tested By: TEP **Test Date:** 10/22/13
Checked By: JAM

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 3298.00
Tare Wt. = 774.10
Minus #200 from wash = 17.8%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
3844.90	774.10	1 1/2"	0.00	0.00	100.0
		1 1/4"	1428.20	1333.50	96.9
		1"	1673.60	1469.50	90.3
		3/4"	1660.90	1505.00	85.2
		1/2"	1642.70	1419.00	77.9
		3/8"	1628.40	1483.10	73.2
		#4	1654.40	1356.30	63.5
		#10	1788.70	1513.60	54.5
		#20	1257.80	1066.20	48.3
		#40	1158.50	943.70	41.3
		#60	1164.70	877.70	31.9
		#100	1075.90	842.80	24.3
		#200	1197.30	1019.10	18.5

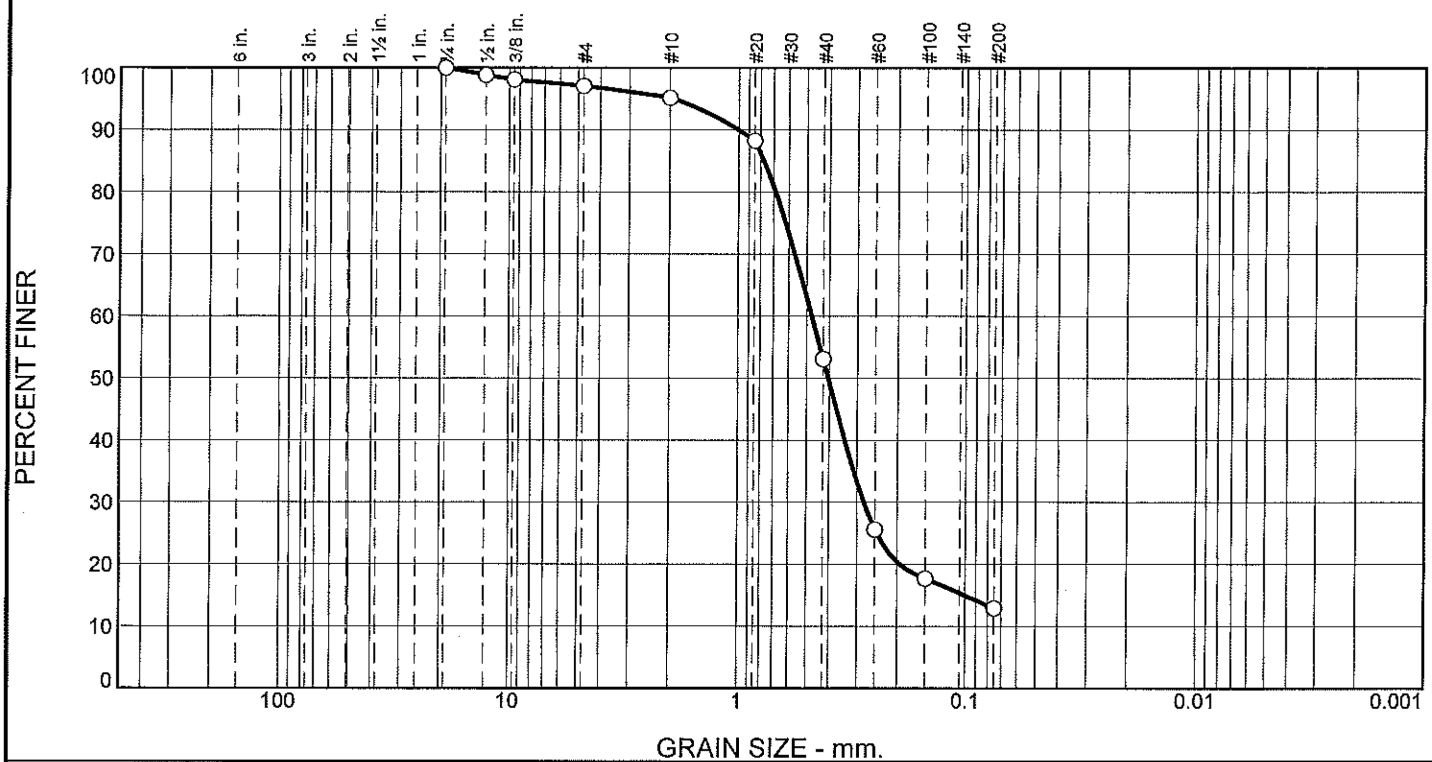
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	14.8	21.7	36.5	9.0	13.2	22.8	45.0			18.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0928	0.2234	1.0854	3.5313	14.2187	18.8124	25.1377	29.6453

Fineness Modulus
3.67

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.9	1.9	42.1	40.2	12.9	

Test Results (ASTM C136 & ASTM D1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/4"	100.0		
1/2"	98.8		
3/8"	98.1		
#4	97.1		
#10	95.2		
#20	88.3		
#40	53.1		
#60	25.6		
#100	17.7		
#200	12.9		

* (no specification provided)

Material Description

Olive Brown Silty Sand

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 1.0046 D_{85}= 0.7737 D_{60}= 0.4766
D_{50}= 0.4042 D_{30}= 0.2802 D_{15}= 0.1011
D_{10}= C_u= C_c=

Remarks

Date Received: 10/15/13 **Date Tested:** 10/22/13

Tested By: TEP

Checked By: JAM

Title:

Location: MW-21-35-45
Sample Number: 7557-2

Date Sampled:

Hayre McElroy & Associates, LLC

Redmond, WA

Client: Aspect Consulting
Project: Stadium Thriftway

Project No: 08-175 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

10/22/2013

Client: Aspect Consulting
Project: Stadium Thriftway
Project Number: 08-175
Location: MW-21-35-45
Sample Number: 7557-2
Material Description: Olive Brown Silty Sand
Date Received: 10/15/13
USCS Classification: SM
AASHTO Classification: A-2-4(0)
Grain Size Test Method: ASTM C136
#200 Wash Method: ASTM D1140
Tested By: TEP
Test Date: 10/22/13
Checked By: JAM

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 891.70
Tare Wt. = 198.10
Minus #200 from wash = 12.4%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
990.10	198.10	3/4"	0.00	0.00	100.0
		1/2"	1428.30	1419.10	98.8
		3/8"	1489.20	1483.20	98.1
		#4	1364.40	1356.30	97.1
		#10	1528.50	1513.50	95.2
		#20	1120.80	1066.10	88.3
		#40	1222.30	943.50	53.1
		#60	1095.30	877.60	25.6
		#100	905.10	842.80	17.7
		#200	1057.10	1019.00	12.9

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.9	2.9	1.9	42.1	40.2	84.2			12.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.1011	0.1946	0.2802	0.4042	0.4766	0.6878	0.7737	1.0046	1.9385

Fineness Modulus
1.94

APPENDIX E

Waste Disposition Reports

Chemical Waste Management of the Northwest
17629 Cedar Springs Lane
Arlington, OR 97812
(541) 454-3235
(541) 454-3237

INVOICE

THIS IS AN INVOICE FOR CURRENT CHARGES.
PLEASE PAY AMOUNT INDICATED BELOW

TERMS

DUE UPON RECEIPT OR PER CONTRACT

ALL PAST DUE AMOUNTS WILL BEAR INTEREST AT ONE AND ONE HALF PERCENT PER MONTH OR THE MAXIMUM RATE ALLOWED BY LAW, WHICHEVER IS LESS

(Kim)
213078

CLEARCREEK CONTRACTORS INC
ATTN: ACCOUNTS PAYABLE
3203 15TH ST
EVERETT WA 98201-1906

Invoice Date: 11/14/2013
Customer #: 450-1451430
Invoice #: 2236-0096992
Page #: 1

Manifest#	Profile	Description	Gener/Quantity	P.O.#/Unit	Biller	Rate	Total
0000430563	OR321674	LF04 - F-LISTED SOIL	009403 WALKER CHEVROLE	WALKER CHEVY	NFLETCHE	Svc Date	11/08/2013
	DIRECT LANDFILL	DISPOSAL	10.01	TONS			
	FUEL ENV & ADMIN FEE	DISPOSAL	705.71	PERCENT			
	CONTAINER DELIVERY	TRANSPORTATION	1.00	TRIP			
	LINER	TRANSPORTATION	1.00	LINER			
	RAILCAR TRANSPORT	TRANSPORTATION	1.00	CONTAINER			
	CONTAINER RENTAL	TRANSPORTATION	28.00	DAY			
	PROFILE FEE	PROFILE RUSH FEE	1.00	EACH			
	STATE WASTE MGMT FEE		10.01	TONS			
		MANIFEST DOCUMENT 001823357JJK					
						Subtotal	
0000430564	OR321674	LF04 - F-LISTED SOIL	009403 WALKER CHEVROLE	WALKER CHEVY	NFLETCHE	Svc Date	11/08/2013
	DIRECT LANDFILL	DISPOSAL	14.58	TONS			
	FUEL ENV & ADMIN FEE	DISPOSAL	1,027.89	PERCENT			
	CONTAINER DELIVERY	TRANSPORTATION	1.00	TRIP			
	RAILCAR TRANSPORT	TRANSPORTATION	1.00	CONTAINER			
	LINER	TRANSPORTATION	1.00	LINER			
	CONTAINER RENTAL	TRANSPORTATION	23.00	DAY			
	STATE WASTE MGMT FEE		14.58	TONS			
		MANIFEST DOCUMENT 001823358JJK					
						Subtotal	

AS REQUIRED BY 40 CFR 264.12 (b), WM IS NOTIFYING YOU THAT THIS FACILITY HAS THE APPROPRIATE PERMIT(S) FOR, AND WILL ACCEPT THE WASTE YOU THE GENERATOR IS SHIPPING.

Darren D 5500.50

Remit to: CHEMICAL WASTE MANAGEMENT, INC.
P.O. BOX 660345
DALLAS, TX 75266

Total Due

WASTE MANAGEMENT

WASTE MANAGEMENT
17629 Cedar Springs Lane
Arlington, OR 97812

NOV 29 2013

WALKER CHEVROLET
WAD027555184
633 DIVISION AVE
TACOMA WA 98403

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc., ORD089452353, has received the following waste material:

GENERATOR:	WALKER CHEVROLET
MANIFEST #:	001823358JJK
CWM TRACKING ID:	430564-01
PROFILE #:	OR321674
LINE ITEM:	9b.1
QUANTITY:	1 CM
RECEIVED DATE:	11/08/13
DISPOSAL PROCESS(ES):	LANDFILL
FINAL DISPOSAL LOCATION:	LANDFILL 14
DISPOSAL DATE:	11/12/13

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste material was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Becky Sumner

CWMNW RECORDS DEPARTMENT
Date: 11/18/13

WASTE MANAGEMENT

RECEIVED
NOV 29 2013
By

WASTE MANAGEMENT
17629 Cedar Springs Lane
Arlington, OR 97812

WALKER CHEVROLET
WAD027555184
633 DIVISION AVE
TACOMA WA 98403

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc., ORD089452353, has received the following waste material:

GENERATOR:	WALKER CHEVROLET	
MANIFEST #:	001823357JJK	
CWM TRACKING ID:	430563-01	
PROFILE #:	OR321674	
LINE ITEM:	9b.1	
QUANTITY:	1 CM	
RECEIVED DATE:	11/08/13	
DISPOSAL PROCESS(ES):	LANDFILL	
FINAL DISPOSAL LOCATION:	LANDFILL	14
DISPOSAL DATE:	11/08/13	

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste material was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Becky Sumner

CWMNW RECORDS DEPARTMENT
Date: 11/18/13

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	WAD [illegible]
2. Page 1 of	1
3. Emergency Response Phone	([illegible]) [illegible]
4. Manifest Tracking Number	001823357 JJK

GENERATOR

5. Generator's Name and Mailing Address

WALKER CHEVROLET
[illegible] DIVISION AVE
TACOMA, WA 98103

Generator's Site Address (if different than mailing address)

Generator's Phone: ([illegible]) [illegible]

6. Transporter 1 Company Name: R TRANSPORT INC — U.S. EPA ID Number: WAH[illegible]

7. Transporter 2 Company Name: UNION PACIFIC RAILROAD — U.S. EPA ID Number: NED[illegible]

8. Designated Facility Name and Site Address — U.S. EPA ID Number: ORD[illegible]

CHEMICAL WASTE MANAGEMENT INC
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709

Facility's Phone: (503) 45[illegible]

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. [illegible] HAZARDOUS WASTE, SOLID, N.O.S. [illegible]	001	CM		[illegible]	[illegible]
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information

[illegible] SOIL MEETING TREATMENT STANDARDS, ERG# 171 (RQ = 10 LBS)
ER/P = CHEMTREC ([illegible]) CONTAINER# [illegible]

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name	Signature	Month	Day	Year

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

	Printed/Typed Name	Signature	Month	Day	Year
Transporter 1			11		
Transporter 2					

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name	Signature	Month	Day	Year

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
WAD [illegible]	1	(800) 424-9300	001823358 JJK

5. Generator's Name and Mailing Address

[illegible] CHEVROLET
833 DIVISION AVE
TACOMA WA [illegible]

Generator's Site Address (if different than mailing address)

Generator's Phone: (425) 252 [illegible]

6. Transporter 1 Company Name	U.S. EPA ID Number
R TRANSPORT INC	WAH [illegible]

7. Transporter 2 Company Name	U.S. EPA ID Number
UNION PACIFIC RAILROAD	NED001792910

8. Designated Facility Name and Site Address	U.S. EPA ID Number
CHEMICAL WASTE MANAGEMENT INC 17629 CEDAR SPRINGS LANE ARLINGTON OR 97812 9709	ORD089452353

Facility's Phone: [illegible]

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
	1. [illegible] HAZARDOUS WASTE SOLID N.O.S. [illegible]	001	CM	[illegible]	P	[illegible]		
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information

1 OR321674 SOIL MEETING TREATMENT STANDARDS, ERG# 171 (RQ = 10 LBS)
E/R/P = CHEMTREC (#CCN24117) CONTAINER# 910210

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name	Signature	Month	Day	Year

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name	Signature	Month	Day	Year

Transporter 2 Printed/Typed Name	Signature	Month	Day	Year

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator)	Month	Day	Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name	Signature	Month	Day	Year

GENERATOR | INT'L | TRANSPORTER | DESIGNATED FACILITY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

June 26, 2013

Michael J. Bonds, Attorney and Agent
Schedler Bond, PLLC
2448 - 76th Avenue SE, Suite 202
Mercer Island, WA 98040

RE: Contained-in Determination for soils contaminated with listed dangerous waste constituents located at 608 North First Street, Tacoma, WA
RCRA Site ID No. WAD027555184

References:

(a) Request for Contained-in Determination from Alan Noell (Aspect Consulting) dated June 12, 2013 to Ava Edmonson (Ecology).
(b) Request for Contained-in Determination from Alan Noell (Aspect Consulting) dated June 12, 2013 to Samuel Iwenofu (Ecology) received via electronic mail.

Dear Mr. Bonds:

The Washington State Department of Ecology (Ecology) received a Contained-in Determination request for approximately fifteen (15) tons of soil containing F001 listed dangerous waste constituents generated during cleanup action at 608 North First Street (former Morrell's Dry Cleaner), Tacoma, Washington.

Analytical data for the contaminated soils and supplemental information were submitted to Ecology to determine if the soils contaminated with listed dangerous waste constituent should be managed as dangerous wastes according to the "Contained-In/Out Policy." Ecology understands that these specific soils do not designate under federal characteristics (WAC 173-303-090) or state-only criteria (WAC 173-303-100).

Based on the information received and reviewed, Ecology has determined that these soils are contaminated with listed dangerous waste constituent at concentrations that do not warrant management as dangerous wastes,[1] and Ecology will not require disposal of these soils as listed wastes at a RCRA permitted treatment, storage, and disposal (TSD) facility, provided all of the conditions below are implemented:

[1] February 19, 1993 Ecology Contained-In Policy Memo

1. The contaminated soils should be kept completely covered and contained during transport and disposal. If the soil should be emptied directly into a truck or trailer, the delivery truck or rail car shall be plastic lined, and during transport, all loads must be covered to prevent wind dispersion. All other adequate measures shall be taken to prevent spills and dispersion due to wind or rain erosion. Measures shall also be taken to prevent unauthorized contact with these soils and groundwater at all times.

2. Directly deliver these soils to a permitted **RCRA Subtitle D** Waste Management Landfill in Arlington, Oregon, as proposed in your request. Please be aware that local solid waste agencies have the authority to impose additional requirements on solid waste streams.

3. The contaminated soils shall be placed directly in the landfill cell, and are not to be used for daily, intermediate, or final cover.

4. These contaminated soils shall not be sent to any incinerator, thermal desorption unit, or recycling facility unless that facility is a RCRA Subtitle C permitted hazardous waste TSD facility.

5. Copies of all bills of lading/weight (scale) tickets and signed solid waste landfill receipt records for these contaminated soils should be forwarded, **within 10 days of your receipt**, to Ecology's Southwest Regional Office, Attention: Samuel Iwenofu.

Ecology issued this determination based on the information provided and reviewed to date. This written decision does not apply to any other area or media. Additional Contained-in Determination requests would be required for on-going and future investigation and cleanup activities.

This letter is intended to only address the procedures for disposal of fifteen (15) tons of contaminated soil in accordance with Washington State's Dangerous Waste Regulations (Chapter 173-303 WAC). Regulatory decisions regarding the applicable soil and groundwater cleanup levels and appropriate exposure pathways will be addressed by project managers in Ecology's Toxics Cleanup Program.

Failure to comply with the terms of this letter may result in the issuance of an administrative order and/or penalty as provided by the Revised Code of Washington, Sections 70.105.080 and/or .095 (Hazardous Waste Management Act).

If you have questions regarding this letter, please contact Samuel Iwenofu of my staff at (360) 407-6346 or electronically at siwe461@ecy.wa.gov.

Sincerely,

Ava M Edmonson

Ava Edmonson, Section Manager
Hazardous Waste and Toxics Reduction Program
Southwest Regional Office

BY CERTIFIED MAIL

91 7199 9991 7031 7885 9318

cc: Central Files
Samuel Iwenofu, Department of Ecology
Eugene Radcliff, Department of Ecology
Dean Yasuda, Department of Ecology
Alan Noell; anoell@aspectconsulting.com

Customer Summary Report

Criteria: 12/15/2013 12:00 AM to 12/31/2013 11:59 PM

Business Unit Name: Columbia Ridge Landfill & Recycling Center - S04247 (USA)

Customer Name: CLEARCREEK CONTRACTORS INC (CLEARCREEK CONTRACTORS INC)

Ticket Date	Ticket ID	Cust Code	Generator	Profile	Truck	Tons	Total
12/16/2013	179621	0000146	OR-WALKER CHEVROLET	108209WA	718D	16.21	
Customer Totals	1					16.21	

213078

2500-1

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original 242438
Ticket# 179621

Customer Name CLEARCREEK CONTRACTORS INC CL
Ticket Date 12/16/2013
Payment Type Credit Account
Manual Ticket# 793222
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 108209WA (CM~CONTAINED IN WASTE~CLEARCREEK CONTRACTORS~WALKER CHEVROLET~1082
Generator OR-WALKER CHEVROLET WALKER CHEVROLET 608 N FIRST ST

Carrier 7000
Vehicle# 7180
Container 7180
Billing # 0000146
Manifest
PO 213078

Volume

	Time	Scale	Operator	Inbound		
In	12/12/2013 11:58:55	MANUAL WT	SMastrio		Gross	40200 lb*
Out	12/16/2013 11:58:55		SMastrio		Tare	7780 lb*
			* Manual Weight		Net	32420 lb
					Tons	16.21

Comments Rental 12/5-12/10 = 5 days
Dropped 12/05/13

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	Cont Soil Sp. W.-T	100	16.21	Tons				WA-TACOMA
2	DEL U SPW-DELIVERY	100	1	Each				WA-TACOMA
3	FEA T SPW-FUEL,ENV	100	16.21	Tons				WA-TACOMA
4	RENT SPW DAILY-CAN	100	5	Each				WA-TACOMA
5	LINER SPW-LINER UN	100	1	Each				WA-TACOMA
6	LOC U SPW-LOCAL TR	100	1	Load				WA-TACOMA
7	[illegible]	100	1	Load				[illegible]

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

№ 793222

DATE:/TIME: 2013 DEZ 16 PM1:27:14
LOAD DATE:
CUSTOMER: Clear Creek / Walker Cherry,
PROFILE NUMBER: 108209WA
TRUCK NUMBER:
TRAILER/CONTAINER NUMBER: 7180
SEAL NUMBER:
CUSTOMER INVOICE NO.:

GROSS WEIGHT: 40200
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 7780
NET WEIGHT: 32420

GATEHOUSE: DEW
DRIVER: OM
TRAIN ID: Usage 11 ORIGIN:
WASTE TYPE: Contained in Waste
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:
Rental 12/5-12/10 = 5 days

Dropped 12/05
HAULER: RT

902-ARLINGTON

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 007598154FLE Contract# 7610

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	WAD027555184	1	1-800-424-9300	007598154 FLE

5. Generator's Name and Mailing Address

WALKER CHEVROLET
633 DIVISION AVENUE
TACOMA, WA 98403

Generator's Phone: (425) 252-5800 146301

Generator's Site Address (if different than mailing address)

6. Transporter 1 Company Name: EMERALD SERVICES, INC. — U.S. EPA ID Number: WAD058364647

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address — U.S. EPA ID Number: IDD073114654

US ECOLOGY IDAHO, INC.
20400 LEMLEY RD
GRAND VIEW, ID 83624

Facility's Phone: (800) 274-1516

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ, NA3082, Hazardous waste, liquid, n.o.s. (TRICHLOROETHENE, TETRACHLOROETHENE), 9, PGIII, RQ-10, ERG#171	008	DM	440	G	D039 D040 F002
X	2. RQ, NA 3082, HAZARDOUS WASTE, LIQUID, N.O.S. (TRICHLOROETHENE, TETRACHLOROETHENE), 9, PG III, RQ-10 ERG #171	001	DM	30	G	D039 D040 F002
	3.					
	4.					

14. Special Handling Instructions and Additional Information

1)23418 GROUNDWATER WITH CHLORINATED SOLVENTS
2)23418 GROUNDWATER WITH CHLORINATED SOLVENTS

REPORT ANY 'RQ' DISCHARGE TO NATIONAL RESPONSE CENTER 800-424-8802, AND 911 EMERGENCY NUMBER OR LOCAL OPERATOR. GENERATOR CONTACT: KIM CURNETT (425) 252-5800

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name — Signature — Month 2 Day 11 Year 14

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: ______
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: HERNAN ARMAS — Signature — Month 2 Day 11 Year 14
Transporter 2 Printed/Typed Name — Signature — Month Day Year

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name — Signature — Month Day Year

GENERATOR / INT'L / TRANSPORTER / DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. GENERATOR'S INITIAL COPY

APPENDIX F

Soil Vapor Extraction Air Analytical Results

eurofins | Air Toxics

2/11/2014
Mr. Eric Marhofer
Aspect Consulting LLC
401 Second Avenue South
Suite 201
Seattle WA 98104

Project Name: Walker Chevrolet
Project #: 080190
Workorder #: 1401402A

Dear Mr. Eric Marhofer

The following report includes the data for the above referenced project for sample(s) received on 1/28/2014 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner
Project Manager

eurofins | Air Toxics

WORK ORDER #: 1401402A

Work Order Summary

CLIENT:	Mr. Eric Marhofer Aspect Consulting LLC 401 Second Avenue South Suite 201 Seattle, WA 98104	**BILL TO:**	Accounts Payable Aspect Consulting LLC 350 Madison Ave N Bainbridge Island, WA 98110
PHONE:	206-838-6582	**P.O. #**	080190-004
FAX:	206-838-5853	**PROJECT #**	080190 Walker Chevrolet
DATE RECEIVED:	01/28/2014	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	02/11/2014		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	PT-H1-012114	Modified TO-15	1.4 "Hg	15.4 psi
02A	PT-H2-012114	Modified TO-15	0.4 "Hg	14.8 psi
03A	PT-GT1-012214	Modified TO-15	2.4 "Hg	14.9 psi
04A	PT-GT2-012214	Modified TO-15	0.8 "Hg	14.4 psi
05A	PT-AO1-012214	Modified TO-15	3.3 "Hg	15.1 psi
06A	PT-AO2-012214	Modified TO-15	0 psi	14.9 psi
07A	Lab Blank	Modified TO-15	NA	NA
08A	CCV	Modified TO-15	NA	NA
09A	LCS	Modified TO-15	NA	NA
09AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 02/11/14

Technical Director

Certification numbers: AZ Licensure AZ0775, CA NELAP - 12282CA, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-13-6, UT NELAP CA009332013-4, VA NELAP - 460197, WA NELAP - C935
Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2013, Expiration date: 10/17/2014.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

eurofins | Air Toxics

LABORATORY NARRATIVE
EPA Method TO-15 Soil Gas
Aspect Consulting LLC
Workorder# 1401402A

Six 1 Liter Summa Canister (100% Certified) samples were received on January 28, 2014. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 50 mLs of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

Despite the use of flow controllers for sample collection, the final canister vacuums for sample PT-AO2-012214 was measured at ambient pressure. These ambient pressure readings were confirmed by the laboratory upon sample receipt.

There was a significant difference (greater than 5.0" Hg) between the measured canister receipt vacuum and that which was reported on the Chain of Custody (COC) for sample PT-H2-012114. A leak test indicated that the valve was functioning properly.

Analytical Notes

Dilution was performed on samples PT-H1-012114, PT-H2-012114, PT-GT1-012214, PT-AO1-012214 and PT-AO2-012214 due to the presence of high level target species.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates

as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

eurofins | Air Toxics

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS

Client Sample ID: PT-H1-012114

Lab ID#: 1401402A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	110	90000	730	610000

Client Sample ID: PT-H2-012114

Lab ID#: 1401402A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	100	83000	690	570000

Client Sample ID: PT-GT1-012214

Lab ID#: 1401402A-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	36	510	200	2800
cis-1,2-Dichloroethene	36	730	140	2900
Tetrachloroethene	36	24000	250	160000

Client Sample ID: PT-GT2-012214

Lab ID#: 1401402A-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	10	180	55	1000
cis-1,2-Dichloroethene	10	260	40	1000
Tetrachloroethene	10	7400	69	50000

Client Sample ID: PT-AO1-012214

Lab ID#: 1401402A-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	57	130	140	320
Trichloroethene	57	5400	310	29000
cis-1,2-Dichloroethene	57	15000	220	60000
Tetrachloroethene	57	44000	390	300000

Summary of Detected Compounds
EPA METHOD TO-15 GC/MS

Client Sample ID: PT-AO2-012214

Lab ID#: 1401402A-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	50	120	130	310
Trichloroethene	50	6300	270	34000
cis-1,2-Dichloroethene	50	14000	200	58000
Tetrachloroethene	50	46000	340	310000

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Client Sample ID: PT-H1-012114

Lab ID#: 1401402A-01A

EPA METHOD TO-15 GC/MS

File Name:	**14020512**	**Date of Collection:**	**1/21/14 11:30:00 AM**
Dil. Factor:	**21.5**	**Date of Analysis:**	**2/5/14 04:40 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	110	Not Detected	270	Not Detected
trans-1,2-Dichloroethene	110	Not Detected	430	Not Detected
Trichloroethene	110	Not Detected	580	Not Detected
cis-1,2-Dichloroethene	110	Not Detected	430	Not Detected
Tetrachloroethene	110	90000	730	610000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: PT-H2-012114

Lab ID#: 1401402A-02A

EPA METHOD TO-15 GC/MS

File Name:	**14020513**	**Date of Collection:**	**1/21/14 3:00:00 PM**
Dil. Factor:	**20.3**	**Date of Analysis:**	**2/5/14 05:16 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	100	Not Detected	260	Not Detected
trans-1,2-Dichloroethene	100	Not Detected	400	Not Detected
Trichloroethene	100	Not Detected	540	Not Detected
cis-1,2-Dichloroethene	100	Not Detected	400	Not Detected
Tetrachloroethene	100	83000	690	570000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: PT-GT1-012214

Lab ID#: 1401402A-03A

EPA METHOD TO-15 GC/MS

File Name:	**14020514**	**Date of Collection:**	**1/22/14 10:30:00 AM**
Dil. Factor:	**7.30**	**Date of Analysis:**	**2/5/14 06:09 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	36	Not Detected	93	Not Detected
trans-1,2-Dichloroethene	36	Not Detected	140	Not Detected
Trichloroethene	36	510	200	2800
cis-1,2-Dichloroethene	36	730	140	2900
Tetrachloroethene	36	24000	250	160000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	110	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: PT-GT2-012214

Lab ID#: 1401402A-04A

EPA METHOD TO-15 GC/MS

File Name:	**14020515**	**Date of Collection:**	**1/22/14 12:15:00 PM**
Dil. Factor:	**2.04**	**Date of Analysis:**	**2/5/14 06:33 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	10	Not Detected	26	Not Detected
trans-1,2-Dichloroethene	10	Not Detected	40	Not Detected
Trichloroethene	10	180	55	1000
cis-1,2-Dichloroethene	10	260	40	1000
Tetrachloroethene	10	7400	69	50000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	109	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: PT-AO1-012214

Lab ID#: 1401402A-05A

EPA METHOD TO-15 GC/MS

File Name:	**14020516**	**Date of Collection:**	**1/22/14 1:10:00 PM**
Dil. Factor:	**11.4**	**Date of Analysis:**	**2/5/14 07:02 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	57	130	140	320
trans-1,2-Dichloroethene	57	Not Detected	220	Not Detected
Trichloroethene	57	5400	310	29000
cis-1,2-Dichloroethene	57	15000	220	60000
Tetrachloroethene	57	44000	390	300000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: PT-AO2-012214

Lab ID#: 1401402A-06A

EPA METHOD TO-15 GC/MS

File Name:	**14020517**	**Date of Collection:**	**1/22/14 4:45:00 PM**
Dil. Factor:	**10.0**	**Date of Analysis:**	**2/5/14 07:27 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	50	120	130	310
trans-1,2-Dichloroethene	50	Not Detected	200	Not Detected
Trichloroethene	50	6300	270	34000
cis-1,2-Dichloroethene	50	14000	200	58000
Tetrachloroethene	50	46000	340	310000

Container Type: 1 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1401402A-07A

EPA METHOD TO-15 GC/MS

File Name:	**14020505**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/5/14 08:43 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	5.0	Not Detected	13	Not Detected
trans-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
Trichloroethene	5.0	Not Detected	27	Not Detected
cis-1,2-Dichloroethene	5.0	Not Detected	20	Not Detected
Tetrachloroethene	5.0	Not Detected	34	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: CCV

Lab ID#: 1401402A-08A

EPA METHOD TO-15 GC/MS

File Name:	**14020502**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 2/5/14 06:44 AM**

Compound	%Recovery
Vinyl Chloride	94
trans-1,2-Dichloroethene	92
Trichloroethene	88
cis-1,2-Dichloroethene	88
Tetrachloroethene	91

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: LCS

Lab ID#: 1401402A-09A

EPA METHOD TO-15 GC/MS

File Name:	**14020503**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 2/5/14 07:09 AM**

Compound	%Recovery	Method Limits
Vinyl Chloride	113	70-130
trans-1,2-Dichloroethene	96	70-130
Trichloroethene	109	70-130
cis-1,2-Dichloroethene	119	70-130
Tetrachloroethene	110	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: LCSD

Lab ID#: 1401402A-09AA

EPA METHOD TO-15 GC/MS

File Name:	**14020504**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 2/5/14 07:45 AM**

Compound	%Recovery	Method Limits
Vinyl Chloride	118	70-130
trans-1,2-Dichloroethene	96	70-130
Trichloroethene	108	70-130
cis-1,2-Dichloroethene	119	70-130
Tetrachloroethene	109	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	101	70-130

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Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Page 1 of 1

Project Manager Alan Noell
Collected by: (Print and Sign) Eric Bassinger
Company Aspect Consulting Email anoell@aspectconsulting.com
Address 401 2nd Ave S #201 City Seattle State WA Zip 98104
Phone ______ Fax ______

Project Info:
P.O. # 080190-004
Project # 080190
Project Name Walker Chevrolet

Turn Around Time: ☒ Normal ☐ Rush ______ specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	PT-H1-012114	36455	1/21/14	1130		-30	-5		
02A	PT-H2-012114	2223	1/21/14	1500		-30	-6		
03A	PT-GT1-012214	33651	1/22/14	1030		-30	-5		
04A	PT-GT2-012214	37653	1/22/14	1215		-29.5	-3.5		
05A	PT-A01-012214	8011	1/22/14	1310		-30	-5.5		
06A	PT-A02-012214	37687	1/22/14	1645		-30	-3.5		
	INDOOR-012214	22512	1/22/14	1555		-30	-5.5		
	OUTDOOR-012214	6L0044	1/22/14	1015		-30	-7		
	SUBSLAB-012314	35988	1/23/14	1315		-30	-8.5		

Relinquished by: (signature) Date/Time	Received by: (signature) Date/Time	Notes:
[signature] 1/24/14 1000	[signature] ATL 1.28.14 1000	
Relinquished by: (signature) Date/Time	Received by: (signature) Date/Time	
Relinquished by: (signature) Date/Time	Received by: (signature) Date/Time	

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	FedEx		NA	Good	Yes No **None**	1401402

Form 1293 rev.11

APPENDIX G

Groundwater Analytical Results

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

January 6, 2014

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on December 13, 2013 from the Walker Chevrolet 080190-004-11, F&BI 312204 project. There are 13 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: data@aspectconsulting.com, Parker Wittman
ASP0106R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 13, 2013 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Walker Chevrolet 080190-004-11, F&BI 312204 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
312204 -01	MW-18-121213
312204 -02	MW-2-121213

The samples were sent to Aquatic Research for nitrate, nitrite, sulfate, and total organic carbon analyses. Review of the enclosed report indicates that all quality assurance were acceptable.

Chloroform was detected in the 8260C analysis. The data were flagged as due to possible laboratory contamination.

Bromomethane in the 8260C matrix spike, laboratory control sample and laboratory control sample duplicate exceeded the acceptance criteria. The analyte was not detected in the sample, therefore the data were acceptable.

1,2,3-Trichlorobenze was detected in the 8260C method blank. The result was flagged as laboratory contamination.

All other quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-18-121213	Client:	Aspect Consulting, LLC
Date Received:	12/13/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/20/13	Lab ID:	312204-01
Date Analyzed:	12/20/13	Data File:	312204-01.057
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	98	60	125

Analyte:	Concentration ug/L (ppb)
Iron	216

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-2-121213	Client:	Aspect Consulting, LLC
Date Received:	12/13/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/20/13	Lab ID:	312204-02
Date Analyzed:	12/20/13	Data File:	312204-02.058
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	104	60	125

Analyte:	Concentration ug/L (ppb)
Iron	6,170

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/20/13	Lab ID:	I3-867 mb
Date Analyzed:	12/20/13	Data File:	I3-867 mb.049
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	99	60	125

Analyte:	Concentration ug/L (ppb)
Iron	<10

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-18-121213	Client:	Aspect Consulting, LLC
Date Received:	12/13/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/16/13	Lab ID:	312204-01
Date Analyzed:	12/16/13	Data File:	121613.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	50	150
Toluene-d8	97	50	150
4-Bromofluorobenzene	95	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	490 ve
Vinyl chloride	0.53	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	350 ve	Bromobenzene	<1
Chloroform	1.3 lc	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	57	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-18-121213	Client:	Aspect Consulting, LLC
Date Received:	12/13/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/16/13	Lab ID:	312204-01 1/10
Date Analyzed:	12/16/13	Data File:	121620.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	50	150
Toluene-d8	96	50	150
4-Bromofluorobenzene	95	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	1,3-Dichloropropane	<10
Chloromethane	<100	Tetrachloroethene	460
Vinyl chloride	<2	Dibromochloromethane	<10
Bromomethane	<10	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	<10
Acetone	<100	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	<20
Methylene chloride	<50	o-Xylene	<10
Methyl t-butyl ether (MTBE)	<10	Styrene	<10
trans-1,2-Dichloroethene	<10	Isopropylbenzene	<10
1,1-Dichloroethane	<10	Bromoform	<10
2,2-Dichloropropane	<10	n-Propylbenzene	<10
cis-1,2-Dichloroethene	360	Bromobenzene	<10
Chloroform	<10	1,3,5-Trimethylbenzene	<10
2-Butanone (MEK)	<100	1,1,2,2-Tetrachloroethane	<10
1,2-Dichloroethane (EDC)	<10	1,2,3-Trichloropropane	<10
1,1,1-Trichloroethane	<10	2-Chlorotoluene	<10
1,1-Dichloropropene	<10	4-Chlorotoluene	<10
Carbon tetrachloride	<10	tert-Butylbenzene	<10
Benzene	<3.5	1,2,4-Trimethylbenzene	<10
Trichloroethene	54	sec-Butylbenzene	<10
1,2-Dichloropropane	<10	p-Isopropyltoluene	<10
Bromodichloromethane	<10	1,3-Dichlorobenzene	<10
Dibromomethane	<10	1,4-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dichlorobenzene	<10
cis-1,3-Dichloropropene	<10	1,2-Dibromo-3-chloropropane	<100
Toluene	<10	1,2,4-Trichlorobenzene	<10
trans-1,3-Dichloropropene	<10	Hexachlorobutadiene	<10
1,1,2-Trichloroethane	<10	Naphthalene	<10
2-Hexanone	<100	1,2,3-Trichlorobenzene	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-2-121213	Client:	Aspect Consulting, LLC
Date Received:	12/13/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/16/13	Lab ID:	312204-02
Date Analyzed:	12/16/13	Data File:	121614.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	50	150
Toluene-d8	98	50	150
4-Bromofluorobenzene	96	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	1,600 ve
Vinyl chloride	0.84	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	2.7	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	1,100 ve	Bromobenzene	<1
Chloroform	3.3 lc	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	840 ve	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-2-121213	Client:	Aspect Consulting, LLC
Date Received:	12/13/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/16/13	Lab ID:	312204-02 1/100
Date Analyzed:	12/16/13	Data File:	121621.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	108	50	150
Toluene-d8	96	50	150
4-Bromofluorobenzene	94	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<100	1,3-Dichloropropane	<100
Chloromethane	<1,000	Tetrachloroethene	1,600
Vinyl chloride	<20	Dibromochloromethane	<100
Bromomethane	<100	1,2-Dibromoethane (EDB)	<100
Chloroethane	<100	Chlorobenzene	<100
Trichlorofluoromethane	<100	Ethylbenzene	<100
Acetone	<1,000	1,1,1,2-Tetrachloroethane	<100
1,1-Dichloroethene	<100	m,p-Xylene	<200
Methylene chloride	<500	o-Xylene	<100
Methyl t-butyl ether (MTBE)	<100	Styrene	<100
trans-1,2-Dichloroethene	<100	Isopropylbenzene	<100
1,1-Dichloroethane	<100	Bromoform	<100
2,2-Dichloropropane	<100	n-Propylbenzene	<100
cis-1,2-Dichloroethene	1,200	Bromobenzene	<100
Chloroform	<100	1,3,5-Trimethylbenzene	<100
2-Butanone (MEK)	<1,000	1,1,2,2-Tetrachloroethane	<100
1,2-Dichloroethane (EDC)	<100	1,2,3-Trichloropropane	<100
1,1,1-Trichloroethane	<100	2-Chlorotoluene	<100
1,1-Dichloropropene	<100	4-Chlorotoluene	<100
Carbon tetrachloride	<100	tert-Butylbenzene	<100
Benzene	<35	1,2,4-Trimethylbenzene	<100
Trichloroethene	830	sec-Butylbenzene	<100
1,2-Dichloropropane	<100	p-Isopropyltoluene	<100
Bromodichloromethane	<100	1,3-Dichlorobenzene	<100
Dibromomethane	<100	1,4-Dichlorobenzene	<100
4-Methyl-2-pentanone	<1,000	1,2-Dichlorobenzene	<100
cis-1,3-Dichloropropene	<100	1,2-Dibromo-3-chloropropane	<1,000
Toluene	<100	1,2,4-Trichlorobenzene	<100
trans-1,3-Dichloropropene	<100	Hexachlorobutadiene	<100
1,1,2-Trichloroethane	<100	Naphthalene	<100
2-Hexanone	<1,000	1,2,3-Trichlorobenzene	<100

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/16/13	Lab ID:	03-2525 mb
Date Analyzed:	12/16/13	Data File:	121609.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	50	150
Toluene-d8	97	50	150
4-Bromofluorobenzene	96	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	1.1 lc

Date of Report: 01/06/14
Date Received: 12/13/13
Project: Walker Chevrolet 080190-004-11, F&BI 312204

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

Laboratory Code: 312297-01 (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	79.9	109 b	104 b	50-150	5 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	97	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/06/14
Date Received: 12/13/13
Project: Walker Chevrolet 080190-004-11, F&BI 312204

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

Laboratory Code: 312230-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	112	55-144
Chloromethane	ug/L (ppb)	50	<10	102	67-131
Vinyl chloride	ug/L (ppb)	50	<0.2	99	61-139
Bromomethane	ug/L (ppb)	50	<1	143 vo	66-129
Chloroethane	ug/L (ppb)	50	<1	99	68-126
Trichlorofluoromethane	ug/L (ppb)	50	<1	97	71-128
Acetone	ug/L (ppb)	250	68	101 b	48-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	91	71-123
Methylene chloride	ug/L (ppb)	50	<5	101	61-126
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	102	68-125
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	98	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	100	79-113
2,2-Dichloropropane	ug/L (ppb)	50	<1	105	58-132
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	101	73-119
Chloroform	ug/L (ppb)	50	<1	99	80-112
2-Butanone (MEK)	ug/L (ppb)	250	<10	108	69-123
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	100	78-113
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	97	79-116
1,1-Dichloropropene	ug/L (ppb)	50	<1	94	67-121
Carbon tetrachloride	ug/L (ppb)	50	<1	102	72-123
Benzene	ug/L (ppb)	50	<0.35	96	79-109
Trichloroethene	ug/L (ppb)	50	<1	95	75-109
1,2-Dichloropropane	ug/L (ppb)	50	<1	101	80-111
Bromodichloromethane	ug/L (ppb)	50	<1	105	78-117
Dibromomethane	ug/L (ppb)	50	<1	103	80-112
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	119	79-123
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	109	76-120
Toluene	ug/L (ppb)	50	<1	97	73-117
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	104	75-122
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	99	81-111
2-Hexanone	ug/L (ppb)	250	<10	109	75-126
1,3-Dichloropropane	ug/L (ppb)	50	<1	98	81-111
Tetrachloroethene	ug/L (ppb)	50	<1	91	72-113
Dibromochloromethane	ug/L (ppb)	50	<1	101	69-129
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	100	83-114
Chlorobenzene	ug/L (ppb)	50	<1	98	75-115
Ethylbenzene	ug/L (ppb)	50	<1	92	71-120
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	103	78-122
m,p-Xylene	ug/L (ppb)	100	<2	93	63-128
o-Xylene	ug/L (ppb)	50	<1	95	64-129
Styrene	ug/L (ppb)	50	<1	97	70-122
Isopropylbenzene	ug/L (ppb)	50	<1	96	76-118
Bromoform	ug/L (ppb)	50	<1	106	49-138
n-Propylbenzene	ug/L (ppb)	50	<1	92	74-117
Bromobenzene	ug/L (ppb)	50	<1	94	70-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	93	81-112
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	95	79-120
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	90	72-119
2-Chlorotoluene	ug/L (ppb)	50	<1	88	77-114
4-Chlorotoluene	ug/L (ppb)	50	<1	90	81-109
tert-Butylbenzene	ug/L (ppb)	50	<1	92	81-116
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	94	74-118
sec-Butylbenzene	ug/L (ppb)	50	<1	91	77-118
p-Isopropyltoluene	ug/L (ppb)	50	<1	93	64-132
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	94	81-111
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	93	78-110
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	94	81-111
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	112	69-129
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	101	74-115
Hexachlorobutadiene	ug/L (ppb)	50	<1	97	67-120
Naphthalene	ug/L (ppb)	50	<1	103	63-136
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	103	79-115

Date of Report: 01/06/14
Date Received: 12/13/13
Project: Walker Chevrolet 080190-004-11, F&BI 312204

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)
Dichlorodifluoromethane	ug/L (ppb)	50	120	117	54-149	3
Chloromethane	ug/L (ppb)	50	107	108	67-133	1
Vinyl chloride	ug/L (ppb)	50	101	102	73-132	1
Bromomethane	ug/L (ppb)	50	150 vo	159 vo	69-123	6
Chloroethane	ug/L (ppb)	50	103	104	68-126	1
Trichlorofluoromethane	ug/L (ppb)	50	98	98	70-132	0
Acetone	ug/L (ppb)	250	100	109	44-145	9
1,1-Dichloroethene	ug/L (ppb)	50	91	92	75-119	1
Methylene chloride	ug/L (ppb)	50	105	106	63-132	1
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	107	108	70-122	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	100	99	76-118	1
1,1-Dichloroethane	ug/L (ppb)	50	104	104	80-116	0
2,2-Dichloropropane	ug/L (ppb)	50	111	109	62-141	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	103	103	81-111	0
Chloroform	ug/L (ppb)	50	100	101	81-109	1
2-Butanone (MEK)	ug/L (ppb)	250	105	109	53-140	4
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	102	104	79-109	2
1,1,1-Trichloroethane	ug/L (ppb)	50	100	99	80-116	1
1,1-Dichloropropene	ug/L (ppb)	50	94	94	78-112	0
Carbon tetrachloride	ug/L (ppb)	50	105	104	72-128	1
Benzene	ug/L (ppb)	50	97	98	81-108	1
Trichloroethene	ug/L (ppb)	50	97	96	77-108	1
1,2-Dichloropropane	ug/L (ppb)	50	103	104	82-109	1
Bromodichloromethane	ug/L (ppb)	50	108	108	76-120	0
Dibromomethane	ug/L (ppb)	50	105	106	80-110	1
4-Methyl-2-pentanone	ug/L (ppb)	250	119	121	59-142	2
cis-1,3-Dichloropropene	ug/L (ppb)	50	113	113	76-128	0
Toluene	ug/L (ppb)	50	98	97	83-108	1
trans-1,3-Dichloropropene	ug/L (ppb)	50	110	108	76-128	2
1,1,2-Trichloroethane	ug/L (ppb)	50	103	102	82-110	1
2-Hexanone	ug/L (ppb)	250	102	100	53-145	2
1,3-Dichloropropane	ug/L (ppb)	50	101	99	83-110	2
Tetrachloroethene	ug/L (ppb)	50	90	90	78-109	0
Dibromochloromethane	ug/L (ppb)	50	103	102	63-140	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	101	102	85-113	1
Chlorobenzene	ug/L (ppb)	50	100	98	84-108	2
Ethylbenzene	ug/L (ppb)	50	93	91	84-110	2
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	106	106	76-125	0
m,p-Xylene	ug/L (ppb)	100	94	91	84-112	3
o-Xylene	ug/L (ppb)	50	98	97	82-113	1
Styrene	ug/L (ppb)	50	100	98	84-116	2
Isopropylbenzene	ug/L (ppb)	50	98	97	81-122	1
Bromoform	ug/L (ppb)	50	110	109	40-161	1
n-Propylbenzene	ug/L (ppb)	50	94	92	81-115	2
Bromobenzene	ug/L (ppb)	50	96	94	80-113	2
1,3,5-Trimethylbenzene	ug/L (ppb)	50	96	94	83-117	2
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	95	94	79-118	1
1,2,3-Trichloropropane	ug/L (ppb)	50	91	91	74-116	0
2-Chlorotoluene	ug/L (ppb)	50	90	89	79-112	1
4-Chlorotoluene	ug/L (ppb)	50	91	89	81-113	2
tert-Butylbenzene	ug/L (ppb)	50	95	94	81-119	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	97	96	83-116	1
sec-Butylbenzene	ug/L (ppb)	50	93	91	83-116	2
p-Isopropyltoluene	ug/L (ppb)	50	96	94	82-119	2
1,3-Dichlorobenzene	ug/L (ppb)	50	96	95	83-111	1
1,4-Dichlorobenzene	ug/L (ppb)	50	94	94	82-109	0
1,2-Dichlorobenzene	ug/L (ppb)	50	96	96	83-111	0
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	119	116	62-133	3
1,2,4-Trichlorobenzene	ug/L (ppb)	50	108	107	77-117	1
Hexachlorobutadiene	ug/L (ppb)	50	103	104	74-118	1
Naphthalene	ug/L (ppb)	50	119	120	75-131	1
1,2,3-Trichlorobenzene	ug/L (ppb)	50	117 vo	116 vo	82-115	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.

A1 – More than one compound of similar molecule structure was identified with equal probability.

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 this range fell outside of acceptance criteria. The value reported is an estimate.

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

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

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. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

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

j – The result is below normal reporting limits. 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 analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is 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 compound indicated 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 in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

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.

AQUATIC RESEARCH INCORPORATED
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CASE FILE NUMBER:	**FBI012-32**		**PAGE 1**
REPORT DATE:	**01/02/14**		
DATE SAMPLED:	**12/12/13**	**DATE RECEIVED:**	**12/13/13**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 312204

CASE NARRATIVE

Two water samples were received by the laboratory in good condition and analyzed according to the chain of custody. No difficulties were encountered in the preparation or analysis of these samples. Sample data follows while QA/QC data is contained on subsequent pages.

SAMPLE DATA

SAMPLE ID	NO3+NO2 (mg/L)	SULFATE (mg/L)	TOC (mg/L)
MW-18-121213	0.681	17.8	0.639
MW-2-121213	0.959	9.26	<0.250

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CASE FILE NUMBER:	**FBI012-32**		**PAGE 3**
REPORT DATE:	**01/02/14**		
DATE SAMPLED:	**12/12/13**	**DATE RECEIVED:**	**12/13/13**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 312204

QA/QC DATA

QC PARAMETER	NO3+NO2 (mg/L)	SULFATE (mg/L)	TOC (mg/L)
METHOD	SM184500N03F	SM184500SO4E	SM205310B
DATE ANALYZED	12/13/13	12/27/13	12/29/13
DETECTION LIMIT	0.010	1.00	0.250
DUPLICATE			
SAMPLE ID	BATCH	BATCH	BATCH
ORIGINAL	0.568	17.0	0.942
DUPLICATE	0.567	17.4	0.997
RPD	0.22%	1.98%	5.70%
SPIKE SAMPLE			
SAMPLE ID	BATCH	BATCH	BATCH
ORIGINAL	0.568	17.0	0.942
SPIKED SAMPLE	0.776	27.7	5.59
SPIKE ADDED	0.200	10.0	4.50
% RECOVERY	104.31%	106.51%	103.22%
QC CHECK			
FOUND	0.414	10.2	4.00
TRUE	0.408	10.0	4.00
% RECOVERY	101.54%	101.92%	100.10%
BLANK	<0.010	<1.00	<0.250

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

SUBMITTED BY:

Damien Gadomski
Project Manager

FBI012-32

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 Aa. Research.

PROJECT NAME/NO. 312204 | PO # C-675

REMARKS

Please Email Results

Page # 1 of 1

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	Dioxins and Furans by 8290	EPH	VPH	Nitrate/Nitrate	Sulfate	TOC ~~Alkalinity~~					Notes
MW-18-121213		12/12/13	1155	water					X	X	X					pres. TOC 12/13/13 SB
MW-2-121213		↓	1345	↓					X	X	X					pres. TOC 12/13/13 TAM

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: [signature]	Michael Erdahl	Friedman & Bruya	12/13/13	10:23
Received by: [signature]	Tom Meadows	ART	12/13/13	1525
Relinquished by:				
Received by:				

312204

SAMPLE CHAIN OF CUSTODY ME 12-13-13 AI4/V2

Page # 1 of 1

Send Report To Alan Noell
Company Aspect Consulting
Address 401 2nd Ave S, Ste. 201
City, State, ZIP Seattle, WA 98104
Phone # 206-328-7443 Fax # 206-838-5853

SAMPLERS (signature)

PROJECT NAME/NO.	PO#
Walker Chevrolet	080190-004-11

REMARKS

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	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	volatiles (8260)	NO3, NO2, SO4 (300)	TOC (415.1)	Fe-total (200.8)			Notes
MW-18-121213	01 A-G	12/12/13	11:55	water	7							X	X	X	X			
MW-2-121213	02 T	12/12/13	13:45	water	7							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:		Judy Oleson	Aspect	12/13/13	10:23
Received by:			F&BI	11	12:50
Relinquished by:					
Received by:			Samples received at	2 °C	

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

January 6, 2014

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on December 13, 2013 from the Walker Chevrolet 080190-004-11, F&BI 312227 project. There are 13 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: data@aspectconsulting.com, Parker Wittman
ASP0106R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 13, 2013 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Walker Chevrolet 080190-004-11, F&BI 312227 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
312227 -01	MW-17-121313
312227 -02	MW-16-121313

The samples were sent to Aquatic Research for nitrate, nitrite, sulfate, and total organic carbon analyses. Review of the enclosed report indicates that all quality assurance were acceptable.

Chloroform was detected in the 8260C analysis. The data were flagged as due to possible laboratory contamination.

Bromomethane in the 8260C matrix spike, laboratory control sample and laboratory control sample duplicate exceeded the acceptance criteria. The analyte was not detected in the sample, therefore the data were acceptable.

All other quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-17-121313	Client:	Aspect Consulting, LLC
Date Received:	12/13/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/20/13	Lab ID:	312227-01 x10
Date Analyzed:	12/20/13	Data File:	312227-01 x10.074
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	113	60	125

Analyte:	Concentration ug/L (ppb)
Iron	32,800

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-16-121313	Client:	Aspect Consulting, LLC
Date Received:	12/13/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/20/13	Lab ID:	312227-02
Date Analyzed:	12/20/13	Data File:	312227-02.063
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	104	60	125

Analyte:	Concentration ug/L (ppb)
Iron	4,130

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/20/13	Lab ID:	I3-867 mb
Date Analyzed:	12/20/13	Data File:	I3-867 mb.049
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	99	60	125

Analyte:	Concentration ug/L (ppb)
Iron	<10

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-17-121313	Client:	Aspect Consulting, LLC
Date Received:	12/13/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/16/13	Lab ID:	312227-01
Date Analyzed:	12/16/13	Data File:	121611.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	108	50	150
Toluene-d8	97	50	150
4-Bromofluorobenzene	93	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	170 ve
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	81	Bromobenzene	<1
Chloroform	2.4 lc	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	3.0	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	24	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-17-121313	Client:	Aspect Consulting, LLC
Date Received:	12/13/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/16/13	Lab ID:	312227-01 1/10
Date Analyzed:	12/16/13	Data File:	121618.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	108	50	150
Toluene-d8	97	50	150
4-Bromofluorobenzene	95	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	1,3-Dichloropropane	<10
Chloromethane	<100	Tetrachloroethene	170
Vinyl chloride	<2	Dibromochloromethane	<10
Bromomethane	<10	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	<10
Acetone	<100	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	<20
Methylene chloride	<50	o-Xylene	<10
Methyl t-butyl ether (MTBE)	<10	Styrene	<10
trans-1,2-Dichloroethene	<10	Isopropylbenzene	<10
1,1-Dichloroethane	<10	Bromoform	<10
2,2-Dichloropropane	<10	n-Propylbenzene	<10
cis-1,2-Dichloroethene	77	Bromobenzene	<10
Chloroform	<10	1,3,5-Trimethylbenzene	<10
2-Butanone (MEK)	<100	1,1,2,2-Tetrachloroethane	<10
1,2-Dichloroethane (EDC)	<10	1,2,3-Trichloropropane	<10
1,1,1-Trichloroethane	<10	2-Chlorotoluene	<10
1,1-Dichloropropene	<10	4-Chlorotoluene	<10
Carbon tetrachloride	<10	tert-Butylbenzene	<10
Benzene	<3.5	1,2,4-Trimethylbenzene	<10
Trichloroethene	25	sec-Butylbenzene	<10
1,2-Dichloropropane	<10	p-Isopropyltoluene	<10
Bromodichloromethane	<10	1,3-Dichlorobenzene	<10
Dibromomethane	<10	1,4-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dichlorobenzene	<10
cis-1,3-Dichloropropene	<10	1,2-Dibromo-3-chloropropane	<100
Toluene	<10	1,2,4-Trichlorobenzene	<10
trans-1,3-Dichloropropene	<10	Hexachlorobutadiene	<10
1,1,2-Trichloroethane	<10	Naphthalene	<10
2-Hexanone	<100	1,2,3-Trichlorobenzene	<10

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-16-121313	Client:	Aspect Consulting, LLC
Date Received:	12/13/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/16/13	Lab ID:	312227-02
Date Analyzed:	12/16/13	Data File:	121612.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	50	150
Toluene-d8	96	50	150
4-Bromofluorobenzene	94	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	490 ve
Vinyl chloride	0.49	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	350 ve	Bromobenzene	<1
Chloroform	2.5 lc	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	2.2	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	98	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-16-121313	Client:	Aspect Consulting, LLC
Date Received:	12/13/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/16/13	Lab ID:	312227-02 1/10
Date Analyzed:	12/16/13	Data File:	121619.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	50	150
Toluene-d8	99	50	150
4-Bromofluorobenzene	95	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	1,3-Dichloropropane	<10
Chloromethane	<100	Tetrachloroethene	450
Vinyl chloride	<2	Dibromochloromethane	<10
Bromomethane	<10	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	<10
Acetone	<100	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	<20
Methylene chloride	<50	o-Xylene	<10
Methyl t-butyl ether (MTBE)	<10	Styrene	<10
trans-1,2-Dichloroethene	<10	Isopropylbenzene	<10
1,1-Dichloroethane	<10	Bromoform	<10
2,2-Dichloropropane	<10	n-Propylbenzene	<10
cis-1,2-Dichloroethene	360	Bromobenzene	<10
Chloroform	<10	1,3,5-Trimethylbenzene	<10
2-Butanone (MEK)	<100	1,1,2,2-Tetrachloroethane	<10
1,2-Dichloroethane (EDC)	<10	1,2,3-Trichloropropane	<10
1,1,1-Trichloroethane	<10	2-Chlorotoluene	<10
1,1-Dichloropropene	<10	4-Chlorotoluene	<10
Carbon tetrachloride	<10	tert-Butylbenzene	<10
Benzene	<3.5	1,2,4-Trimethylbenzene	<10
Trichloroethene	99	sec-Butylbenzene	<10
1,2-Dichloropropane	<10	p-Isopropyltoluene	<10
Bromodichloromethane	<10	1,3-Dichlorobenzene	<10
Dibromomethane	<10	1,4-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dichlorobenzene	<10
cis-1,3-Dichloropropene	<10	1,2-Dibromo-3-chloropropane	<100
Toluene	<10	1,2,4-Trichlorobenzene	<10
trans-1,3-Dichloropropene	<10	Hexachlorobutadiene	<10
1,1,2-Trichloroethane	<10	Naphthalene	<10
2-Hexanone	<100	1,2,3-Trichlorobenzene	<10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/16/13	Lab ID:	03-2525 mb
Date Analyzed:	12/16/13	Data File:	121609.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	50	150
Toluene-d8	97	50	150
4-Bromofluorobenzene	96	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	1.1 jl

Date of Report: 01/06/14
Date Received: 12/13/13
Project: Walker Chevrolet 080190-004-11, F&BI 312227

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

Laboratory Code: 312297-01 (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	79.9	109 b	104 b	50-150	5 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	97	70-130

Date of Report: 01/06/14
Date Received: 12/13/13
Project: Walker Chevrolet 080190-004-11, F&BI 312227

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

Laboratory Code: 312230-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	112	55-144
Chloromethane	ug/L (ppb)	50	<10	102	67-131
Vinyl chloride	ug/L (ppb)	50	<0.2	99	61-139
Bromomethane	ug/L (ppb)	50	<1	143 vo	66-129
Chloroethane	ug/L (ppb)	50	<1	99	68-126
Trichlorofluoromethane	ug/L (ppb)	50	<1	97	71-128
Acetone	ug/L (ppb)	250	68	101 b	48-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	91	71-123
Methylene chloride	ug/L (ppb)	50	<5	101	61-126
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	102	68-125
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	98	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	100	79-113
2,2-Dichloropropane	ug/L (ppb)	50	<1	105	58-132
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	101	73-119
Chloroform	ug/L (ppb)	50	<1	99	80-112
2-Butanone (MEK)	ug/L (ppb)	250	<10	108	69-123
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	100	78-113
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	97	79-116
1,1-Dichloropropene	ug/L (ppb)	50	<1	94	67-121
Carbon tetrachloride	ug/L (ppb)	50	<1	102	72-123
Benzene	ug/L (ppb)	50	<0.35	96	79-109
Trichloroethene	ug/L (ppb)	50	<1	95	75-109
1,2-Dichloropropane	ug/L (ppb)	50	<1	101	80-111
Bromodichloromethane	ug/L (ppb)	50	<1	105	78-117
Dibromomethane	ug/L (ppb)	50	<1	103	80-112
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	119	79-123
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	109	76-120
Toluene	ug/L (ppb)	50	<1	97	73-117
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	104	75-122
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	99	81-111
2-Hexanone	ug/L (ppb)	250	<10	109	75-126
1,3-Dichloropropane	ug/L (ppb)	50	<1	98	81-111
Tetrachloroethene	ug/L (ppb)	50	<1	91	72-113
Dibromochloromethane	ug/L (ppb)	50	<1	101	69-129
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	100	83-114
Chlorobenzene	ug/L (ppb)	50	<1	98	75-115
Ethylbenzene	ug/L (ppb)	50	<1	92	71-120
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	103	78-122
m,p-Xylene	ug/L (ppb)	100	<2	93	63-128
o-Xylene	ug/L (ppb)	50	<1	95	64-129
Styrene	ug/L (ppb)	50	<1	97	70-122
Isopropylbenzene	ug/L (ppb)	50	<1	96	76-118
Bromoform	ug/L (ppb)	50	<1	106	49-138
n-Propylbenzene	ug/L (ppb)	50	<1	92	74-117
Bromobenzene	ug/L (ppb)	50	<1	94	70-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	93	81-112
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	95	79-120
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	90	72-119
2-Chlorotoluene	ug/L (ppb)	50	<1	88	77-114
4-Chlorotoluene	ug/L (ppb)	50	<1	90	81-109
tert-Butylbenzene	ug/L (ppb)	50	<1	92	81-116
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	94	74-118
sec-Butylbenzene	ug/L (ppb)	50	<1	91	77-118
p-Isopropyltoluene	ug/L (ppb)	50	<1	93	64-132
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	94	81-111
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	93	78-110
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	94	81-111
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	112	69-129
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	101	74-115
Hexachlorobutadiene	ug/L (ppb)	50	<1	97	67-120
Naphthalene	ug/L (ppb)	50	<1	103	63-136
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	103	79-115

Date of Report: 01/06/14
Date Received: 12/13/13
Project: Walker Chevrolet 080190-004-11, F&BI 312227

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)
Dichlorodifluoromethane	ug/L (ppb)	50	120	117	54-149	3
Chloromethane	ug/L (ppb)	50	107	108	67-133	1
Vinyl chloride	ug/L (ppb)	50	101	102	73-132	1
Bromomethane	ug/L (ppb)	50	150 vo	159 vo	69-123	6
Chloroethane	ug/L (ppb)	50	103	104	68-126	1
Trichlorofluoromethane	ug/L (ppb)	50	98	98	70-132	0
Acetone	ug/L (ppb)	250	100	109	44-145	9
1,1-Dichloroethene	ug/L (ppb)	50	91	92	75-119	1
Methylene chloride	ug/L (ppb)	50	105	106	63-132	1
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	107	108	70-122	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	100	99	76-118	1
1,1-Dichloroethane	ug/L (ppb)	50	104	104	80-116	0
2,2-Dichloropropane	ug/L (ppb)	50	111	109	62-141	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	103	103	81-111	0
Chloroform	ug/L (ppb)	50	100	101	81-109	1
2-Butanone (MEK)	ug/L (ppb)	250	105	109	53-140	4
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	102	104	79-109	2
1,1,1-Trichloroethane	ug/L (ppb)	50	100	99	80-116	1
1,1-Dichloropropene	ug/L (ppb)	50	94	94	78-112	0
Carbon tetrachloride	ug/L (ppb)	50	105	104	72-128	1
Benzene	ug/L (ppb)	50	97	98	81-108	1
Trichloroethene	ug/L (ppb)	50	97	96	77-108	1
1,2-Dichloropropane	ug/L (ppb)	50	103	104	82-109	1
Bromodichloromethane	ug/L (ppb)	50	108	108	76-120	0
Dibromomethane	ug/L (ppb)	50	105	106	80-110	1
4-Methyl-2-pentanone	ug/L (ppb)	250	119	121	59-142	2
cis-1,3-Dichloropropene	ug/L (ppb)	50	113	113	76-128	0
Toluene	ug/L (ppb)	50	98	97	83-108	1
trans-1,3-Dichloropropene	ug/L (ppb)	50	110	108	76-128	2
1,1,2-Trichloroethane	ug/L (ppb)	50	103	102	82-110	1
2-Hexanone	ug/L (ppb)	250	102	100	53-145	2
1,3-Dichloropropane	ug/L (ppb)	50	101	99	83-110	2
Tetrachloroethene	ug/L (ppb)	50	90	90	78-109	0
Dibromochloromethane	ug/L (ppb)	50	103	102	63-140	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	101	102	85-113	1
Chlorobenzene	ug/L (ppb)	50	100	98	84-108	2
Ethylbenzene	ug/L (ppb)	50	93	91	84-110	2
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	106	106	76-125	0
m,p-Xylene	ug/L (ppb)	100	94	91	84-112	3
o-Xylene	ug/L (ppb)	50	98	97	82-113	1
Styrene	ug/L (ppb)	50	100	98	84-116	2
Isopropylbenzene	ug/L (ppb)	50	98	97	81-122	1
Bromoform	ug/L (ppb)	50	110	109	40-161	1
n-Propylbenzene	ug/L (ppb)	50	94	92	81-115	2
Bromobenzene	ug/L (ppb)	50	96	94	80-113	2
1,3,5-Trimethylbenzene	ug/L (ppb)	50	96	94	83-117	2
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	95	94	79-118	1
1,2,3-Trichloropropane	ug/L (ppb)	50	91	91	74-116	0
2-Chlorotoluene	ug/L (ppb)	50	90	89	79-112	1
4-Chlorotoluene	ug/L (ppb)	50	91	89	81-113	2
tert-Butylbenzene	ug/L (ppb)	50	95	94	81-119	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	97	96	83-116	1
sec-Butylbenzene	ug/L (ppb)	50	93	91	83-116	2
p-Isopropyltoluene	ug/L (ppb)	50	96	94	82-119	2
1,3-Dichlorobenzene	ug/L (ppb)	50	96	95	83-111	1
1,4-Dichlorobenzene	ug/L (ppb)	50	94	94	82-109	0
1,2-Dichlorobenzene	ug/L (ppb)	50	96	96	83-111	0
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	119	116	62-133	3
1,2,4-Trichlorobenzene	ug/L (ppb)	50	108	107	77-117	1
Hexachlorobutadiene	ug/L (ppb)	50	103	104	74-118	1
Naphthalene	ug/L (ppb)	50	119	120	75-131	1
1,2,3-Trichlorobenzene	ug/L (ppb)	50	117 vo	116 vo	82-115	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.

A1 – More than one compound of similar molecule structure was identified with equal probability.

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 this range fell outside of acceptance criteria. The value reported is an estimate.

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

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

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. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

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

j – The result is below normal reporting limits. 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 analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is 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 compound indicated 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 in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

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.

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**FBI012-33**		**PAGE 1**
REPORT DATE:	**01/02/14**		
DATE SAMPLED:	**12/13/13**	**DATE RECEIVED:**	**12/16/13**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 312227

CASE NARRATIVE

Two water samples were received by the laboratory in good condition and analyzed according to the chain of custody. No difficulties were encountered in the preparation or analysis of these samples. Sample data follows while QA/QC data is contained on subsequent pages.

SAMPLE DATA

SAMPLE ID	NITRATE (mg/L)	NITRITE (mg/L)	SULFATE (mg/L)	TOC (mg/L)
MW-17-121313	1.51	0.004	14.9	<0.250
MW-16-121313	1.76	0.004	17.0	<0.250

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

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FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 312227

QA/QC DATA

QC PARAMETER	NITRATE (mg/L)	NITRITE (mg/L)	SULFATE (mg/L)	TOC (mg/L)
METHOD	SM184500N03F	EPA 353.2	SM184500SO4E	SM205310B
DATE ANALYZED	12/18/13	12/16/13	12/27/13	12/29/13
DETECTION LIMIT	0.010	0.002	1.00	0.250
DUPLICATE				
SAMPLE ID	BATCH	MW-16-121313	MW-16-121313	BATCH
ORIGINAL	0.054	0.004	17.0	0.942
DUPLICATE	0.052	0.004	17.4	0.997
RPD	4.08%	0.00%	1.98%	5.70%
SPIKE SAMPLE				
SAMPLE ID	BATCH	MW-16-121313	MW-16-121313	BATCH
ORIGINAL	0.054	0.004	17.0	0.942
SPIKED SAMPLE	0.257	0.044	27.7	5.59
SPIKE ADDED	0.200	0.040	10.0	4.50
% RECOVERY	101.46%	100.00%	106.51%	103.22%
QC CHECK				
FOUND	0.401	0.040	10.2	4.00
TRUE	0.408	0.040	10.0	4.00
% RECOVERY	98.33%	100.00%	101.92%	100.10%
BLANK	<0.010	<0.002	<1.00	<0.250

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

SUBMITTED BY:

Damien Gadomski

Damien Gadomski
Project Manager

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

FB1012-33

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 Ag. Research

PROJECT NAME/NO.	PO #
312227	C-675

REMARKS

Please Email Results

Page # 1 of 1

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	Dioxins and Furans by 8290	EPH	VPH	Nitrate	Sulfate	Nitrite ~~Alkalinity~~	TOC				Notes
MW-17-121313		12/13/13	1330	water	2				X	X	X	X				
MW-16-121313		↓	1450	↓	2				X	X	X	X				Please run Nitrate/Nitrite Today — MF

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 & Bruya	12/15/13	11:10
Received by:	MARIE HENDRICKSON	ARI	12/16/13	1:30
Relinquished by:				
Received by:				

312227

SAMPLE CHAIN OF CUSTODY ME ~~12-16-13~~ 12-13-13

AI2/V2

Page # 1 of 1

Send Report To Alan Noell

Company Aspect Consulting

Address 401 2nd Ave S. Ste. 201

City, State, ZIP Seattle, WA 98104

Phone # 206-328-7443 Fax # 206-838-5853

SAMPLERS (*signature*)

PROJECT NAME/NO. Walker Chevrolet

PO# 080190-004-1

REMARKS

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	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Volatiles (8260)	NO3, NO2, SO4 (300)	TOC (415.1)	Fe-total (200.8)			Notes
MW-17-121313	01A-G	12/13/13	13:30	Water	7							X	X	X	X			
MW-16-12133	02T	12/13/13	14:50	Water	7							X	X	X	X			

Samples received at 6 °C

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:		Judy Oleson	Aspect	12/13/13	18:30
Received by:		Kurt Johnson	FBB	12/13/13	18:30
Relinquished by:					
Received by:					

Samples received at ____ °C

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

January 7, 2014

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on December 18, 2013 from the Walker Chevrolet 080190-004-11, F&BI 312298 project. There are 15 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: data@aspectconsulting.com, Parker Wittman
ASP0107R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 18, 2013 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Walker Chevrolet 080190-004-11, F&BI 312298 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
312298 -01	MW-13D-121613
312298 -02	MW-8-121713
312298 -03	MW-15-121713
312298 -04	MW-15-121713-DUP
312298 -05	MW-21-121713

Samples MW-8-121713, MW-15-121713, and MW-21-121713 were sent to Aquatic Research for nitrate, nitrite, sulfate, and total organic carbon analyses. Review of the enclosed report indicates that all quality assurance were acceptable.

Several compounds in the 8260C matrix spike, laboratory control sample and laboratory control sample duplicate exceeded the acceptance criteria. The analytes were not detected in the sample, therefore the data were acceptable.

All other quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-8-121713	Client:	Aspect Consulting, LLC
Date Received:	12/18/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/27/13	Lab ID:	312298-02 x10
Date Analyzed:	12/30/13	Data File:	312298-02 x10.025
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	101	60	125

Analyte:	Concentration ug/L (ppb)
Iron	77,300

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-15-121713	Client:	Aspect Consulting, LLC
Date Received:	12/18/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/27/13	Lab ID:	312298-03
Date Analyzed:	12/30/13	Data File:	312298-03.014
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	91	60	125

Analyte:	Concentration ug/L (ppb)
Iron	968

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-21-121713	Client:	Aspect Consulting, LLC
Date Received:	12/18/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/27/13	Lab ID:	312298-05 x10
Date Analyzed:	12/30/13	Data File:	312298-05 x10.026
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	106	60	125

Analyte:	Concentration ug/L (ppb)
Iron	79,100

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/27/13	Lab ID:	I3-877 mb
Date Analyzed:	12/30/13	Data File:	I3-877 mb.008
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	83	60	125

Analyte:	Concentration ug/L (ppb)
Iron	<10

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-13D-121613	Client:	Aspect Consulting, LLC
Date Received:	12/18/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/20/13	Lab ID:	312298-01
Date Analyzed:	12/20/13	Data File:	122025.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	50	150
Toluene-d8	97	50	150
4-Bromofluorobenzene	96	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	Tetrachloroethene	5.9
Chloromethane	<10	Dibromochloromethane	<1
Vinyl chloride	<0.2	1,2-Dibromoethane (EDB)	<1
Bromomethane	<1	Chlorobenzene	<1
Chloroethane	<1	Ethylbenzene	<1
Trichlorofluoromethane	<1	1,1,1,2-Tetrachloroethane	<1
Acetone	<10	m,p-Xylene	<2
1,1-Dichloroethene	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	32	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon Tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	3.7	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1
1,3-Dichloropropane	<1		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-8-121713	Client:	Aspect Consulting, LLC
Date Received:	12/18/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/20/13	Lab ID:	312298-02 1/50
Date Analyzed:	12/20/13	Data File:	122029.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	50	150
Toluene-d8	98	50	150
4-Bromofluorobenzene	95	50	150

Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<50
Chloromethane	<500
Vinyl chloride	<10
Bromomethane	<50
Chloroethane	<50
Trichlorofluoromethane	<50
Acetone	<500
1,1-Dichloroethene	<50
Methylene chloride	<250
trans-1,2-Dichloroethene	<50
1,1-Dichloroethane	<50
2,2-Dichloropropane	<50
cis-1,2-Dichloroethene	1,300
Chloroform	<50
2-Butanone (MEK)	<500
1,2-Dichloroethane (EDC)	<50
1,1,1-Trichloroethane	<50
1,1-Dichloropropene	<50
Carbon Tetrachloride	<50
Benzene	<17
Trichloroethene	560
1,2-Dichloropropane	<50
Bromodichloromethane	<50
Dibromomethane	<50
4-Methyl-2-pentanone	<500
cis-1,3-Dichloropropene	<50
Toluene	<50
trans-1,3-Dichloropropene	<50
1,1,2-Trichloroethane	<50
2-Hexanone	<500
1,3-Dichloropropane	<50
Tetrachloroethene	940
Dibromochloromethane	<50
1,2-Dibromoethane (EDB)	<50
Chlorobenzene	<50
Ethylbenzene	<50
1,1,1,2-Tetrachloroethane	<50
m,p-Xylene	<100
o-Xylene	<50
Styrene	<50
Isopropylbenzene	<50
Bromoform	<50
n-Propylbenzene	<50
Bromobenzene	<50
1,3,5-Trimethylbenzene	<50
1,1,2,2-Tetrachloroethane	<50
1,2,3-Trichloropropane	<50
2-Chlorotoluene	<50
4-Chlorotoluene	<50
tert-Butylbenzene	<50
1,2,4-Trimethylbenzene	<50
sec-Butylbenzene	<50
p-Isopropyltoluene	<50
1,3-Dichlorobenzene	<50
1,4-Dichlorobenzene	<50
1,2-Dichlorobenzene	<50
1,2-Dibromo-3-chloropropane	<500
1,2,4-Trichlorobenzene	<50
Hexachlorobutadiene	<50
Naphthalene	<50
1,2,3-Trichlorobenzene	<50

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-15-121713	Client:	Aspect Consulting, LLC
Date Received:	12/18/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/20/13	Lab ID:	312298-03 1/10
Date Analyzed:	12/20/13	Data File:	122026.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	50	150
Toluene-d8	99	50	150
4-Bromofluorobenzene	93	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	Tetrachloroethene	460
Chloromethane	<100	Dibromochloromethane	<10
Vinyl chloride	<2	1,2-Dibromoethane (EDB)	<10
Bromomethane	<10	Chlorobenzene	<10
Chloroethane	<10	Ethylbenzene	<10
Trichlorofluoromethane	<10	1,1,1,2-Tetrachloroethane	<10
Acetone	<100	m,p-Xylene	<20
1,1-Dichloroethene	<10	o-Xylene	<10
Methylene chloride	<50	Styrene	<10
trans-1,2-Dichloroethene	<10	Isopropylbenzene	<10
1,1-Dichloroethane	<10	Bromoform	<10
2,2-Dichloropropane	<10	n-Propylbenzene	<10
cis-1,2-Dichloroethene	380	Bromobenzene	<10
Chloroform	<10	1,3,5-Trimethylbenzene	<10
2-Butanone (MEK)	<100	1,1,2,2-Tetrachloroethane	<10
1,2-Dichloroethane (EDC)	<10	1,2,3-Trichloropropane	<10
1,1,1-Trichloroethane	<10	2-Chlorotoluene	<10
1,1-Dichloropropene	<10	4-Chlorotoluene	<10
Carbon Tetrachloride	<10	tert-Butylbenzene	<10
Benzene	<3.5	1,2,4-Trimethylbenzene	<10
Trichloroethene	110	sec-Butylbenzene	<10
1,2-Dichloropropane	<10	p-Isopropyltoluene	<10
Bromodichloromethane	<10	1,3-Dichlorobenzene	<10
Dibromomethane	<10	1,4-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dichlorobenzene	<10
cis-1,3-Dichloropropene	<10	1,2-Dibromo-3-chloropropane	<100
Toluene	<10	1,2,4-Trichlorobenzene	<10
trans-1,3-Dichloropropene	<10	Hexachlorobutadiene	<10
1,1,2-Trichloroethane	<10	Naphthalene	<10
2-Hexanone	<100	1,2,3-Trichlorobenzene	<10
1,3-Dichloropropane	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-15-121713-DUP	Client:	Aspect Consulting, LLC
Date Received:	12/18/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/20/13	Lab ID:	312298-04 1/10
Date Analyzed:	12/20/13	Data File:	122027.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	50	150
Toluene-d8	99	50	150
4-Bromofluorobenzene	98	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	Tetrachloroethene	480
Chloromethane	<100	Dibromochloromethane	<10
Vinyl chloride	<2	1,2-Dibromoethane (EDB)	<10
Bromomethane	<10	Chlorobenzene	<10
Chloroethane	<10	Ethylbenzene	<10
Trichlorofluoromethane	<10	1,1,1,2-Tetrachloroethane	<10
Acetone	<100	m,p-Xylene	<20
1,1-Dichloroethene	<10	o-Xylene	<10
Methylene chloride	<50	Styrene	<10
trans-1,2-Dichloroethene	<10	Isopropylbenzene	<10
1,1-Dichloroethane	<10	Bromoform	<10
2,2-Dichloropropane	<10	n-Propylbenzene	<10
cis-1,2-Dichloroethene	370	Bromobenzene	<10
Chloroform	<10	1,3,5-Trimethylbenzene	<10
2-Butanone (MEK)	<100	1,1,2,2-Tetrachloroethane	<10
1,2-Dichloroethane (EDC)	<10	1,2,3-Trichloropropane	<10
1,1,1-Trichloroethane	<10	2-Chlorotoluene	<10
1,1-Dichloropropene	<10	4-Chlorotoluene	<10
Carbon Tetrachloride	<10	tert-Butylbenzene	<10
Benzene	<3.5	1,2,4-Trimethylbenzene	<10
Trichloroethene	110	sec-Butylbenzene	<10
1,2-Dichloropropane	<10	p-Isopropyltoluene	<10
Bromodichloromethane	<10	1,3-Dichlorobenzene	<10
Dibromomethane	<10	1,4-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dichlorobenzene	<10
cis-1,3-Dichloropropene	<10	1,2-Dibromo-3-chloropropane	<100
Toluene	<10	1,2,4-Trichlorobenzene	<10
trans-1,3-Dichloropropene	<10	Hexachlorobutadiene	<10
1,1,2-Trichloroethane	<10	Naphthalene	<10
2-Hexanone	<100	1,2,3-Trichlorobenzene	<10
1,3-Dichloropropane	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-21-121713	Client:	Aspect Consulting, LLC
Date Received:	12/18/13	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/20/13	Lab ID:	312298-05 1/10
Date Analyzed:	12/20/13	Data File:	122028.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	50	150
Toluene-d8	99	50	150
4-Bromofluorobenzene	97	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	Tetrachloroethene	500
Chloromethane	<100	Dibromochloromethane	<10
Vinyl chloride	<2	1,2-Dibromoethane (EDB)	<10
Bromomethane	<10	Chlorobenzene	<10
Chloroethane	<10	Ethylbenzene	<10
Trichlorofluoromethane	<10	1,1,1,2-Tetrachloroethane	<10
Acetone	<100	m,p-Xylene	<20
1,1-Dichloroethene	<10	o-Xylene	<10
Methylene chloride	<50	Styrene	<10
trans-1,2-Dichloroethene	<10	Isopropylbenzene	<10
1,1-Dichloroethane	<10	Bromoform	<10
2,2-Dichloropropane	<10	n-Propylbenzene	<10
cis-1,2-Dichloroethene	460	Bromobenzene	<10
Chloroform	<10	1,3,5-Trimethylbenzene	<10
2-Butanone (MEK)	<100	1,1,2,2-Tetrachloroethane	<10
1,2-Dichloroethane (EDC)	<10	1,2,3-Trichloropropane	<10
1,1,1-Trichloroethane	<10	2-Chlorotoluene	<10
1,1-Dichloropropene	<10	4-Chlorotoluene	<10
Carbon Tetrachloride	<10	tert-Butylbenzene	<10
Benzene	<3.5	1,2,4-Trimethylbenzene	<10
Trichloroethene	130	sec-Butylbenzene	<10
1,2-Dichloropropane	<10	p-Isopropyltoluene	<10
Bromodichloromethane	<10	1,3-Dichlorobenzene	<10
Dibromomethane	<10	1,4-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dichlorobenzene	<10
cis-1,3-Dichloropropene	<10	1,2-Dibromo-3-chloropropane	<100
Toluene	<10	1,2,4-Trichlorobenzene	<10
trans-1,3-Dichloropropene	<10	Hexachlorobutadiene	<10
1,1,2-Trichloroethane	<10	Naphthalene	<10
2-Hexanone	<100	1,2,3-Trichlorobenzene	<10
1,3-Dichloropropane	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Walker Chevrolet 080190-004-11
Date Extracted:	12/20/13	Lab ID:	03-2609 mb
Date Analyzed:	12/20/13	Data File:	122019.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	50	150
Toluene-d8	98	50	150
4-Bromofluorobenzene	97	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	Tetrachloroethene	<1
Chloromethane	<10	Dibromochloromethane	<1
Vinyl chloride	<0.2	1,2-Dibromoethane (EDB)	<1
Bromomethane	<1	Chlorobenzene	<1
Chloroethane	<1	Ethylbenzene	<1
Trichlorofluoromethane	<1	1,1,1,2-Tetrachloroethane	<1
Acetone	<10	m,p-Xylene	<2
1,1-Dichloroethene	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon Tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1
1,3-Dichloropropane	<1		

Date of Report: 01/07/14
Date Received: 12/18/13
Project: Walker Chevrolet 080190-004-11, F&BI 312298

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

Laboratory Code: 312390-01 (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	269	115 b	121 b	50-150	5 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	108	70-130

Date of Report: 01/07/14
Date Received: 12/18/13
Project: Walker Chevrolet 080190-004-11, F&BI 312298

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

Laboratory Code: 312298-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	94	55-144
Chloromethane	ug/L (ppb)	50	<10	87	67-131
Vinyl chloride	ug/L (ppb)	50	<0.2	99	61-139
Bromomethane	ug/L (ppb)	50	<1	135 vo	66-129
Chloroethane	ug/L (ppb)	50	<1	95	68-126
Trichlorofluoromethane	ug/L (ppb)	50	<1	96	71-128
Acetone	ug/L (ppb)	250	<10	93	48-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	90	71-123
Methylene chloride	ug/L (ppb)	50	<5	94	61-126
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	94	68-125
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	94	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	95	79-113
2,2-Dichloropropane	ug/L (ppb)	50	<1	91	58-132
cis-1,2-Dichloroethene	ug/L (ppb)	50	32	93 b	73-119
Chloroform	ug/L (ppb)	50	<1	92	80-112
2-Butanone (MEK)	ug/L (ppb)	250	<10	106	69-123
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	97	78-113
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	97	79-116
1,1-Dichloropropene	ug/L (ppb)	50	<1	94	67-121
Carbon tetrachloride	ug/L (ppb)	50	<1	103	72-123
Benzene	ug/L (ppb)	50	<0.35	93	79-109
Trichloroethene	ug/L (ppb)	50	3.7	94	75-109
1,2-Dichloropropane	ug/L (ppb)	50	<1	98	80-111
Bromodichloromethane	ug/L (ppb)	50	<1	101	78-117
Dibromomethane	ug/L (ppb)	50	<1	101	80-112
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	117	79-123
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	100	76-120
Toluene	ug/L (ppb)	50	<1	96	73-117
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	98	75-122
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	99	81-111
2-Hexanone	ug/L (ppb)	250	<10	108	75-126
1,3-Dichloropropane	ug/L (ppb)	50	<1	98	81-111
Tetrachloroethene	ug/L (ppb)	50	5.9	92	72-113
Dibromochloromethane	ug/L (ppb)	50	<1	92	69-129
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	100	83-114
Chlorobenzene	ug/L (ppb)	50	<1	97	75-115
Ethylbenzene	ug/L (ppb)	50	<1	91	71-120
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	97	78-122
m,p-Xylene	ug/L (ppb)	100	<2	92	63-128
o-Xylene	ug/L (ppb)	50	<1	92	64-129
Styrene	ug/L (ppb)	50	<1	93	70-122
Isopropylbenzene	ug/L (ppb)	50	<1	93	76-118
Bromoform	ug/L (ppb)	50	<1	88	49-138
n-Propylbenzene	ug/L (ppb)	50	<1	94	74-117
Bromobenzene	ug/L (ppb)	50	<1	94	70-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	93	81-112
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	96	79-120
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	90	72-119
2-Chlorotoluene	ug/L (ppb)	50	<1	88	77-114
4-Chlorotoluene	ug/L (ppb)	50	<1	89	81-109
tert-Butylbenzene	ug/L (ppb)	50	<1	93	81-116
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	95	74-118
sec-Butylbenzene	ug/L (ppb)	50	<1	91	77-118
p-Isopropyltoluene	ug/L (ppb)	50	<1	92	64-132
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	92	81-111
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	91	78-110
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	92	81-111
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	109	69-129
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	100	74-115
Hexachlorobutadiene	ug/L (ppb)	50	<1	90	67-120
Naphthalene	ug/L (ppb)	50	<1	107	63-136
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	103	79-115

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/07/14
Date Received: 12/18/13
Project: Walker Chevrolet 080190-004-11, F&BI 312298

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)
Dichlorodifluoromethane	ug/L (ppb)	50	98	97	54-149	1
Chloromethane	ug/L (ppb)	50	92	95	67-133	3
Vinyl chloride	ug/L (ppb)	50	102	104	73-132	2
Bromomethane	ug/L (ppb)	50	121	131 vo	69-123	8
Chloroethane	ug/L (ppb)	50	99	102	68-126	3
Trichlorofluoromethane	ug/L (ppb)	50	99	99	70-132	0
Acetone	ug/L (ppb)	250	105	107	44-145	2
1,1-Dichloroethene	ug/L (ppb)	50	93	92	75-119	1
Methylene chloride	ug/L (ppb)	50	99	102	63-132	3
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	104	105	70-122	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	98	99	76-118	1
1,1-Dichloroethane	ug/L (ppb)	50	102	102	80-116	0
2,2-Dichloropropane	ug/L (ppb)	50	115	118	62-141	3
cis-1,2-Dichloroethene	ug/L (ppb)	50	100	102	81-111	2
Chloroform	ug/L (ppb)	50	99	100	81-109	1
2-Butanone (MEK)	ug/L (ppb)	250	104	106	53-140	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	101	103	79-109	2
1,1,1-Trichloroethane	ug/L (ppb)	50	102	103	80-116	1
1,1-Dichloropropene	ug/L (ppb)	50	97	96	78-112	1
Carbon tetrachloride	ug/L (ppb)	50	110	109	72-128	1
Benzene	ug/L (ppb)	50	97	97	81-108	0
Trichloroethene	ug/L (ppb)	50	97	97	77-108	0
1,2-Dichloropropane	ug/L (ppb)	50	102	103	82-109	1
Bromodichloromethane	ug/L (ppb)	50	102	105	76-120	3
Dibromomethane	ug/L (ppb)	50	102	104	80-110	2
4-Methyl-2-pentanone	ug/L (ppb)	250	118	118	59-142	0
cis-1,3-Dichloropropene	ug/L (ppb)	50	109	111	76-128	2
Toluene	ug/L (ppb)	50	99	99	83-108	0
trans-1,3-Dichloropropene	ug/L (ppb)	50	106	109	76-128	3
1,1,2-Trichloroethane	ug/L (ppb)	50	100	102	82-110	2
2-Hexanone	ug/L (ppb)	250	105	105	53-145	0
1,3-Dichloropropane	ug/L (ppb)	50	99	99	83-110	0
Tetrachloroethene	ug/L (ppb)	50	95	94	78-109	1
Dibromochloromethane	ug/L (ppb)	50	95	97	63-140	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	100	100	85-113	0
Chlorobenzene	ug/L (ppb)	50	99	101	84-108	2
Ethylbenzene	ug/L (ppb)	50	93	93	84-110	0
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	102	105	76-125	3
m,p-Xylene	ug/L (ppb)	100	94	94	84-112	0
o-Xylene	ug/L (ppb)	50	98	99	82-113	1
Styrene	ug/L (ppb)	50	97	99	84-116	2
Isopropylbenzene	ug/L (ppb)	50	98	99	81-122	1
Bromoform	ug/L (ppb)	50	95	96	40-161	1
n-Propylbenzene	ug/L (ppb)	50	97	96	81-115	1
Bromobenzene	ug/L (ppb)	50	96	96	80-113	0
1,3,5-Trimethylbenzene	ug/L (ppb)	50	98	99	83-117	1
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	96	96	79-118	0
1,2,3-Trichloropropane	ug/L (ppb)	50	92	91	74-116	1
2-Chlorotoluene	ug/L (ppb)	50	91	91	79-112	0
4-Chlorotoluene	ug/L (ppb)	50	92	92	81-113	0
tert-Butylbenzene	ug/L (ppb)	50	97	98	81-119	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	99	99	83-116	0
sec-Butylbenzene	ug/L (ppb)	50	95	95	83-116	0
p-Isopropyltoluene	ug/L (ppb)	50	99	99	82-119	0
1,3-Dichlorobenzene	ug/L (ppb)	50	96	98	83-111	2
1,4-Dichlorobenzene	ug/L (ppb)	50	95	96	82-109	1
1,2-Dichlorobenzene	ug/L (ppb)	50	97	98	83-111	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	109	114	62-133	4
1,2,4-Trichlorobenzene	ug/L (ppb)	50	110	114	77-117	4
Hexachlorobutadiene	ug/L (ppb)	50	107	110	74-118	3
Naphthalene	ug/L (ppb)	50	118	122	75-131	3
1,2,3-Trichlorobenzene	ug/L (ppb)	50	116 vo	120 vo	82-115	3

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.

A1 – More than one compound of similar molecule structure was identified with equal probability.

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 this range fell outside of acceptance criteria. The value reported is an estimate.

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

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

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. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

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

j – The result is below normal reporting limits. 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 analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is 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 compound indicated 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 in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

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.

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**FBI012-35**		**PAGE 1**	
REPORT DATE:	**01/07/14**			
DATE SAMPLED:	**12/17/13**	**DATE RECEIVED:**	**12/19/13**	

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 312298

CASE NARRATIVE

Three water samples were received by the laboratory in good condition and analyzed according to the chain of custody. No difficulties were encountered in the preparation or analysis of these samples. Sample data follows while QA/QC data is contained on subsequent pages.

SAMPLE DATA

SAMPLE ID	NITRATE (mg/L)	NITRITE (mg/L)	SULFATE (mg/L)	TOC (mg/L)
MW-8-121713	0.330	0.004	20.9	<0.250
MW-15-121713	2.08	<0.002	15.4	<0.250
MW-21-121713	2.12	0.005	13.9	<0.250

AQUATIC RESEARCH INCORPORATED
LABORATORY & CONSULTING SERVICES
3927 AURORA AVENUE NORTH, SEATTLE, WA 98103
PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER: FBI012-35
REPORT DATE: 01/07/14
DATE SAMPLED: 12/17/13 **DATE RECEIVED:** 12/19/13
FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 312298

QA/QC DATA

QC PARAMETER	NITRATE (mg/L)	NITRITE (mg/L)	SULFATE (mg/L)	TOC (mg/L)
METHOD	SM184500N03F	EPA 353.2	SM184500SO4E	SM205310B
DATE ANALYZED	12/19/13	12/19/13	01/06/14	12/29/13
DETECTION LIMIT	0.010	0.002	1.00	0.250
DUPLICATE				
SAMPLE ID	BATCH	BATCH	BATCH	BATCH
ORIGINAL	0.205	0.005	18.6	0.942
DUPLICATE	0.201	0.005	18.8	0.997
RPD	1.96%	0.00%	0.75%	5.70%
SPIKE SAMPLE				
SAMPLE ID	BATCH	BATCH	BATCH	BATCH
ORIGINAL	0.205	0.005	18.6	0.942
SPIKED SAMPLE	0.400	0.044	29.2	5.59
SPIKE ADDED	0.200	0.040	10.0	4.50
% RECOVERY	97.53%	97.50%	105.59%	103.22%
QC CHECK				
FOUND	0.419	0.041	10.2	4.00
TRUE	0.408	0.040	10.0	4.00
% RECOVERY	102.78%	102.50%	102.12%	100.10%
BLANK	<0.010	<0.002	<1.00	<0.250

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

SUBMITTED BY:

Damien Gadomski

Damien Gadomski
Project Manager

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

FB1012-35

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 Ag. Research.

PROJECT NAME/NO.	PO #
312298	C-678

REMARKS

Please Email Results

Page # 1 of 1

TURNAROUND TIME
- [x] 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	Dioxins and Furans by 8290	EPH	VPH	Nitrate	Sulfate	Alkalinity	Nitrite	TOC			Notes
MW-8-121713		12/17/13	1650	water					X	X		X	X			
MW15-121713		↓	1520	↓					X	X		X	X			
MW-21-121713			1420.						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: [signature]	Michael Erdahl	Friedman & Bruya	12/19/13	11:00 am
Received by: [signature]	M. HENDRICKSON	ARI	12/19/13	12:15
Relinquished by:				
Received by:				

312298 [redacted]

SAMPLE CHAIN OF COSTODY

ME 12/18/13 [redacted] AI3/V2

Page # 1 of 1

Send Report To Alan Noell

Company Aspect Consulting

Address 401 2nd Ave.S, Ste. 201

City, State, ZIP Seattle, WA 98104

Phone # (206) 328-7443 Fax # (206) 838-5853

SAMPLERS (*signature*) [signature]

PROJECT NAME/NO. Walker Chevrolet

PO# 080190-004-11

REMARKS

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	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	volatiles (8260)	NO3, NO2, SO4 (300)	TOC (415.1)	Fe-total (200.8)			Notes
MW-13D-121613	01A-D	12/16/13	15:45	water	4							X						
MW-8-121713	02A-G	12/17/13	16:50	water	7							X	X	X	X			
MW-15-121713	03 T	12/17/13	15:20	water	7							X	X	X	X			
MW-15-121713-DUP	04A-D	12/17/13	15:20	water	4							X						
MW-21-121713	05A-G	12/17/13	14:20	water	7							X	X	X	X			

Samples received at 2 °C

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: [signature]	Judy Oleson	Aspect	12/18/13	15:15
Received by: [signature]	Nhan Phan	FeBI	12/18/13	15:15
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

January 24, 2014

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on January 8, 2014 from the Walker 080190, F&BI 401081 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: data@aspectconsulting.com, Parker Wittman
ASP0124R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 8, 2014 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Walker 080190, F&BI 401081 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
401081 -01	MW-20-010814
401081 -02	MW-19-010814
401081 -03	MW-07-010714

The samples were sent to Aquatic Research for nitrate, nitrite, sulfate, and total organic carbon analyses. Review of the enclosed report indicates that all quality assurance were acceptable.

Dibenz(a,h)anthracene in the 8270D laboratory control sample duplicate failed the acceptance criteria. The data were flagged accordingly.

Several compounds in the 8260C matrix spike, laboratory control sample and laboratory control sample duplicate exceeded the acceptance criteria. The analytes were not detected in the sample, therefore the data were acceptable.

All other quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-20-010814	Client:	Aspect Consulting, LLC
Date Received:	01/08/14	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/15/14	Lab ID:	401081-01 x10
Date Analyzed:	01/15/14	Data File:	401081-01 x10.056
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	97	60	125

Analyte:	Concentration ug/L (ppb)
Iron	40,800

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-19-010814	Client:	Aspect Consulting, LLC
Date Received:	01/08/14	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/15/14	Lab ID:	401081-02 x100
Date Analyzed:	01/15/14	Data File:	401081-02 x100.060
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	98	60	125

Analyte:	Concentration ug/L (ppb)
Iron	113,000

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-07-010714	Client:	Aspect Consulting, LLC
Date Received:	01/08/14	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/15/14	Lab ID:	401081-03
Date Analyzed:	01/15/14	Data File:	401081-03.050
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	99	60	125
Holmium	81	60	125

Analyte:	Concentration ug/L (ppb)
Lead	3.53
Iron	14,300 ve

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-07-010714	Client:	Aspect Consulting, LLC
Date Received:	01/08/14	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/15/14	Lab ID:	401081-03 x10
Date Analyzed:	01/15/14	Data File:	401081-03 x10.058
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	85	60	125
Holmium	81	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<10
Iron	14,500

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/15/14	Lab ID:	I4-026 mb
Date Analyzed:	01/15/14	Data File:	I4-026 mb.047
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	104	60	125
Holmium	101	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1
Iron	<20

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-20-010814	Client:	Aspect Consulting, LLC
Date Received:	01/08/14	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/09/14	Lab ID:	401081-01
Date Analyzed:	01/09/14	Data File:	010928.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	93	50	150
Toluene-d8	97	50	150
4-Bromofluorobenzene	102	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	140
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	43	Bromobenzene	<1
Chloroform	2.2	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	3.6	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	16	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-19-010814	Client:	Aspect Consulting, LLC
Date Received:	01/08/14	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/09/14	Lab ID:	401081-02
Date Analyzed:	01/09/14	Data File:	010929.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	50	150
Toluene-d8	99	50	150
4-Bromofluorobenzene	102	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	62
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	20	Bromobenzene	<1
Chloroform	3.8	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	7.0	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	4.8	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-07-010714	Client:	Aspect Consulting, LLC
Date Received:	01/08/14	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/09/14	Lab ID:	401081-03
Date Analyzed:	01/09/14	Data File:	010930.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	50	150
Toluene-d8	101	50	150
4-Bromofluorobenzene	105	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	1.4
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	1.6	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/09/14	Lab ID:	04-0040 mb
Date Analyzed:	01/09/14	Data File:	010926.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	50	150
Toluene-d8	101	50	150
4-Bromofluorobenzene	102	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-07-010714	Client:	Aspect Consulting, LLC
Date Received:	01/08/14	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/10/14	Lab ID:	401081-03 1/2
Date Analyzed:	01/13/14	Data File:	011308.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	50	150
Benzo(a)anthracene-d12	86	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1 jl
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/10/14	Lab ID:	04-090 mb
Date Analyzed:	01/10/14	Data File:	011007.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	50	150
Benzo(a)anthracene-d12	87	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1 jl
Benzo(g,h,i)perylene	<0.1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	MW-07-010714	Client:	Aspect Consulting, LLC
Date Received:	01/08/14	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/13/14	Lab ID:	401081-03
Date Analyzed:	01/14/14	Data File:	10.D\ ECD1A.CH
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	67	50	150

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Walker 080190, F&BI 401081
Date Extracted:	01/13/14	Lab ID:	04-100 mb
Date Analyzed:	01/14/14	Data File:	08.D\ ECD1A.CH
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	mcp

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	69	50	150

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1

Date of Report: 01/24/14
Date Received: 01/08/14
Project: Walker 080190, F&BI 401081

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

Laboratory Code: 401081-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	3.53	106 b	100 b	79-121	6 b
Iron	ug/L (ppb)	100	14,300	0 b	0 b	50-150	0 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	107	83-115
Iron	ug/L (ppb)	100	115	70-130

Date of Report: 01/24/14
Date Received: 01/08/14
Project: Walker 080190, F&BI 401081

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

Laboratory Code: 401071-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	110	92 b	55-144
Chloromethane	ug/L (ppb)	50	<10	92	67-131
Vinyl chloride	ug/L (ppb)	50	<0.2	97	61-139
Bromomethane	ug/L (ppb)	50	<1	195 vo	66-129
Chloroethane	ug/L (ppb)	50	<1	90	68-126
Trichlorofluoromethane	ug/L (ppb)	50	580	96 b	71-128
Acetone	ug/L (ppb)	250	<10	84	48-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	100	71-123
Methylene chloride	ug/L (ppb)	50	<5	78	61-126
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	91	68-125
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	99	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	96	79-113
2,2-Dichloropropane	ug/L (ppb)	50	<1	95	58-132
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	94	73-119
Chloroform	ug/L (ppb)	50	<1	98	80-112
2-Butanone (MEK)	ug/L (ppb)	250	<10	92	69-123
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	94	78-113
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	108	79-116
1,1-Dichloropropene	ug/L (ppb)	50	<1	98	67-121
Carbon tetrachloride	ug/L (ppb)	50	<1	107	72-123
Benzene	ug/L (ppb)	50	<0.35	97	79-109
Trichloroethene	ug/L (ppb)	50	<1	97	75-109
1,2-Dichloropropane	ug/L (ppb)	50	<1	98	80-111
Bromodichloromethane	ug/L (ppb)	50	<1	107	78-117
Dibromomethane	ug/L (ppb)	50	<1	99	80-112
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	102	79-123
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	103	76-120
Toluene	ug/L (ppb)	50	<1	100	73-117
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	107	75-122
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	99	81-111
2-Hexanone	ug/L (ppb)	250	<10	101	75-126
1,3-Dichloropropane	ug/L (ppb)	50	<1	98	81-111
Tetrachloroethene	ug/L (ppb)	50	<1	101	72-113
Dibromochloromethane	ug/L (ppb)	50	<1	114	69-129
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	101	83-114
Chlorobenzene	ug/L (ppb)	50	<1	98	75-115
Ethylbenzene	ug/L (ppb)	50	<1	102	71-120
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	111	78-122
m,p-Xylene	ug/L (ppb)	100	<2	104	63-128
o-Xylene	ug/L (ppb)	50	<1	102	64-129
Styrene	ug/L (ppb)	50	<1	103	70-122
Isopropylbenzene	ug/L (ppb)	50	<1	105	76-118
Bromoform	ug/L (ppb)	50	<1	104	49-138
n-Propylbenzene	ug/L (ppb)	50	<1	106	74-117
Bromobenzene	ug/L (ppb)	50	<1	103	70-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	106	81-112
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	106	79-120
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	99	72-119
2-Chlorotoluene	ug/L (ppb)	50	<1	102	77-114
4-Chlorotoluene	ug/L (ppb)	50	<1	103	81-109
tert-Butylbenzene	ug/L (ppb)	50	<1	111	81-116
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	106	74-118
sec-Butylbenzene	ug/L (ppb)	50	<1	109	77-118
p-Isopropyltoluene	ug/L (ppb)	50	<1	107	64-132
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	98	81-111
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	95	78-110
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	97	81-111
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	108	69-129
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	93	74-115
Hexachlorobutadiene	ug/L (ppb)	50	<1	95	67-120
Naphthalene	ug/L (ppb)	50	<1	98	63-136
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	91	79-115

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/24/14
Date Received: 01/08/14
Project: Walker 080190, F&BI 401081

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)
Dichlorodifluoromethane	ug/L (ppb)	50	91	87	54-149	4
Chloromethane	ug/L (ppb)	50	88	85	67-133	3
Vinyl chloride	ug/L (ppb)	50	93	89	73-132	4
Bromomethane	ug/L (ppb)	50	188 vo	190 vo	69-123	1
Chloroethane	ug/L (ppb)	50	82	82	68-126	0
Trichlorofluoromethane	ug/L (ppb)	50	93	89	70-132	4
Acetone	ug/L (ppb)	250	81	83	44-145	2
1,1-Dichloroethene	ug/L (ppb)	50	98	94	75-119	4
Methylene chloride	ug/L (ppb)	50	167 vo	153 vo	63-132	9
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	94	91	70-122	3
trans-1,2-Dichloroethene	ug/L (ppb)	50	97	95	76-118	2
1,1-Dichloroethane	ug/L (ppb)	50	97	93	80-116	4
2,2-Dichloropropane	ug/L (ppb)	50	101	96	62-141	5
cis-1,2-Dichloroethene	ug/L (ppb)	50	94	90	81-111	4
Chloroform	ug/L (ppb)	50	97	95	81-109	2
2-Butanone (MEK)	ug/L (ppb)	250	94	95	53-140	1
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	95	93	79-109	2
1,1,1-Trichloroethane	ug/L (ppb)	50	105	102	80-116	3
1,1-Dichloropropene	ug/L (ppb)	50	95	93	78-112	2
Carbon tetrachloride	ug/L (ppb)	50	105	101	72-128	4
Benzene	ug/L (ppb)	50	96	93	81-108	3
Trichloroethene	ug/L (ppb)	50	96	94	77-108	2
1,2-Dichloropropane	ug/L (ppb)	50	99	97	82-109	2
Bromodichloromethane	ug/L (ppb)	50	106	104	76-120	2
Dibromomethane	ug/L (ppb)	50	100	98	80-110	2
4-Methyl-2-pentanone	ug/L (ppb)	250	105	105	59-142	0
cis-1,3-Dichloropropene	ug/L (ppb)	50	106	104	76-128	2
Toluene	ug/L (ppb)	50	98	96	83-108	2
trans-1,3-Dichloropropene	ug/L (ppb)	50	108	108	76-128	0
1,1,2-Trichloroethane	ug/L (ppb)	50	99	99	82-110	0
2-Hexanone	ug/L (ppb)	250	101	103	53-145	2
1,3-Dichloropropane	ug/L (ppb)	50	98	99	83-110	1
Tetrachloroethene	ug/L (ppb)	50	97	95	78-109	2
Dibromochloromethane	ug/L (ppb)	50	110	111	63-140	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	100	100	85-113	0
Chlorobenzene	ug/L (ppb)	50	96	94	84-108	2
Ethylbenzene	ug/L (ppb)	50	99	96	84-110	3
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	109	108	76-125	1
m,p-Xylene	ug/L (ppb)	100	102	101	84-112	1
o-Xylene	ug/L (ppb)	50	101	98	82-113	3
Styrene	ug/L (ppb)	50	102	101	84-116	1
Isopropylbenzene	ug/L (ppb)	50	102	99	81-122	3
Bromoform	ug/L (ppb)	50	100	102	40-161	2
n-Propylbenzene	ug/L (ppb)	50	104	98	81-115	6
Bromobenzene	ug/L (ppb)	50	99	97	80-113	2
1,3,5-Trimethylbenzene	ug/L (ppb)	50	104	100	83-117	4
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	101	98	79-118	3
1,2,3-Trichloropropane	ug/L (ppb)	50	98	99	74-116	1
2-Chlorotoluene	ug/L (ppb)	50	98	95	79-112	3
4-Chlorotoluene	ug/L (ppb)	50	100	97	81-113	3
tert-Butylbenzene	ug/L (ppb)	50	107	102	81-119	5
1,2,4-Trimethylbenzene	ug/L (ppb)	50	105	101	83-116	4
sec-Butylbenzene	ug/L (ppb)	50	106	101	83-116	5
p-Isopropyltoluene	ug/L (ppb)	50	104	100	82-119	4
1,3-Dichlorobenzene	ug/L (ppb)	50	96	93	83-111	3
1,4-Dichlorobenzene	ug/L (ppb)	50	93	90	82-109	3
1,2-Dichlorobenzene	ug/L (ppb)	50	95	92	83-111	3
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	106	106	62-133	0
1,2,4-Trichlorobenzene	ug/L (ppb)	50	94	93	77-117	1
Hexachlorobutadiene	ug/L (ppb)	50	94	95	74-118	1
Naphthalene	ug/L (ppb)	50	103	100	75-131	3
1,2,3-Trichlorobenzene	ug/L (ppb)	50	95	93	82-115	2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/24/14
Date Received: 01/08/14
Project: Walker 080190, F&BI 401081

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	87	85	67-116	2
Acenaphthylene	ug/L (ppb)	1	87	84	65-119	4
Acenaphthene	ug/L (ppb)	1	89	86	66-118	3
Fluorene	ug/L (ppb)	1	86	82	64-125	5
Phenanthrene	ug/L (ppb)	1	88	86	67-120	2
Anthracene	ug/L (ppb)	1	85	84	65-122	1
Fluoranthene	ug/L (ppb)	1	82	80	65-127	2
Pyrene	ug/L (ppb)	1	85	81	62-130	5
Benz(a)anthracene	ug/L (ppb)	1	83	80	60-118	4
Chrysene	ug/L (ppb)	1	88	83	66-125	6
Benzo(b)fluoranthene	ug/L (ppb)	1	73	68	55-135	7
Benzo(k)fluoranthene	ug/L (ppb)	1	73	68	62-125	7
Benzo(a)pyrene	ug/L (ppb)	1	69	65	58-127	6
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	43	43	36-142	0
Dibenz(a,h)anthracene	ug/L (ppb)	1	37	36 vo	37-133	3
Benzo(g,h,i)perylene	ug/L (ppb)	1	49	47	34-135	4

Date of Report: 01/24/14
Date Received: 01/08/14
Project: Walker 080190, F&BI 401081

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES FOR
POLYCHLORINATED BIPHENYLS AS
AROCLOR 1016/1260 BY EPA METHOD 8082A**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	ug/L (ppb)	2.5	91	94	70-130	3
Aroclor 1260	ug/L (ppb)	2.5	92	98	70-130	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.

A1 – More than one compound of similar molecule structure was identified with equal probability.

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 this range fell outside of acceptance criteria. The value reported is an estimate.

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

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

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. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

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

j – The result is below normal reporting limits. 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 analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is 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 compound indicated 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 in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

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.

IEH - AQUATIC RESEARCH
LABORATORY & CONSULTING SERVICES
3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER: FBI012-38 **PAGE 1**

REPORT DATE: 01/23/14

DATE SAMPLED: 01/07,08/14 **DATE RECEIVED:** 01/09/14

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 401081

CASE NARRATIVE

Three water samples were received by the laboratory in good condition and analyzed according to the chain of custody. No difficulties were encountered in the preparation or analysis of these samples. Sample data follows while QA/QC data is contained on subsequent pages.

SAMPLE DATA

SAMPLE ID	NITRATE (mg/L)	NITRITE (mg/L)	SULFATE (mg/L)	TOC (mg/L)
MW-20-010814	2.02	0.007	16.9	<0.250
MW-19-010814	2.66	0.006	22.7	0.254
MW-07-010714	1.39	0.006	28.4	<0.250

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**FBI012-38**		
REPORT DATE:	**01/23/14**		
DATE SAMPLED:	**01/07,08/14**	**DATE RECEIVED:**	**01/09/14**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 401081

QA/QC DATA

QC PARAMETER	NITRATE (mg/L)	NITRITE (mg/L)	SULFATE (mg/L)	TOC (mg/L)
METHOD	SM184500N03F	EPA 353.2	SM184500SO4E	SM205310B
DATE ANALYZED	01/09/14	01/09/14	01/17/14	01/23/14
DETECTION LIMIT	0.010	0.002	1.00	0.250
DUPLICATE				
SAMPLE ID	BATCH	MW-07-010714	MW-20-010814	BATCH
ORIGINAL	0.458	0.006	16.9	1.79
DUPLICATE	0.458	0.006	16.9	1.69
RPD	0.03%	0.00%	0.36%	5.80%
SPIKE SAMPLE				
SAMPLE ID	BATCH	MW-07-010714	MW-20-010814	BATCH
ORIGINAL	0.458	0.006	16.9	1.79
SPIKED SAMPLE	0.672	0.046	27.0	6.60
SPIKE ADDED	0.200	0.040	10.0	4.50
% RECOVERY	106.98%	100.00%	101.59%	106.89%
QC CHECK				
FOUND	0.407	0.040	10.3	4.01
TRUE	0.408	0.040	10.0	4.00
% RECOVERY	99.74%	100.00%	103.00%	100.25%
BLANK	<0.010	<0.002	<1.00	<0.250

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

SUBMITTED BY:

Damien Gadomski

Damien Gadomski
Project Manager

FB1012-38

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 Ag. Research	
PROJECT NAME/NO. 401081	PO # C-709.
REMARKS Please Email Results	

Page # 1 of 1

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	Dioxins and Furans by 8290	EPH	VPH	Nitrate	Sulfate	Nitrite ~~Alkalinity~~	TOC 415.1				Notes
MW-20-010814		1/8/14	0930	water					X	X	X	X				
MW-19-010814		↓	0830						X	X	X	X				
MW-07-010714		1/7/14	1130	↓					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	Friedman & Bruya	1/8/14	0910
Received by:	M. HENDRICKSON	ARI	1/9/14	9:00
Relinquished by:				
Received by:				

401081

SAMPLE CHAIN OF CUSTODY

ME 01-08-14 V2/Eq3/AI

Send Report To Alan Noell
Company Aspect Consulting
Address 401 2nd Ave S Ste 201
City, State, ZIP Seattle, WA 98104
Phone # 206-838-6597 Fax #

SAMPLERS (signature)

PROJECT NAME/NO. Walker 080190

PO#

REMARKS

Page # 1 of 1

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	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	PAHs ~~SVOCs~~ by 8270	HFS	Volatiles (8260)	TOC (415)	Fe (200.8)	Lead (200.8)	NO_3, NO_2, SO_4 (300)	PCBs (8082)	Notes
MW-20-010814	01 A-G	1/8/14	09:30	water	7							X	X	X		X		
MW-19-010814	02 A-G	1/8/14	08:30	water	7							X	X	X		X		
MW-07-010714	03 A-J	1/7/14	11:30	water	10					X		X	X	X	X	X	X	

NP

Samples received at 3 °C

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:		Judy Olesen	Aspect	1/8/14	14:15
Received by:		Nhan Phan	FeBI	1/8/14	1545
Relinquished by:					
Received by:					

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

February 6, 2014

Alan Noell, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Mr. Noell:

Included are the results from the testing of material submitted on January 23, 2014 from the Walker Chevrolet, F&BI 401273 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: data@aspectconsulting.com, Parker Wittman
ASP0206R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 23, 2014 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Walker Chevrolet, F&BI 401273 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
401273 -01	MW-11-012314
401273 -02	MW-14D-012314

Bromomethane in the 8260C matrix spike, laboratory control sample and laboratory control sample duplicate exceeded the acceptance criteria. The analyte was not detected in the sample, therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 02/06/14
Date Received: 01/23/14
Project: Walker Chevrolet, F&BI 401273
Date Extracted: 01/27/14
Date Analyzed: 01/27/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW-11-012314 401273-01	<100	86
Method Blank 04-0151 MB	<100	88

Date of Report: 02/06/14
Date Received: 01/23/14
Project: Walker Chevrolet, F&BI 401273
Date Extracted: 01/24/14
Date Analyzed: 01/24/14

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-134)
MW-11-012314 401273-01	<50	<250	114
Method Blank 04-164 MB2	<50	<250	113

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-11-012314	Client:	Aspect Consulting, LLC
Date Received:	01/23/14	Project:	Walker Chevrolet, F&BI 401273
Date Extracted:	01/28/14	Lab ID:	401273-01
Date Analyzed:	01/28/14	Data File:	401273-01.022
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	86	60	125

Analyte:	Concentration ug/L (ppb)
Lead	2.44

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Walker Chevrolet, F&BI 401273
Date Extracted:	01/28/14	Lab ID:	I4-044 mb
Date Analyzed:	01/28/14	Data File:	I4-044 mb.017
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Lead	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-11-012314	Client:	Aspect Consulting, LLC
Date Received:	01/23/14	Project:	Walker Chevrolet, F&BI 401273
Date Extracted:	01/24/14	Lab ID:	401273-01
Date Analyzed:	01/24/14	Data File:	012412.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	94	63	127
4-Bromofluorobenzene	95	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	1.4	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-14D-012314	Client:	Aspect Consulting, LLC
Date Received:	01/23/14	Project:	Walker Chevrolet, F&BI 401273
Date Extracted:	01/24/14	Lab ID:	401273-02
Date Analyzed:	01/24/14	Data File:	012413.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	95	63	127
4-Bromofluorobenzene	95	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	2.4
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	4.5	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	1.0	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	2.0
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Walker Chevrolet, F&BI 401273
Date Extracted:	01/24/14	Lab ID:	04-0055 mb
Date Analyzed:	01/24/14	Data File:	012407.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	95	63	127
4-Bromofluorobenzene	95	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-11-012314	Client:	Aspect Consulting, LLC
Date Received:	01/23/14	Project:	Walker Chevrolet, F&BI 401273
Date Extracted:	01/27/14	Lab ID:	401273-01
Date Analyzed:	01/29/14	Data File:	012837.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	50	150
Benzo(a)anthracene-d12	81	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.15
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	<0.05
Pyrene	<0.05
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	<0.05
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Walker Chevrolet, F&BI 401273
Date Extracted:	01/27/14	Lab ID:	04-175 mb
Date Analyzed:	01/28/14	Data File:	012816.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	88	50	150
Benzo(a)anthracene-d12	95	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	<0.05
Pyrene	<0.05
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	<0.05
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	MW-11-012314	Client:	Aspect Consulting, LLC
Date Received:	01/23/14	Project:	Walker Chevrolet, F&BI 401273
Date Extracted:	01/30/14	Lab ID:	401273-01
Date Analyzed:	01/31/14	Data File:	36.D\ECD1A.CH
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	75	50	150

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Walker Chevrolet, F&BI 401273
Date Extracted:	01/30/14	Lab ID:	04-217 mb
Date Analyzed:	01/31/14	Data File:	26.D\ECD1A.CH
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	mwdl

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	168 vo	50	150

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.1
Aroclor 1232	<0.1
Aroclor 1016	<0.1
Aroclor 1242	<0.1
Aroclor 1248	<0.1
Aroclor 1254	<0.1
Aroclor 1260	<0.1

Date of Report: 02/06/14
Date Received: 01/23/14
Project: Walker Chevrolet, F&BI 401273

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 401285-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	98	69-134

Date of Report: 02/06/14
Date Received: 01/23/14
Project: Walker Chevrolet, F&BI 401273

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	105	103	58-134	2

Date of Report: 02/06/14
Date Received: 01/23/14
Project: Walker Chevrolet, F&BI 401273

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

Laboratory Code: 401312-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Lead	ug/L (ppb)	10	3.25	97 b	88 b	79-121	10 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	97	83-115

Date of Report: 02/06/14
Date Received: 01/23/14
Project: Walker Chevrolet, F&BI 401273

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

Laboratory Code: 401255-10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	102	10-172
Chloromethane	ug/L (ppb)	50	<10	90	25-166
Vinyl chloride	ug/L (ppb)	50	<0.2	93	36-166
Bromomethane	ug/L (ppb)	50	<1	193 vo	47-169
Chloroethane	ug/L (ppb)	50	<1	139	46-160
Trichlorofluoromethane	ug/L (ppb)	50	<1	105	44-165
Acetone	ug/L (ppb)	250	<10	94	10-182
1,1-Dichloroethene	ug/L (ppb)	50	<1	97	60-136
Methylene chloride	ug/L (ppb)	50	<5	105	67-132
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	99	74-127
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	98	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	98	70-128
2,2-Dichloropropane	ug/L (ppb)	50	<1	128	36-154
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	101	71-127
Chloroform	ug/L (ppb)	50	<1	98	65-132
2-Butanone (MEK)	ug/L (ppb)	250	<10	96	10-129
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	97	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	104	60-146
1,1-Dichloropropene	ug/L (ppb)	50	<1	96	69-133
Carbon tetrachloride	ug/L (ppb)	50	<1	107	56-152
Benzene	ug/L (ppb)	50	<0.35	94	76-125
Trichloroethene	ug/L (ppb)	50	<1	97	66-135
1,2-Dichloropropane	ug/L (ppb)	50	<1	96	78-125
Bromodichloromethane	ug/L (ppb)	50	<1	103	61-150
Dibromomethane	ug/L (ppb)	50	<1	99	66-141
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	99	10-185
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	107	72-132
Toluene	ug/L (ppb)	50	110	167 b	76-122
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	105	76-130
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	97	68-131
2-Hexanone	ug/L (ppb)	250	<10	98	10-185
1,3-Dichloropropane	ug/L (ppb)	50	<1	95	71-128
Tetrachloroethene	ug/L (ppb)	50	<1	97	10-226
Dibromochloromethane	ug/L (ppb)	50	<1	112	70-139
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	104	69-134
Chlorobenzene	ug/L (ppb)	50	<1	97	77-122
Ethylbenzene	ug/L (ppb)	50	<1	97	69-135
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	111	73-137
m,p-Xylene	ug/L (ppb)	100	<2	98	69-135
o-Xylene	ug/L (ppb)	50	<1	102	60-140
Styrene	ug/L (ppb)	50	<1	102	71-133
Isopropylbenzene	ug/L (ppb)	50	<1	102	65-142
Bromoform	ug/L (ppb)	50	<1	103	65-142
n-Propylbenzene	ug/L (ppb)	50	<1	98	58-144
Bromobenzene	ug/L (ppb)	50	<1	96	75-124
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	101	66-137
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	103	51-154
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	92	53-150
2-Chlorotoluene	ug/L (ppb)	50	<1	96	66-127
4-Chlorotoluene	ug/L (ppb)	50	<1	96	65-130
tert-Butylbenzene	ug/L (ppb)	50	<1	102	65-137
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	101	59-146
sec-Butylbenzene	ug/L (ppb)	50	<1	99	64-140
p-Isopropyltoluene	ug/L (ppb)	50	<1	101	65-141
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	96	72-123
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	95	69-126
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	97	69-128
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	112	32-164
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	96	66-136
Hexachlorobutadiene	ug/L (ppb)	50	<1	83	60-143
Naphthalene	ug/L (ppb)	50	<1	100	44-164
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	93	69-148

Date of Report: 02/06/14
Date Received: 01/23/14
Project: Walker Chevrolet, F&BI 401273

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)
Dichlorodifluoromethane	ug/L (ppb)	50	108	113	25-158	5
Chloromethane	ug/L (ppb)	50	96	97	45-156	1
Vinyl chloride	ug/L (ppb)	50	98	98	50-154	0
Bromomethane	ug/L (ppb)	50	183 vo	189 vo	55-143	3
Chloroethane	ug/L (ppb)	50	140	141	58-146	1
Trichlorofluoromethane	ug/L (ppb)	250	112	113	50-150	1
Acetone	ug/L (ppb)	250	113	113	53-131	0
1,1-Dichloroethene	ug/L (ppb)	50	102	103	67-136	1
Methylene chloride	ug/L (ppb)	50	95	97	39-148	2
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	102	103	64-147	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	98	100	68-128	2
1,1-Dichloroethane	ug/L (ppb)	50	99	100	79-121	1
2,2-Dichloropropane	ug/L (ppb)	50	142	143	55-143	1
cis-1,2-Dichloroethene	ug/L (ppb)	50	99	101	80-123	2
Chloroform	ug/L (ppb)	50	96	97	80-121	1
2-Butanone (MEK)	ug/L (ppb)	250	104	106	57-149	2
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	96	98	73-132	2
1,1,1-Trichloroethane	ug/L (ppb)	50	107	108	83-130	1
1,1-Dichloropropene	ug/L (ppb)	50	96	97	77-129	1
Carbon tetrachloride	ug/L (ppb)	50	112	115	75-158	3
Benzene	ug/L (ppb)	50	94	95	69-134	1
Trichloroethene	ug/L (ppb)	50	96	98	80-120	2
1,2-Dichloropropane	ug/L (ppb)	50	98	99	77-123	1
Bromodichloromethane	ug/L (ppb)	50	103	104	81-133	1
Dibromomethane	ug/L (ppb)	50	99	100	82-125	1
4-Methyl-2-pentanone	ug/L (ppb)	250	104	105	65-138	1
cis-1,3-Dichloropropene	ug/L (ppb)	50	111	112	82-132	1
Toluene	ug/L (ppb)	50	94	95	72-122	1
trans-1,3-Dichloropropene	ug/L (ppb)	50	108	109	80-136	1
1,1,2-Trichloroethane	ug/L (ppb)	50	97	98	75-124	1
2-Hexanone	ug/L (ppb)	250	101	101	60-136	0
1,3-Dichloropropane	ug/L (ppb)	50	95	96	76-126	1
Tetrachloroethene	ug/L (ppb)	50	97	98	76-121	1
Dibromochloromethane	ug/L (ppb)	50	113	116	84-133	3
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	105	106	82-125	1
Chlorobenzene	ug/L (ppb)	50	96	97	83-114	1
Ethylbenzene	ug/L (ppb)	50	97	99	77-124	2
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	112	114	84-127	2
m,p-Xylene	ug/L (ppb)	100	98	99	83-125	1
o-Xylene	ug/L (ppb)	50	101	103	81-121	2
Styrene	ug/L (ppb)	50	104	105	84-119	1
Isopropylbenzene	ug/L (ppb)	50	103	105	85-117	2
Bromoform	ug/L (ppb)	50	106	109	74-136	3
n-Propylbenzene	ug/L (ppb)	50	99	100	74-126	1
Bromobenzene	ug/L (ppb)	50	96	97	80-121	1
1,3,5-Trimethylbenzene	ug/L (ppb)	50	102	104	78-123	2
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	104	104	66-126	0
1,2,3-Trichloropropane	ug/L (ppb)	50	95	96	67-124	1
2-Chlorotoluene	ug/L (ppb)	50	97	98	77-127	1
4-Chlorotoluene	ug/L (ppb)	50	96	98	78-128	2
tert-Butylbenzene	ug/L (ppb)	50	103	104	80-123	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	102	104	79-122	2
sec-Butylbenzene	ug/L (ppb)	50	102	104	80-125	2
p-Isopropyltoluene	ug/L (ppb)	50	103	104	81-123	1
1,3-Dichlorobenzene	ug/L (ppb)	50	97	98	85-116	1
1,4-Dichlorobenzene	ug/L (ppb)	50	95	97	84-121	2
1,2-Dichlorobenzene	ug/L (ppb)	50	97	99	85-116	2
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	124	123	57-141	1
1,2,4-Trichlorobenzene	ug/L (ppb)	50	101	102	72-130	1
Hexachlorobutadiene	ug/L (ppb)	50	94	95	53-141	1
Naphthalene	ug/L (ppb)	50	105	107	64-133	2
1,2,3-Trichlorobenzene	ug/L (ppb)	50	98	100	65-136	2

Date of Report: 02/06/14
Date Received: 01/23/14
Project: Walker Chevrolet, F&BI 401273

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	89	89	67-116	0
Acenaphthylene	ug/L (ppb)	1	92	93	65-119	1
Acenaphthene	ug/L (ppb)	1	92	92	66-118	0
Fluorene	ug/L (ppb)	1	102	93	64-125	9
Phenanthrene	ug/L (ppb)	1	91	91	67-120	0
Anthracene	ug/L (ppb)	1	93	92	65-122	1
Fluoranthene	ug/L (ppb)	1	95	94	65-127	1
Pyrene	ug/L (ppb)	1	92	95	62-130	3
Benz(a)anthracene	ug/L (ppb)	1	88	90	60-118	2
Chrysene	ug/L (ppb)	1	96	94	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	1	108	107	55-135	1
Benzo(k)fluoranthene	ug/L (ppb)	1	105	104	62-125	1
Benzo(a)pyrene	ug/L (ppb)	1	102	103	58-127	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	96	99	36-142	3
Dibenz(a,h)anthracene	ug/L (ppb)	1	87	78	37-133	11
Benzo(g,h,i)perylene	ug/L (ppb)	1	86	85	34-135	1

Date of Report: 02/06/14
Date Received: 01/23/14
Project: Walker Chevrolet, F&BI 401273

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES FOR
POLYCHLORINATED BIPHENYLS AS
AROCLOR 1016/1260 BY EPA METHOD 8082A**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	ug/L (ppb)	2.5	101	93	70-130	8
Aroclor 1260	ug/L (ppb)	2.5	100	95	70-130	5

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.

A1 – More than one compound of similar molecule structure was identified with equal probability.

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 this range fell outside of acceptance criteria. The value reported is an estimate.

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

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

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. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

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

j – The result is below normal reporting limits. 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 analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is 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 compound indicated 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 in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

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.

401273

SAMPLE CHAIN OF CUSTODY

ME 01/23/14 AI5 / V2

[redacted] Page # 1 of ___

Send Report To Alan Noell

Company Aspect Consulting

Address 401 2nd Ave. S., Ste. 201

City, State, ZIP Seattle, WA 98104

Phone # (206) 328-7443 Fax # (206) 838-5853

SAMPLERS (signature)

PROJECT NAME/NO.	PO#
Walker Chevrolet	080190-004-11

REMARKS

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	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	Volatiles ~~VOCs by 8260~~	PAHs ~~SVOCs by 8270~~	HFS	Pb-total (200.8)	PCBs (8082)					Notes
MW-11-012314	01 A-L	1/23/14	10:10	water	12	X	X		X	X		X	X					
MW-14D-012314	02 A-D	1/23/14	11:55	water	4				X									

Samples received at 2 °C

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:		Judy Oleson	Aspect	1/23/14	1:45
Received by:		Do Vo	F&BI	"	15:45
Relinquished by:					
Received by:					

FORMS\COC\COC.DOC

Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 29, 2014

Alan Noell
Aspect Consulting
401 - 2nd Avenue, Suite 201
Seattle, WA 98104

RE: Walker Chevrolet, 110008-004-12
ARI Job: XU34

Dear Alan:

Please find enclosed the Chain of Custody record (COC), sample receipt documentation, and the final results for samples from the project referenced above. Analytical Resources, Inc. accepted one water sample on January 10, 2014. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form.

The sample was analyzed for VOCs, PAHs, NWTPH-Dx, NWTPH-Gx, total metals, and various conventional parameters, as requested.

The LCS percent recoveries of Acrolein, 1,2-Dibromo-3-chloropropane, and 1,2,3-Trichloropropane were outside the control limits for **LCS-011514A**. The LCSD percent recovery of 1,2,3-Trichloropropane was also outside the control limits. All other percent recoveries were within control limits. No corrective action was taken.

The continuing calibration fell outside the 20% control limit low for Bromoethane, Carbon Disulfide, Bromoform, 1,1,2,2-Tetrachloroethane, 1,2,3-Trichloropropane, 1,2-Dibromo-3-chloropropane, and Naphthalene. The continuing calibration was also outside the control limit high for Acrolein. All detected results for these compounds have been flagged with a "Q" qualifier. No further corrective action was taken.

The matrix spike percent recovery of iron was outside the control limits high for sample **MW-1-011014**. All relevant data have been flagged with an "N" qualifier on the Form V. No further corrective action was taken.

The duplicate RPD of iron was outside the control limit for sample **MW-1-011014**. All relevant data have been flagged with a "*" qualifier on the Form VI. No further corrective action was taken.

An electronic copy of this report as well as all supporting raw data will remain on file with ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager
(206) 695-6214
cheronneo@arilabs.com

cc: eFile XU34

Enclosures

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

ARI Assigned Number: XU34	Turn-around Requested:	Page: 1	of 1
ARI/Client Company: Aspect Consulting	Phone: (206)838-6592	Date: 1/10/14	Ice Present? Y
Client Contact: Alan Noell		No. of Coolers: 1	Cooler Temps: 5.6
Client Project Name: Walker Chevrolet			
Client Project #: 110008-004-12	Samplers: JLO		

Sample ID	Date	Time	Matrix	No. Containers	TPH (diesel)	TPH (gas)	volatiles (8260)	PAHS (8270)	NO_3, NO_2, SO_4 (300)	TOC (415.1)	Pb+Fe (200.8)		Notes/Comments
MW-1-011014	1/10/14	16:25	Water	15	X	X	X	X	X	X	X		

Comments/Special Instructions	Relinquished by	Received by	Relinquished by	Received by
	(Signature) [signature]	(Signature) [signature]	(Signature)	(Signature)
	Printed Name: Judy Oleson	Printed Name: Jennifer Millsap	Printed Name	Printed Name
	Company: Aspect Consulting	Company: ARI	Company	Company
	Date & Time: 1/10/14 17:45	Date & Time: 1/10/14 1745	Date & Time	Date & Time

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Aspect

COC No(s): NA

Assigned ARI Job No: XU34

Project Name: Walker Chevrolet

Delivered by: Fed-Ex UPS Courier Hand Delivered Other:

Tracking No.: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 5.6
Time: 1743

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877952

Cooler Accepted by: JM Date: 1/10/14 Time:

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other:

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI NA

Was Sample Split by ARI: NA YES Date/Time: Equipment: Split by:

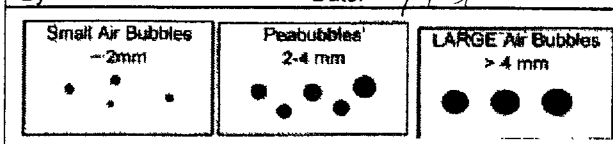
Samples Logged by: JM Date: 1/13/14 Time: 733

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:
TC volume collected in 522 mL HDPE.

By: JM Date: 1/13/14



Small → "sm" (< 2 mm)	
Peabubbles → "pb" (2 to < 4 mm)	
Large → "lg" (4 to < 6 mm)	
Headspace → "hs" (> 6 mm)	

PRESERVATION VERIFICATION 01/13/14

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **XU34**

Inquiry Number: NONE
Analysis Requested: 01/13/14
Contact: Noell, Alan
Client: Aspect Consulting
Logged by: JM
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Mark
VTSR: 01/10/14

Project #: 11008-004-12
Project: Walker Chevrolet
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
14-696 **XU34A**	MW-1-011014						TOT pass					fail						TOC	<2		2ml H_2SO_4 9N	1-13-14 W

Samples arrived in lab unpreserved
1-10-14
W

Checked By JM Date 1/13/14

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: XU34
Client: Aspect Consulting
Project Event: 11008-004-12
Project Name: Walker Chevrolet

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-1-011014	XU34A	14-696	Water	01/10/14 16:25	01/10/14 17:45

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: MW-1-011014
SAMPLE

Lab Sample ID: XU34A
LIMS ID: 14-696
Matrix: Water
Data Release Authorized: MW
Reported: 01/16/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12
Date Sampled: 01/10/14
Date Received: 01/10/14

Instrument/Analyst: NT3/LH
Date Analyzed: 01/15/14 17:18

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.20	< 0.20	U
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
67-66-3	**Chloroform**	**0.20**	**0.39**	
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	**Trichloroethene**	**0.20**	**0.40**	
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MW-1-011014**

SAMPLE

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: XU34A
LIMS ID: 14-696
Matrix: Water
Date Analyzed: 01/15/14 17:18

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.8%
d8-Toluene	101%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	104%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-011514A	Method Blank	10	95.4%	102%	104%	102%	0
LCS-011514A	Lab Control	10	97.9%	102%	104%	102%	0
LCSD-011514A	Lab Control Dup	10	101%	104%	106%	103%	0
XU34A	MW-1-011014	10	98.8%	101%	102%	104%	0

SW8260C	LCS/MB LIMITS	QC LIMITS
(DCE) = d4-1,2-Dichloroethane	(80-120)	(80-130)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 14-696 to 14-696

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-011514A**

LAB CONTROL SAMPLE

Lab Sample ID: LCS-011514A
LIMS ID: 14-696
Matrix: Water
Data Release Authorized: MW
Reported: 01/16/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT3/LH
LCSD: NT3/LH
Date Analyzed LCS: 01/15/14 09:57
LCSD: 01/15/14 10:23

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	11.3	10.0	113%	11.1	10.0	111%	1.8%
Bromomethane	10.4	10.0	104%	10.3	10.0	103%	1.0%
Vinyl Chloride	10.6	10.0	106%	10.7	10.0	107%	0.9%
Chloroethane	9.60	10.0	96.0%	9.68	10.0	96.8%	0.8%
Methylene Chloride	9.68	10.0	96.8%	9.81	10.0	98.1%	1.3%
Acetone	54.3	50.0	109%	56.7	50.0	113%	4.3%
Carbon Disulfide	7.88 Q	10.0	78.8%	7.81 Q	10.0	78.1%	0.9%
1,1-Dichloroethene	9.50	10.0	95.0%	9.66	10.0	96.6%	1.7%
1,1-Dichloroethane	9.86	10.0	98.6%	9.91	10.0	99.1%	0.5%
trans-1,2-Dichloroethene	9.40	10.0	94.0%	9.36	10.0	93.6%	0.4%
cis-1,2-Dichloroethene	9.81	10.0	98.1%	9.86	10.0	98.6%	0.5%
Chloroform	9.93	10.0	99.3%	10.2	10.0	102%	2.7%
1,2-Dichloroethane	9.87	10.0	98.7%	9.86	10.0	98.6%	0.1%
2-Butanone	51.3	50.0	103%	51.2	50.0	102%	0.2%
1,1,1-Trichloroethane	9.82	10.0	98.2%	9.50	10.0	95.0%	3.3%
Carbon Tetrachloride	9.49	10.0	94.9%	9.46	10.0	94.6%	0.3%
Vinyl Acetate	9.32	10.0	93.2%	9.69	10.0	96.9%	3.9%
Bromodichloromethane	9.38	10.0	93.8%	9.55	10.0	95.5%	1.8%
1,2-Dichloropropane	10.2	10.0	102%	10.1	10.0	101%	1.0%
cis-1,3-Dichloropropene	9.87	10.0	98.7%	10.1	10.0	101%	2.3%
Trichloroethene	10.4	10.0	104%	10.2	10.0	102%	1.9%
Dibromochloromethane	9.01	10.0	90.1%	8.93	10.0	89.3%	0.9%
1,1,2-Trichloroethane	9.70	10.0	97.0%	9.87	10.0	98.7%	1.7%
Benzene	10.2	10.0	102%	10.2	10.0	102%	0.0%
trans-1,3-Dichloropropene	9.58	10.0	95.8%	9.72	10.0	97.2%	1.5%
2-Chloroethylvinylether	9.91	10.0	99.1%	10.0	10.0	100%	0.9%
Bromoform	8.40 Q	10.0	84.0%	8.75 Q	10.0	87.5%	4.1%
4-Methyl-2-Pentanone (MIBK)	52.3	50.0	105%	54.1	50.0	108%	3.4%
2-Hexanone	46.6	50.0	93.2%	48.1	50.0	96.2%	3.2%
Tetrachloroethene	8.99	10.0	89.9%	8.86	10.0	88.6%	1.5%
1,1,2,2-Tetrachloroethane	8.28 Q	10.0	82.8%	8.34 Q	10.0	83.4%	0.7%
Toluene	10.1	10.0	101%	10.5	10.0	105%	3.9%
Chlorobenzene	9.41	10.0	94.1%	9.49	10.0	94.9%	0.8%
Ethylbenzene	9.55	10.0	95.5%	9.77	10.0	97.7%	2.3%
Styrene	9.70	10.0	97.0%	9.74	10.0	97.4%	0.4%
Trichlorofluoromethane	9.91	10.0	99.1%	9.72	10.0	97.2%	1.9%
1,1,2-Trichloro-1,2,2-trifluoroetha	8.68	10.0	86.8%	8.66	10.0	86.6%	0.2%
m,p-Xylene	19.2	20.0	96.0%	19.8	20.0	99.0%	3.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-011514A**

LAB CONTROL SAMPLE

Lab Sample ID: LCS-011514A
LIMS ID: 14-696
Matrix: Water

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
o-Xylene	9.80	10.0	98.0%	10.0	10.0	100%	2.0%
1,2-Dichlorobenzene	9.48	10.0	94.8%	9.40	10.0	94.0%	0.8%
1,3-Dichlorobenzene	9.44	10.0	94.4%	9.42	10.0	94.2%	0.2%
1,4-Dichlorobenzene	9.39	10.0	93.9%	9.53	10.0	95.3%	1.5%
Acrolein	71.6 Q	50.0	143%	75.1 Q	50.0	150%	4.8%
Iodomethane	8.30	10.0	83.0%	8.55	10.0	85.5%	3.0%
Bromoethane	8.14 Q	10.0	81.4%	7.85 Q	10.0	78.5%	3.6%
Acrylonitrile	10.1	10.0	101%	10.6	10.0	106%	4.8%
1,1-Dichloropropene	9.86	10.0	98.6%	9.95	10.0	99.5%	0.9%
Dibromomethane	9.84	10.0	98.4%	9.90	10.0	99.0%	0.6%
1,1,1,2-Tetrachloroethane	9.29	10.0	92.9%	9.72	10.0	97.2%	4.5%
1,2-Dibromo-3-chloropropane	7.49 Q	10.0	74.9%	7.85 Q	10.0	78.5%	4.7%
1,2,3-Trichloropropane	7.92 Q	10.0	79.2%	8.46 Q	10.0	84.6%	6.6%
trans-1,4-Dichloro-2-butene	9.04	10.0	90.4%	9.28	10.0	92.8%	2.6%
1,3,5-Trimethylbenzene	9.28	10.0	92.8%	9.51	10.0	95.1%	2.4%
1,2,4-Trimethylbenzene	9.43	10.0	94.3%	9.41	10.0	94.1%	0.2%
Hexachlorobutadiene	8.85	10.0	88.5%	8.56	10.0	85.6%	3.3%
1,2-Dibromoethane	10.3	10.0	103%	10.5	10.0	105%	1.9%
Bromochloromethane	10.0	10.0	100%	10.0	10.0	100%	0.0%
2,2-Dichloropropane	9.77	10.0	97.7%	9.43	10.0	94.3%	3.5%
1,3-Dichloropropane	8.79	10.0	87.9%	8.85	10.0	88.5%	0.7%
Isopropylbenzene	9.12	10.0	91.2%	9.40	10.0	94.0%	3.0%
n-Propylbenzene	9.19	10.0	91.9%	9.34	10.0	93.4%	1.6%
Bromobenzene	9.04	10.0	90.4%	9.16	10.0	91.6%	1.3%
2-Chlorotoluene	9.10	10.0	91.0%	9.19	10.0	91.9%	1.0%
4-Chlorotoluene	8.98	10.0	89.8%	9.13	10.0	91.3%	1.7%
tert-Butylbenzene	8.97	10.0	89.7%	9.17	10.0	91.7%	2.2%
sec-Butylbenzene	9.16	10.0	91.6%	9.31	10.0	93.1%	1.6%
4-Isopropyltoluene	9.19	10.0	91.9%	9.28	10.0	92.8%	1.0%
n-Butylbenzene	9.65	10.0	96.5%	9.64	10.0	96.4%	0.1%
1,2,4-Trichlorobenzene	10.2	10.0	102%	9.82	10.0	98.2%	3.8%
Naphthalene	8.89 Q	10.0	88.9%	8.72 Q	10.0	87.2%	1.9%
1,2,3-Trichlorobenzene	11.8	10.0	118%	11.5	10.0	115%	2.6%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	97.9%	101%
d8-Toluene	102%	104%
Bromofluorobenzene	104%	106%
d4-1,2-Dichlorobenzene	102%	103%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-011514A**

METHOD BLANK

Lab Sample ID: MB-011514A
LIMS ID: 14-696
Matrix: Water
Data Release Authorized: MW
Reported: 01/16/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT3/LH
Date Analyzed: 01/15/14 10:49

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.20	< 0.20	U
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: MB-011514A
METHOD BLANK

Lab Sample ID: MB-011514A
LIMS ID: 14-696
Matrix: Water
Date Analyzed: 01/15/14 10:49

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	95.4%
d8-Toluene	102%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: MW-1-011014
SAMPLE

Lab Sample ID: XU34A
LIMS ID: 14-696
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
Event: 11008-004-12
Date Sampled: 01/10/14
Date Received: 01/10/14

Date Extracted: 01/16/14
Date Analyzed: 01/20/14 16:19
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery	
d10-Fluoranthene	69.7%
d10-2-Methylnaphthalene	54.3%
d14-Dibenzo(a,h)anthracene	55.3%

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12

Client ID	FLN	MNP	DBA	TOT OUT
MB-011614	77.7%	64.0%	62.3%	0
LCS-011614	77.3%	64.0%	63.7%	0
LCSD-011614	75.0%	64.0%	67.3%	0
MW-1-011014	69.7%	54.3%	55.3%	0

	LCS/MB LIMITS	QC LIMITS
(FLN) = d10-Fluoranthene	(52-125)	(46-121)
(MNP) = d10-2-Methylnaphthalene	(37-120)	(31-120)
(DBA) = d14-Dibenzo(a,h)anthracene	(16-132)	(10-125)

Prep Method: SW3520C
Log Number Range: 14-696 to 14-696

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LCS-011614
LAB CONTROL SAMPLE

Lab Sample ID: LCS-011614
LIMS ID: 14-696
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
Event: 11008-004-12
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 01/16/14

Date Analyzed LCS: 01/20/14 15:23
LCSD: 01/20/14 15:51
Instrument/Analyst LCS: NT8/JZ
LCSD: NT8/JZ

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	**LCS**	**Spike Added-LCS**	**LCS Recovery**	**LCSD**	**Spike Added-LCSD**	**LCSD Recovery**	**RPD**
Naphthalene	1.72	3.00	57.3%	1.76	3.00	58.7%	2.3%
2-Methylnaphthalene	1.77	3.00	59.0%	1.80	3.00	60.0%	1.7%
1-Methylnaphthalene	1.72	3.00	57.3%	1.79	3.00	59.7%	4.0%
Acenaphthylene	1.68	3.00	56.0%	1.68	3.00	56.0%	0.0%
Acenaphthene	1.75	3.00	58.3%	1.74	3.00	58.0%	0.6%
Fluorene	1.89	3.00	63.0%	1.88	3.00	62.7%	0.5%
Phenanthrene	1.94	3.00	64.7%	1.96	3.00	65.3%	1.0%
Anthracene	1.88	3.00	62.7%	1.89	3.00	63.0%	0.5%
Fluoranthene	2.14	3.00	71.3%	2.16	3.00	72.0%	0.9%
Pyrene	1.93	3.00	64.3%	1.96	3.00	65.3%	1.5%
Benzo(a)anthracene	1.99	3.00	66.3%	2.03	3.00	67.7%	2.0%
Chrysene	2.12	3.00	70.7%	2.11	3.00	70.3%	0.5%
Benzo(b)fluoranthene	2.22	3.00	74.0%	2.12	3.00	70.7%	4.6%
Benzo(k)fluoranthene	2.11	3.00	70.3%	2.16	3.00	72.0%	2.3%
Benzo(a)pyrene	1.87	3.00	62.3%	1.96	3.00	65.3%	4.7%
Indeno(1,2,3-cd)pyrene	1.91	3.00	63.7%	2.04	3.00	68.0%	6.6%
Dibenz(a,h)anthracene	1.85	3.00	61.7%	1.95	3.00	65.0%	5.3%
Benzo(g,h,i)perylene	1.88	3.00	62.7%	1.97	3.00	65.7%	4.7%
Dibenzofuran	1.82	3.00	60.7%	1.83	3.00	61.0%	0.5%
Total Benzofluoranthenes	6.33	9.00	70.3%	6.25	9.00	69.4%	1.3%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	**LCSD**
d10-Fluoranthene	77.3%	75.0%
d10-2-Methylnaphthalene	64.0%	64.0%
d14-Dibenzo(a,h)anthracene	63.7%	67.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: MB-011614
METHOD BLANK

Lab Sample ID: MB-011614
LIMS ID: 14-696
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
Event: 11008-004-12
Date Sampled: NA
Date Received: NA

Date Extracted: 01/16/14
Date Analyzed: 01/20/14 14:56
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	77.7%
d10-2-Methylnaphthalene	64.0%
d14-Dibenzo(a,h)anthracene	62.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID
Extraction Method: SW3510C
Page 1 of 1

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12

Matrix: Water

Date Received: 01/10/14

Data Release Authorized:
Reported: 01/23/14

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DF	Range/Surrogate	RL	Result
MB-011614	Method Blank	01/16/14	01/22/14	1.00	Diesel Range	0.10	< 0.10 U
14-696	HC ID: ---		FID9	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		101%
XU34A	MW-1-011014	01/16/14	01/22/14	1.00	Diesel Range	0.10	< 0.10 U
14-696	HC ID: ---		FID9	1.0	Motor Oil Range	0.20	< 0.20 U
					o-Terphenyl		87.7%

Reported in mg/L (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel range quantitation on total peaks in the range from C12 to C24.
Motor Oil range quantitation on total peaks in the range from C24 to C38.
HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12

Client ID	OTER	TOT OUT
MB-011614	101%	0
LCS-011614	100%	0
LCSD-011614	98.3%	0
MW-1-011014	87.7%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: SW3510C
Log Number Range: 14-696 to 14-696

FORM-II TPHD

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: LCS-011614
LCS/LCSD

Lab Sample ID: LCS-011614
LIMS ID: 14-696
Matrix: Water
Data Release Authorized:
Reported: 01/23/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 01/16/14

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Date Analyzed LCS: 01/22/14 16:03
LCSD: 01/22/14 16:23
Instrument/Analyst LCS: FID9/JLW
LCSD: FID9/JLW

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	3.16	3.00	105%	3.31	3.00	110%	4.6%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	100%	98.3%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: XU34
Project: Walker Chevrolet
11008-004-12

Matrix: Water
Date Received: 01/10/14

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
14-696-011614MB1	Method Blank	500 mL	1.00 mL	01/16/14
14-696-011614LCS1	Lab Control	500 mL	1.00 mL	01/16/14
14-696-011614LCSD1	Lab Control Dup	500 mL	1.00 mL	01/16/14
14-696-XU34A	MW-1-011014	500 mL	1.00 mL	01/16/14

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
Event: 11008-004-12

Data Release Authorized: MW
Reported: 01/15/14

ARI ID	Client ID	Analysis Date	DL	Range	Result
MB-011414	Method Blank	01/14/14	1.0	Gasoline	< 0.25 U
14-696		PID1		HC ID	---
				Trifluorotoluene	99.1%
				Bromobenzene	95.8%
XU34A	MW-1-011014	01/14/14	1.0	Gasoline	< 0.25 U
14-696		PID1		HC ID	---
				Trifluorotoluene	97.0%
				Bromobenzene	94.7%

Gasoline values reported in mg/L (ppm)

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

ANALYTICAL RESOURCES INCORPORATED

TPHG WATER SURROGATE RECOVERY SUMMARY

ARI Job: XU34
Matrix: Water

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
Event: 11008-004-12

Client ID	TFT	BBZ	TOT OUT
MB-011414	99.1%	95.8%	0
LCS-011414	113%	101%	0
LCSD-011414	114%	103%	0
MW-1-011014	97.0%	94.7%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(80-120)
(BBZ) = Bromobenzene	(80-120)	(80-120)

Log Number Range: 14-696 to 14-696

FORM II TPHG

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG

Sample ID: LCS-011414
LAB CONTROL SAMPLE

Lab Sample ID: LCS-011414
LIMS ID: 14-696
Matrix: Water
Data Release Authorized:
Reported: 01/15/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
Event: 11008-004-12
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 01/14/14 10:36
LCSD: 01/14/14 11:05
Instrument/Analyst LCS: PID1/PKC
LCSD: PID1/PKC

Purge Volume: 5.0 mL

Dilution Factor LCS: 1.0
LCSD: 1.0

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	2.46	2.50	98.4%	2.55	2.50	102%	3.6%

Reported in mg/L (ppm)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	113%	114%
Bromobenzene	101%	103%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: MW-1-011014
SAMPLE

Lab Sample ID: XU34A
LIMS ID: 14-696
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12
Date Sampled: 01/10/14
Date Received: 01/10/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	01/14/14	200.8	01/20/14	**7439-89-6**	**Iron**	100	**4,070**	
200.8	01/14/14	200.8	01/20/14	**7439-92-1**	**Lead**	0.1	**2.0**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: MW-1-011014
MATRIX SPIKE

Lab Sample ID: XU34A
LIMS ID: 14-696
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12
Date Sampled: 01/10/14
Date Received: 01/10/14

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Iron	200.8	4,070	11,300	5,000	145%	N
Lead	200.8	2.0	23.2	25.0	84.8%	

Reported in µg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked
NR-Not Recovered

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: MW-1-011014
DUPLICATE

Lab Sample ID: XU34A
LIMS ID: 14-696
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12
Date Sampled: 01/10/14
Date Received: 01/10/14

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Iron	200.8	4,070	6,450	45.2%	+/- 20%	*
Lead	200.8	2.0	2.3	14.0%	+/- 20%	

Reported in µg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: LAB CONTROL

Lab Sample ID: XU34LCS
LIMS ID: 14-696
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Iron	200.8	5120	5000	102%	
Lead	200.8	23.1	25.0	92.4%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

FORM-VII

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: METHOD BLANK

Lab Sample ID: XU34MB
LIMS ID: 14-696
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU34-Aspect Consulting
Project: Walker Chevrolet
11008-004-12
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	01/14/14	200.8	01/20/14	7439-89-6	Iron	20	20	U
200.8	01/14/14	200.8	01/20/14	7439-92-1	Lead	0.1	0.1	U

U-Analyte undetected at given RL
RL-Reporting Limit

SAMPLE RESULTS-CONVENTIONALS
XU34-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 01/28/14

Project: Walker Chevrolet
Event: 11008-004-12
Date Sampled: 01/10/14
Date Received: 01/10/14

Client ID: MW-1-011014
ARI ID: 14-696 XU34A

Analyte	Date Batch	Method	Units	RL	Sample
N-Nitrate	01/11/14 011114#1	EPA 300.0	mg-N/L	0.1	0.2
N-Nitrite	01/11/14 011114#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
Sulfate	01/18/14 011814#1	EPA 300.0	mg/L	0.2	8.8
Total Organic Carbon	01/17/14 011714#1	EPA 9060M	mg/L	1.50	< 1.50 U

RL Analytical reporting limit
U Undetected at reported detection limit

MS/MSD RESULTS-CONVENTIONALS
XU34-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized
Reported: 01/28/14

Project: Walker Chevrolet
Event: 11008-004-12
Date Sampled: 01/10/14
Date Received: 01/10/14

Analyte	Method	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: XU34A	**Client ID: MW-1-011014**						
N-Nitrate	EPA 300.0	01/11/14	mg-N/L	0.2	2.1	2.0	95.0%
N-Nitrite	EPA 300.0	01/11/14	mg-N/L	< 0.1	2.0	2.0	100.0%
Sulfate	EPA 300.0	01/18/14	mg/L	8.8	18.0	10.0	92.0%

REPLICATE RESULTS-CONVENTIONALS
XU34-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 01/28/14

Project: Walker Chevrolet
Event: 11008-004-12
Date Sampled: 01/10/14
Date Received: 01/10/14

Analyte	Method	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: XU34A	**Client ID: MW-1-011014**					
N-Nitrate	EPA 300.0	01/11/14	mg-N/L	0.2	0.2	0.0%
N-Nitrite	EPA 300.0	01/11/14	mg-N/L	< 0.1	< 0.1	NA
Sulfate	EPA 300.0	01/18/14	mg/L	8.8	8.8	0.0%

METHOD BLANK RESULTS-CONVENTIONALS
XU34-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 01/28/14

Project: Walker Chevrolet
Event: 11008-004-12
Date Sampled: NA
Date Received: NA

Analyte	Method	Date	Units	Blank	ID
N-Nitrate	EPA 300.0	01/11/14	mg-N/L	< 0.1 U	
N-Nitrite	EPA 300.0	01/11/14	mg-N/L	< 0.1 U	
Sulfate	EPA 300.0	01/18/14	mg/L	< 0.1 U	
Total Organic Carbon	EPA 9060M	01/17/14	mg/L	< 1.50 U	

STANDARD REFERENCE RESULTS-CONVENTIONALS
XU34-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 01/28/14

Project: Walker Chevrolet
Event: 11008-004-12
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Method	Date	Units	SRM	True Value	Recovery
N-Nitrate ERA #220912	EPA 300.0	01/11/14	mg-N/L	2.9	3.0	96.7%
N-Nitrite ERA 490412	EPA 300.0	01/11/14	mg-N/L	3.0	3.0	100.0%
Sulfate ERA 240312	EPA 300.0	01/18/14	mg/L	2.9	3.0	96.7%
Total Organic Carbon ERA #0408-13-02	EPA 9060M	01/17/14	mg/L	19.6	20.0	98.0%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

January 30, 2014

Alan Noell
Aspect Consulting
401 - 2nd Avenue, Suite 201
Seattle, WA 98104

RE: Walker Chevrolet, 080190
ARI Job: XU35

Dear Alan:

Please find enclosed the Chain of Custody record (COC), sample receipt documentation, and the final results for samples from the project referenced above. Analytical Resources, Inc. accepted three water samples on January 10, 2014. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form.

The samples were analyzed for VOCs, PAHs, PCBs, total metals, and various conventional parameters, as requested.

The matrix spike percent recovery of iron was outside the control limits high for sample **MW-5-010914**. All relevant data have been flagged with an "N" qualifier on the Form V. No further corrective action was taken.

The duplicate RPD of iron was outside the control limit for sample **MW-5-010914**. All relevant data have been flagged with a "*" qualifier on the Form VI. No further corrective action was taken.

Sample **MW-5-010914** was initially analyzed within the method recommended holding time of forty-eight hours for nitrate and nitrite. Due to failing closing calibrations, the sample was re-analyzed outside the method recommended holing time. Only the re-analysis results for nitrate and nitrite have been reported. No further corrective action was taken.

An electronic copy of this report as well as all supporting raw data will remain on file with ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager
(206) 695-6214
cheronneo@arilabs.com

cc: eFile XU35

Enclosures

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

ARI Assigned Number: XU35	Turn-around Requested:
ARI Client Company: Aspect Consulting	Phone: (206) 838-6592
Client Contact: Alan Noell	
Client Project Name: Walker Chevrolet	
Client Project #: 080190	Samplers: JLO

Page: 1 of 1	
Date: 1/10/14	Ice Present? Y
No. of Coolers: 1	Cooler Temps: 5.6

Sample ID	Date	Time	Matrix	No Containers	Volatiles (8260)	PAHs (8270)	PCBs (8082)	[illegible] (300.8)	NO3, NO2, SO4 (300)	TOC (415.1)	Pb (200.8)		Notes/Comments
MW-5-010914	1/9/14	09:30	water	10	X	X	X	X	X	X	X		
MW-8D-011014	1/10/14	11:15	water	7	X			X	X	X			
MW-12D-011014	1/10/14	14:50	water	4	X								

Comments/Special Instructions

	Relinquished by	Received by	Relinquished by	Received by
(Signature)	[signature]	[signature]		
Printed Name	Judy Oleson	Jennifer Millsap		
Company	Aspect Cons.	ARI		
Date & Time	1/10/14 17:45	1/10/14 1745		

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Aspect

COC No(s): ____ NA

Assigned ARI Job No: XU35

Project Name: Walker Chevrolet

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: ____

Tracking No. ____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 5.6
Time 1743

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID# 90877952

Cooler Accepted by: JM Date 1/10/14 Time: 1745

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: ____			
Was sufficient ice used (if appropriate)?	NA	YES	NO
Were all bottles sealed in individual plastic bags?		YES	NO
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA		____

Was Sample Split by ARI : NA YES Date/Time: ____ Equipment: ____ Split by: ____

Samples Logged by JM Date: 1/13/14 Time: 743

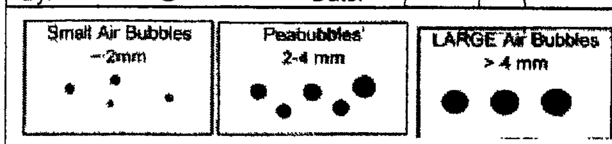
***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

TOC was collected in a HDPE bottle

By: JM Date: 1/13/14



Small → "sm"	(< 2 mm)
Peabubbles → "pb"	(2 to < 4 mm)
Large → "lg"	(4 to < 6 mm)
Headspace → "hs"	(> 6 mm)

PRESERVATION VERIFICATION 01/13/14
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **XU35**

Inquiry Number: NONE
Analysis Requested: 01/13/14
Contact: Noell, Alan
Client: Aspect Consulting
Logged by: JM
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Mark
VTSR: 01/10/14

Project #: 080190
Project: Walker Chevrolet
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
14-697 **XU35A**	MW-5-010914						TOT pass					fail						TOC	<2		2ml	1-13-14
14-698 **XU35B**	MW-8D-011014						TOT pass					fail									H_2SO_4 9N	w

Samples arrived in lab unpreserved 1-13-14 w

Checked By JM Date 1/13/14

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: XU35
Client: Aspect Consulting
Project Event: 080190
Project Name: Walker Chevrolet

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-5-010914	XU35A	14-697	Water	01/09/14 09:30	01/10/14 17:45
2.	MW-8D-011014	XU35B	14-698	Water	01/10/14 11:15	01/10/14 17:45
3.	MW-12D-011014	XU35C	14-699	Water	01/10/14 14:50	01/10/14 17:45

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MW-5-010914**
Page 1 of 2 **SAMPLE**

Lab Sample ID: XU35A
LIMS ID: 14-697
Matrix: Water
Data Release Authorized:
Reported: 01/16/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: 01/09/14
Date Received: 01/10/14

Instrument/Analyst: NT2/LH
Date Analyzed: 01/15/14 18:29

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.20	< 0.20	U
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
67-66-3	**Chloroform**	**0.20**	**0.35**	
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	**Trichloroethene**	**0.20**	**0.46**	
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MW-5-010914**

SAMPLE

Lab Sample ID: XU35A
LIMS ID: 14-697
Matrix: Water
Date Analyzed: 01/15/14 18:29

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	101%
d8-Toluene	103%
Bromofluorobenzene	97.7%
d4-1,2-Dichlorobenzene	102%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MW-8D-011014**
Page 1 of 2 **SAMPLE**

Lab Sample ID: XU35B
LIMS ID: 14-698
Matrix: Water
Data Release Authorized: MW
Reported: 01/16/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: 01/10/14
Date Received: 01/10/14

Instrument/Analyst: NT2/LH
Date Analyzed: 01/15/14 18:56

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.20	< 0.20	U
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	**cis-1,2-Dichloroethene**	**0.20**	**42**	
67-66-3	**Chloroform**	**0.20**	**0.68**	
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	**Carbon Tetrachloride**	**0.20**	**1.7**	
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MW-8D-011014**
 SAMPLE

Lab Sample ID: XU35B QC Report No: XU35-Aspect Consulting
LIMS ID: 14-698 Project: Walker Chevrolet
Matrix: Water 080190
Date Analyzed: 01/15/14 18:56

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	**Naphthalene**	**0.50**	**0.80**	
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	100%
d8-Toluene	98.2%
Bromofluorobenzene	98.4%
d4-1,2-Dichlorobenzene	99.7%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MW-12D-011014**
 SAMPLE

Lab Sample ID: XU35C
LIMS ID: 14-699
Matrix: Water
Data Release Authorized:
Reported: 01/16/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: 01/10/14
Date Received: 01/10/14

Instrument/Analyst: NT2/LH
Date Analyzed: 01/15/14 19:23

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.20	< 0.20	U
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	**cis-1,2-Dichloroethene**	**0.20**	**22**	
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	**Trichloroethene**	**0.20**	**0.34**	
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	**Tetrachloroethene**	**0.20**	**0.70**	
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MW-12D-011014**
 SAMPLE

Lab Sample ID: XU35C
LIMS ID: 14-699
Matrix: Water
Date Analyzed: 01/15/14 19:23

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	101%
Bromofluorobenzene	94.7%
d4-1,2-Dichlorobenzene	98.6%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-011514A	Method Blank	10	102%	102%	102%	99.4%	0
LCS-011514A	Lab Control	10	101%	101%	102%	96.5%	0
LCSD-011514A	Lab Control Dup	10	103%	102%	102%	103%	0
XU35A	MW-5-010914	10	101%	103%	97.7%	102%	0
XU35B	MW-8D-011014	10	100%	98.2%	98.4%	99.7%	0
XU35C	MW-12D-011014	10	103%	101%	94.7%	98.6%	0

SW8260C	LCS/MB LIMITS	QC LIMITS
(DCE) = d4-1,2-Dichloroethane	(80-120)	(80-130)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 14-697 to 14-699

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-011514A**

LAB CONTROL SAMPLE

Lab Sample ID: LCS-011514A
LIMS ID: 14-697
Matrix: Water
Data Release Authorized: MW
Reported: 01/16/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT2/LH
LCSD: NT2/LH
Date Analyzed LCS: 01/15/14 09:58
LCSD: 01/15/14 10:25

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	10.9	10.0	109%	10.7	10.0	107%	1.9%
Bromomethane	10.8	10.0	108%	10.7	10.0	107%	0.9%
Vinyl Chloride	9.88	10.0	98.8%	10.1	10.0	101%	2.2%
Chloroethane	10.4	10.0	104%	10.4	10.0	104%	0.0%
Methylene Chloride	9.77	10.0	97.7%	9.96	10.0	99.6%	1.9%
Acetone	52.0	50.0	104%	51.5	50.0	103%	1.0%
Carbon Disulfide	9.87	10.0	98.7%	9.79	10.0	97.9%	0.8%
1,1-Dichloroethene	10.0	10.0	100%	9.96	10.0	99.6%	0.4%
1,1-Dichloroethane	10.3	10.0	103%	10.4	10.0	104%	1.0%
trans-1,2-Dichloroethene	9.70	10.0	97.0%	9.87	10.0	98.7%	1.7%
cis-1,2-Dichloroethene	9.29	10.0	92.9%	9.35	10.0	93.5%	0.6%
Chloroform	10.0	10.0	100%	10.1	10.0	101%	1.0%
1,2-Dichloroethane	10.2	10.0	102%	10.2	10.0	102%	0.0%
2-Butanone	48.6	50.0	97.2%	49.2	50.0	98.4%	1.2%
1,1,1-Trichloroethane	9.91	10.0	99.1%	9.94	10.0	99.4%	0.3%
Carbon Tetrachloride	10.8	10.0	108%	10.9	10.0	109%	0.9%
Vinyl Acetate	9.74	10.0	97.4%	9.77	10.0	97.7%	0.3%
Bromodichloromethane	10.7	10.0	107%	10.6	10.0	106%	0.9%
1,2-Dichloropropane	10.7	10.0	107%	10.8	10.0	108%	0.9%
cis-1,3-Dichloropropene	9.72	10.0	97.2%	9.72	10.0	97.2%	0.0%
Trichloroethene	10.6	10.0	106%	10.4	10.0	104%	1.9%
Dibromochloromethane	10.2	10.0	102%	10.3	10.0	103%	1.0%
1,1,2-Trichloroethane	9.76	10.0	97.6%	9.80	10.0	98.0%	0.4%
Benzene	9.91	10.0	99.1%	9.81	10.0	98.1%	1.0%
trans-1,3-Dichloropropene	9.94	10.0	99.4%	10.3	10.0	103%	3.6%
2-Chloroethylvinylether	9.82	10.0	98.2%	9.82	10.0	98.2%	0.0%
Bromoform	10.6	10.0	106%	11.0	10.0	110%	3.7%
4-Methyl-2-Pentanone (MIBK)	52.2	50.0	104%	51.8	50.0	104%	0.8%
2-Hexanone	49.8	50.0	99.6%	50.5	50.0	101%	1.4%
Tetrachloroethene	10.5	10.0	105%	10.4	10.0	104%	1.0%
1,1,2,2-Tetrachloroethane	9.61	10.0	96.1%	9.18	10.0	91.8%	4.6%
Toluene	9.73	10.0	97.3%	9.85	10.0	98.5%	1.2%
Chlorobenzene	9.91	10.0	99.1%	10.1	10.0	101%	1.9%
Ethylbenzene	10.1	10.0	101%	9.96	10.0	99.6%	1.4%
Styrene	10.2	10.0	102%	10.6	10.0	106%	3.8%
Trichlorofluoromethane	10.5	10.0	105%	10.4	10.0	104%	1.0%
1,1,2-Trichloro-1,2,2-trifluoroetha	10.4	10.0	104%	10.4	10.0	104%	0.0%
m,p-Xylene	20.1	20.0	100%	20.3	20.0	102%	1.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-011514A**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-011514A QC Report No: XU35-Aspect Consulting
LIMS ID: 14-697 Project: Walker Chevrolet
Matrix: Water 080190

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
o-Xylene	10.0	10.0	100%	10.1	10.0	101%	1.0%
1,2-Dichlorobenzene	9.46	10.0	94.6%	9.25	10.0	92.5%	2.2%
1,3-Dichlorobenzene	9.55	10.0	95.5%	9.61	10.0	96.1%	0.6%
1,4-Dichlorobenzene	9.31	10.0	93.1%	9.33	10.0	93.3%	0.2%
Acrolein	46.3	50.0	92.6%	44.4	50.0	88.8%	4.2%
Iodomethane	10.2	10.0	102%	10.3	10.0	103%	1.0%
Bromoethane	10.2	10.0	102%	10.1	10.0	101%	1.0%
Acrylonitrile	9.61	10.0	96.1%	10.0	10.0	100%	4.0%
1,1-Dichloropropene	9.99	10.0	99.9%	9.77	10.0	97.7%	2.2%
Dibromomethane	9.59	10.0	95.9%	10.0	10.0	100%	4.2%
1,1,1,2-Tetrachloroethane	10.5	10.0	105%	11.3	10.0	113%	7.3%
1,2-Dibromo-3-chloropropane	8.71	10.0	87.1%	8.34	10.0	83.4%	4.3%
1,2,3-Trichloropropane	9.26	10.0	92.6%	9.29	10.0	92.9%	0.3%
trans-1,4-Dichloro-2-butene	9.44	10.0	94.4%	9.79	10.0	97.9%	3.6%
1,3,5-Trimethylbenzene	9.92	10.0	99.2%	9.64	10.0	96.4%	2.9%
1,2,4-Trimethylbenzene	9.79	10.0	97.9%	9.74	10.0	97.4%	0.5%
Hexachlorobutadiene	8.97	10.0	89.7%	9.14	10.0	91.4%	1.9%
1,2-Dibromoethane	10.2	10.0	102%	10.2	10.0	102%	0.0%
Bromochloromethane	9.88	10.0	98.8%	10.2	10.0	102%	3.2%
2,2-Dichloropropane	10.3	10.0	103%	10.1	10.0	101%	2.0%
1,3-Dichloropropane	9.51	10.0	95.1%	9.95	10.0	99.5%	4.5%
Isopropylbenzene	9.41	10.0	94.1%	9.53	10.0	95.3%	1.3%
n-Propylbenzene	9.59	10.0	95.9%	9.70	10.0	97.0%	1.1%
Bromobenzene	9.60	10.0	96.0%	9.69	10.0	96.9%	0.9%
2-Chlorotoluene	9.44	10.0	94.4%	9.37	10.0	93.7%	0.7%
4-Chlorotoluene	9.23	10.0	92.3%	9.45	10.0	94.5%	2.4%
tert-Butylbenzene	9.87	10.0	98.7%	9.79	10.0	97.9%	0.8%
sec-Butylbenzene	9.70	10.0	97.0%	9.71	10.0	97.1%	0.1%
4-Isopropyltoluene	9.58	10.0	95.8%	9.64	10.0	96.4%	0.6%
n-Butylbenzene	9.41	10.0	94.1%	9.19	10.0	91.9%	2.4%
1,2,4-Trichlorobenzene	9.94	10.0	99.4%	9.86	10.0	98.6%	0.8%
Naphthalene	9.96	10.0	99.6%	9.71	10.0	97.1%	2.5%
1,2,3-Trichlorobenzene	9.72	10.0	97.2%	9.66	10.0	96.6%	0.6%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	101%	103%
d8-Toluene	101%	102%
Bromofluorobenzene	102%	102%
d4-1,2-Dichlorobenzene	96.5%	103%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-011514A**

METHOD BLANK

Lab Sample ID: MB-011514A
LIMS ID: 14-697
Matrix: Water
Data Release Authorized: MW
Reported: 01/16/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT2/LH
Date Analyzed: 01/15/14 10:52

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.20	< 0.20	U
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: MB-011514A
METHOD BLANK

Lab Sample ID: MB-011514A
LIMS ID: 14-697
Matrix: Water
Date Analyzed: 01/15/14 10:52

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	102%
d8-Toluene	102%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	99.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C

Sample ID: MW-5-010914
SAMPLE

Lab Sample ID: XU35A
LIMS ID: 14-697
Matrix: Water
Data Release Authorized:
Reported: 01/17/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
Event: 080190
Date Sampled: 01/09/14
Date Received: 01/10/14

Date Extracted: 01/15/14
Date Analyzed: 01/17/14 13:11
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**0.10**	**0.14**
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Fluoranthene	71.7%
d10-2-Methylnaphthalene	53.0%
d14-Dibenzo(a,h)anthracene	39.3%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190

Client ID	FLN	MNP	DBA	TOT OUT
MB-011514	74.0%	57.7%	43.7%	0
LCS-011514	78.0%	63.7%	60.3%	0
LCSD-011514	72.0%	59.7%	43.3%	0
MW-5-010914	71.7%	53.0%	39.3%	0

	LCS/MB LIMITS	QC LIMITS
(FLN) = d10-Fluoranthene	(52-125)	(46-121)
(MNP) = d10-2-Methylnaphthalene	(37-120)	(31-120)
(DBA) = d14-Dibenzo(a,h)anthracene	(16-132)	(10-125)

Prep Method: SW3520C
Log Number Range: 14-697 to 14-697

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LCS-011514
LAB CONTROL SAMPLE

Lab Sample ID: LCS-011514
LIMS ID: 14-697
Matrix: Water
Data Release Authorized:
Reported: 01/17/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
Event: 080190
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 01/15/14

Sample Amount LCS: 500 mL
LCSD: 500 mL

Date Analyzed LCS: 01/17/14 11:48
LCSD: 01/17/14 12:15
Instrument/Analyst LCS: NT8/JZ
LCSD: NT8/JZ

Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	1.86	3.00	62.0%	1.77	3.00	59.0%	5.0%
2-Methylnaphthalene	1.77	3.00	59.0%	1.71	3.00	57.0%	3.4%
1-Methylnaphthalene	1.73	3.00	57.7%	1.66	3.00	55.3%	4.1%
Acenaphthylene	1.64	3.00	54.7%	1.58	3.00	52.7%	3.7%
Acenaphthene	1.82	3.00	60.7%	1.78	3.00	59.3%	2.2%
Fluorene	1.85	3.00	61.7%	1.83	3.00	61.0%	1.1%
Phenanthrene	2.01	3.00	67.0%	1.95	3.00	65.0%	3.0%
Anthracene	1.87	3.00	62.3%	1.72	3.00	57.3%	8.4%
Fluoranthene	2.18	3.00	72.7%	2.16	3.00	72.0%	0.9%
Pyrene	1.94	3.00	64.7%	1.87	3.00	62.3%	3.7%
Benzo(a)anthracene	1.97	3.00	65.7%	1.90	3.00	63.3%	3.6%
Chrysene	2.14	3.00	71.3%	2.06	3.00	68.7%	3.8%
Benzo(b)fluoranthene	2.15	3.00	71.7%	2.18	3.00	72.7%	1.4%
Benzo(k)fluoranthene	2.26	3.00	75.3%	2.31	3.00	77.0%	2.2%
Benzo(a)pyrene	1.85	3.00	61.7%	1.86	3.00	62.0%	0.5%
Indeno(1,2,3-cd)pyrene	2.05	3.00	68.3%	2.04	3.00	68.0%	0.5%
Dibenz(a,h)anthracene	1.79	3.00	59.7%	1.90	3.00	63.3%	6.0%
Benzo(g,h,i)perylene	2.07	3.00	69.0%	2.03	3.00	67.7%	2.0%
Dibenzofuran	1.90	3.00	63.3%	1.87	3.00	62.3%	1.6%
Total Benzofluoranthenes	6.49	9.00	72.1%	6.62	9.00	73.6%	2.0%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-Fluoranthene	78.0%	72.0%
d10-2-Methylnaphthalene	63.7%	59.7%
d14-Dibenzo(a,h)anthracene	60.3%	43.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: MB-011514
METHOD BLANK

Lab Sample ID: MB-011514
LIMS ID: 14-697
Matrix: Water
Data Release Authorized:
Reported: 01/17/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
Event: 080190
Date Sampled: NA
Date Received: NA

Date Extracted: 01/15/14
Date Analyzed: 01/17/14 10:52
Instrument/Analyst: NT8/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery	
d10-Fluoranthene	74.0%
d10-2-Methylnaphthalene	57.7%
d14-Dibenzo(a,h)anthracene	43.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C
Page 1 of 1

Sample ID: MW-5-010914
SAMPLE

Lab Sample ID: XU35A
LIMS ID: 14-697
Matrix: Water
Data Release Authorized:
Reported: 01/22/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: 01/09/14
Date Received: 01/10/14

Date Extracted: 01/15/14
Date Analyzed: 01/20/14 21:30
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 500 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
Acid Cleanup: Yes

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	0.10	< 0.10 U
53469-21-9	Aroclor 1242	0.10	< 0.10 U
12672-29-6	Aroclor 1248	0.10	< 0.10 U
11097-69-1	Aroclor 1254	0.10	< 0.10 U
11096-82-5	Aroclor 1260	0.10	< 0.10 U
11104-28-2	Aroclor 1221	0.10	< 0.10 U
11141-16-5	Aroclor 1232	0.10	< 0.10 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	56.5%
Tetrachlorometaxylene	58.2%

FORM I

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-011514	87.8%	39-116	61.0%	29-100	0
LCS-011514	87.5%	39-116	58.0%	29-100	0
LCSD-011514	86.2%	39-116	60.5%	29-100	0
MW-5-010914	56.5%	10-128	58.2%	25-100	0

Prep Method: SW3510C
Log Number Range: 14-697 to 14-697

FORM-II SW8082

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A

Sample ID: LCS-011514
LCS/LCSD

Lab Sample ID: LCS-011514
LIMS ID: 14-697
Matrix: Water
Data Release Authorized:
Reported: 01/22/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 01/15/14

Date Analyzed LCS: 01/20/14 20:30
LCSD: 01/20/14 20:50
Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR

GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: Yes
Acid Cleanup: Yes

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	0.685	1.00	68.5%	0.695	1.00	69.5%	1.4%
Aroclor 1260	0.846	1.00	84.6%	0.843	1.00	84.3%	0.4%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	87.5%	86.2%
Tetrachlorometaxylene	58.0%	60.5%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

FORM III

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C

Sample ID: MB-011514
METHOD BLANK

Lab Sample ID: MB-011514
LIMS ID: 14-697
Matrix: Water
Data Release Authorized:
Reported: 01/22/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: NA
Date Received: NA

Date Extracted: 01/15/14
Date Analyzed: 01/20/14 20:09
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 500 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Silica Gel: Yes
Acid Cleanup: Yes

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	0.10	< 0.10 U
53469-21-9	Aroclor 1242	0.10	< 0.10 U
12672-29-6	Aroclor 1248	0.10	< 0.10 U
11097-69-1	Aroclor 1254	0.10	< 0.10 U
11096-82-5	Aroclor 1260	0.10	< 0.10 U
11104-28-2	Aroclor 1221	0.10	< 0.10 U
11141-16-5	Aroclor 1232	0.10	< 0.10 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	87.8%
Tetrachlorometaxylene	61.0%

FORM I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: MW-5-010914
SAMPLE

Lab Sample ID: XU35A
LIMS ID: 14-697
Matrix: Water
Data Release Authorized
Reported: 01/21/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: 01/09/14
Date Received: 01/10/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	01/15/14	200.8	01/20/14	**7439-89-6**	**Iron**	100	**11,500**	
200.8	01/15/14	200.8	01/20/14	**7439-92-1**	**Lead**	0.1	**5.8**	

U-Analyte undetected at given RL
RL-Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: MW-8D-011014
SAMPLE

Lab Sample ID: XU35B
LIMS ID: 14-698
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: 01/10/14
Date Received: 01/10/14

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	01/15/14	200.8	01/20/14	**7439-89-6**	**Iron**	20	**790**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: MW-5-010914
MATRIX SPIKE

Lab Sample ID: XU35A
LIMS ID: 14-697
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: 01/09/14
Date Received: 01/10/14

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	**Analysis Method**	**Sample**	**Spike**	**Spike Added**	**% Recovery**	**Q**
Iron	200.8	11,500	24,300	5,000	256%	N
Lead	200.8	5.8	27.6	25.0	87.2%	

Reported in µg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked
NR-Not Recovered

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: MW-5-010914
DUPLICATE

Lab Sample ID: XU35A
LIMS ID: 14-697
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: 01/09/14
Date Received: 01/10/14

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Iron	200.8	11,500	20,800	57.6%	+/- 20%	*
Lead	200.8	5.8	6.7	14.4%	+/- 20%	

Reported in µg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: LAB CONTROL

Lab Sample ID: XU35LCS
LIMS ID: 14-697
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Iron	200.8	5000	5000	100%	
Lead	200.8	24.3	25.0	97.2%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: METHOD BLANK

Lab Sample ID: XU35MB
LIMS ID: 14-697
Matrix: Water
Data Release Authorized:
Reported: 01/21/14

QC Report No: XU35-Aspect Consulting
Project: Walker Chevrolet
080190
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	µg/L	Q
200.8	01/15/14	200.8	01/20/14	7439-89-6	Iron	20	20	U
200.8	01/15/14	200.8	01/20/14	7439-92-1	Lead	0.1	0.1	U

U-Analyte undetected at given RL
RL-Reporting Limit

SAMPLE RESULTS-CONVENTIONALS
XU35-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 01/28/14

Project: Walker Chevrolet
Event: 080190
Date Sampled: 01/09/14
Date Received: 01/10/14

Client ID: MW-5-010914
ARI ID: 14-697 XU35A

Analyte	Date Batch	Method	Units	RL	Sample
N-Nitrate	01/11/14 011114#1	EPA 300.0	mg-N/L	0.1	0.7
N-Nitrite	01/11/14 011114#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
Sulfate	01/18/14 011814#1	EPA 300.0	mg/L	0.5	20.6
Total Organic Carbon	01/17/14 011714#1	EPA 9060M	mg/L	1.50	< 1.50 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
XU35-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 01/28/14

Project: Walker Chevrolet
Event: 080190
Date Sampled: 01/10/14
Date Received: 01/10/14

Client ID: MW-8D-011014
ARI ID: 14-698 XU35B

Analyte	Date Batch	Method	Units	RL	Sample
N-Nitrate	01/11/14 011114#1	EPA 300.0	mg-N/L	0.1	1.6
N-Nitrite	01/11/14 011114#1	EPA 300.0	mg-N/L	0.1	< 0.1 U
Sulfate	01/18/14 011814#1	EPA 300.0	mg/L	1.0	22.8
Total Organic Carbon	01/17/14 011714#1	EPA 9060M	mg/L	1.50	< 1.50 U

RL Analytical reporting limit
U Undetected at reported detection limit

METHOD BLANK RESULTS-CONVENTIONALS
XU35-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 01/28/14

Project: Walker Chevrolet
Event: 080190
Date Sampled: NA
Date Received: NA

Analyte	**Method**	**Date**	**Units**	**Blank**	**ID**
N-Nitrate	EPA 300.0	01/11/14	mg-N/L	< 0.1 U	
N-Nitrite	EPA 300.0	01/11/14	mg-N/L	< 0.1 U	
Sulfate	EPA 300.0	01/18/14	mg/L	< 0.1 U	
Total Organic Carbon	EPA 9060M	01/17/14	mg/L	< 1.50 U	

STANDARD REFERENCE RESULTS-CONVENTIONALS
XU35-Aspect Consulting

ANALYTICAL RESOURCES INCORPORATED

Matrix: Water
Data Release Authorized:
Reported: 01/28/14

Project: Walker Chevrolet
Event: 080190
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Method	Date	Units	SRM	True Value	Recovery
N-Nitrate ERA #220912	EPA 300.0	01/11/14	mg-N/L	2.9	3.0	96.7%
N-Nitrite ERA 490412	EPA 300.0	01/11/14	mg-N/L	3.0	3.0	100.0%
Sulfate ERA 240312	EPA 300.0	01/18/14	mg/L	2.9	3.0	96.7%
Total Organic Carbon ERA #0408-13-02	EPA 9060M	01/17/14	mg/L	19.6	20.0	98.0%

SAMPLE CHAIN OF CUSTODY

Send Report To Alan Noell

Company Aspect Consulting

Address 401 2nd Ave. S, Ste. 201

City, State, ZIP Seattle, WA 98104

Phone # (206) 328-7443 Fax # (206) 838-5853

SAMPLERS (*signature*)

PROJECT NAME/NO. Walker Chevrolet

PO# 080190-004-11

REMARKS

Page # 1 of 1

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	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Volatiles (8260)	NO3, NO2, SO4 (300)	TOC (415.1)	Fe-total (200.8)			Notes
MW-13D-121613		12/16/13	15:45	water	4							X						
MW-8-121713		12/17/13	16:50	water	7							X	X	X	X			
MW-15-121713		12/17/13	15:20	water	7							X	X	X	X			
MW-15-121713-DUP		12/17/13	15:20	water	4							X						
MW-21-121713		12/17/13	14:20	water	7							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:	Judy Oleson	Aspect	12/18/13	15:15
Received by:				
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

SAMPLE CHAIN OF CUSTODY

Send Report To Alan Noell

Company Aspect Consulting

Address 401 2nd Ave S, Ste. 201

City, State, ZIP Seattle, WA 98104

Phone # 206-328-7443 Fax # 206-838-5853

SAMPLERS (*signature*)	
PROJECT NAME/NO.	PO#
Walker Chevrolet	080190-004-11
REMARKS	

Page # 1 of 1

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	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Volatiles (8260)	NO_3, NO_2, SO_4 (300)	TOC (415.1)	Fe-total (200.8)			Notes
MW-18-121213		12/12/13	11:55	water	7							X	X	X	X			
MW-2-121213		12/12/13	13:45	water	7							X	X	X	X			

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

FORMS\COC\COC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Judy Oleson	Aspect	12/13/13	10:23
Received by:				
Relinquished by:				
Received by:				