PES Environmental, Inc.
Engineering & Environmental Services

August 15, 2014

**1358.001.01**

Mr. Dale Myers
VCP Site Manager – Toxics Cleanup Program, NWRO
3190 160th Avenue SE
Bellevue, Washington 98008-5452

**SITE STATUS SUMMARY**
**MANHATTAN VILLAGE SHOPPING CENTER AND HARRIS PROPERTIES**
**VCP NO. NW1873**
**NORMANDY PARK, WASHINGTON**

Dear Mr. Myers:

PES Environmental, Inc. (PES) has prepared this letter on behalf of Manhattan Tenants In Common (Manhattan TIC) and the Harris Family, LTD (Harris Family) to summarize remedial investigations and cleanup actions conducted since 2009 at the Manhattan Village Shopping Center (MVSC) property located at 17835 First Avenue South (the "MVSC property") and the Harris property located at 17817 – 17825 First Avenue South in Normandy Park, Washington (the "Harris property"), collectively referred to as the "Property." The "Site" as used in this letter refers to the locations where contaminants originating from the Property have come to be located. The location and current features of the Property are shown on Figures 1 and 2.

This letter was prepared in response to the Washington State Department of Ecology (Ecology) letter, dated July 21, 2014, requesting information on the status of the Site (VCP Project No. NW1873). Ecology indicated that it was unaware of any remedial actions being conducted at the Site since May 2009. This letter includes a brief summary of the remedial investigations and cleanup actions conducted since May 2009, presents the current status of the Site, and presents the planned future cleanup actions. All referenced background documentation is included on the compact disc provided asAttachment A. A list of the documents and their assigned reference number (e.g. A1) is included at the beginning of Attachment A.

Environmental consulting services for the Site were provided by ERM-West, Inc. (ERM) until early 2013, when PES was jointly contracted by the property owners to provide environmental consulting services.

## SUMMARY OF WORK CONDUCTED SINCE MAY 2009

ERM's Final Data Gap Investigation Report (A1) presented a summary of work conducted through 2008 and is included for reference. The following work has been completed since 2009.

**SVE System Installation and Operation.** ERM designed, constructed, and operated a 10-well soil vapor extraction (SVE) system as an interim remedial action to address tetrachloroethene (PCE) in vadose zone soil along the sanitary sewer alignment and near the former septic system on the Harris property. ERM started up the SVE system in September 2009, and the SVE system

is currently operational. The SVE system is described in ERM's Final Soil Vapor Extraction Interim Remedial Action Design and Work Plan report (A2). ERM prepared monthly progress reports from October 2009 through September 2011 (not included).

**2010 Groundwater Sampling and 2011 Monitoring Well Installation and Sampling.** ERM conducted groundwater sampling in March, April, and November 2010. ERM also installed and sampled monitoring wells MW-10 and MW-11 in February 2011 to serve as performance monitoring wells for a pending in-situ chemical oxidation (ISCO) pilot test. The March and April 2010 results were documented in a semiannual groundwater monitoring report (A3), and the November 2010 and February 2011 results were documented in a groundwater sampling and well installation report (A5).

ERM also prepared a Final Site Remediation Progress Summary letter report (A4) which summarized the SVE system performance and included the most recent monthly O&M report, summarized the March 2010 groundwater monitoring activities and included the groundwater monitoring report, and presented the November 2010 groundwater monitoring data in a data table. The letter also referenced the pending ISCO pilot test.

**2011 ISCO Pilot Test.** ERM conducted an ISCO pilot test in April 2011 in the northwestern corner of the MVSC property and the southwestern corner of the Harris property. The pilot study included injecting 30,000 gallons of 2.5 percent potassium permanganate solution at 15 locations, and conducting three rounds of performance groundwater sampling over six months from May to October 2011. ERM reported that performance sampling indicated evidence of potassium permanganate in six of the 15 monitoring wells, and PCE concentrations initially decreased in these wells (DC-4, MW-4, KMW-2, DC-10B, DC-17, and MW-11). Based on the results in DC-17, ERM reported an influence of approximately 90 feet. PCE concentrations also decreased in MW-10 but evidence of potassium permanganate was not observed in this well. It was uncertain why MW-10 did not initially show evidence of potassium permanganate similar to downgradient DC-17. Later rounds of groundwater sampling indicated that three of the six wells returned to pre-pilot study concentrations (DC-4, KMW-2, and MW-4). Results of the pilot test and groundwater sampling were included in ERM's In Situ Chemical Oxidation Pilot Study Completion Report (A6) and in ERMS's Revised Feasibility Study report (A7).

Note: PES's file review and 2012 Property survey indicate that it is very likely that the results reported for monitoring well DC-17 were actually for monitoring well DC-5, and that the documented/observed ISCO pilot test influence would have been approximately 65 feet instead of 90 feet. In addition, the location of well MW-10 on the pilot study completion report map is inaccurate, and there is uncertainty regarding the data reported.

**2011 and 2012 Soil Investigations.** ERM drilled nine soil borings (SB-1 through SB-9) in April 2011, March 2012, and April 2012 to document the performance of the SVE system in areas where PCE-impacted soil above the MTCA Method A cleanup level [50 micrograms per kilogram (µg/kg)] had been observed prior to SVE system operation. Each of the borings were sampled at several depths in the vadose zone, and PCE was either not detected or was detected at concentrations well below the PCE cleanup level. Soil borings SB-1, SB-3 through SB-6, and SB-8 were installed along the sanitary sewer alignment; soil borings SB-2 and SB-7 were

installed near the former septic tank on the Harris property; and soil boring SB-9 was installed inside the Four Star Dry Cleaners building near the dry cleaning machine. The soil sample results were summarized on Figure 3 in the Revised Feasibility Study report (A7).

**2012 Monitoring Well Installation and Sampling.** ERM installed groundwater monitoring wells MW-12 through MW-15 in March 2012. Wells MW-12 and MW-13 were installed on the MVSC property, and MW-14 and MW-15 were installed on the Harris property. The wells were sampled in April 2012 as part of a full round of groundwater monitoring, and the analytical results are tabulated and summarized on an isoconcentration map (Figure 4) in the Revised Feasibility Study report (A7). Groundwater sampling results for monitoring wells MW-12 through MW-15 indicated concentrations of PCE were not detected.

**Revised Feasibility Study Report .** ERM's Revised Feasibility Study Report (A7) summarized the above activities and evaluated remedial alternatives. ERM selected source area air sparge/soil vapor extraction (AS/SVE) followed by site-wide ISCO using potassium permanganate. ERM proposed to install six AS wells within the source area and utilize the existing SVE wells. The alternative assumed that AS/SVE would be applied to the source zone until groundwater sampling demonstrated compliance with the site cleanup objectives or until no further decrease of PCE concentrations in groundwater was observed, and rebound did not occur after AS/SVE system shut down. ISCO was to be utilized if necessary in the source zone and in the downgradient portion of the plume once the source area was addressed.

**May 2013 Well Installation and Sampling.** PES installed monitoring well MW-16 and AS pilot test well AS-1 on May 16 and 17, 2013. MW-16 was installed to further delineate the extent of PCE impacted shallow groundwater northeast of MW-11 on the Harris Property. AS-1 was installed in the southwest portion of the Harris Property. Groundwater monitoring and sampling was conducted from May 28 through May 31, 2013. The results indicated similar and slightly lower PCE concentrations than the April 2012 data. The PCE concentration in newly installed well MW-16 was 2.5 micrograms per liter (µg/L), below the MTCA Method A cleanup level of 5 µg/L. These activities were documented in PES's Revised May 2013 Well Installation and Groundwater Monitoring Report (A10).

**Air Sparging Pilot Test.** PES conducted an air sparging pilot test on June 20, 2013 to determine the feasibility of air sparging to reduce concentrations of PCE in the saturated zone and to collect information for design of a full-scale air sparging system. The air sparging pilot test consisted of baseline monitoring of the injection test well AS-1 and four selected monitoring wells (DC-10A, MW-10, KMW-2, and MW-11), and a three-step air sparging test in AS-1 to assess the aquifer and vadose zone performance of the testing area under different flow rates and pressures.

Based on the results of the pilot test, air sparging appears to be feasible technology for the Site. PES estimates an effective radius of influence of 10 to 15 feet under the pilot test conditions. Observations of site conditions and review of historical data suggest that air sparging with soil vapor extraction is likely to remove additional adsorbed and dissolved phase PCE at the Site. The pilot test activities and results were summarized in PES's Air Sparging Pilot Test report (A9).

**SVE System Operation.** PES took over O&M of the SVE system in March 2013. PES conducts monthly site checks to ensure proper system operation, drain condensate, and record basic operating parameters and conducts quarterly O&M visits, which include field measurements and effluent stack samples for USEPA Method TO-15 analysis. PES prepared O&M Status reports (e-mails) to document O&M activities for the reporting period of March 2013 through August 2013 (A8) and September 2013 through March 2014 (A11). PES has been evaluating the SVE system operation and making adjustments to the individual SVE leg operating parameters. PES collected USEPA Method TO-15 samples of the individual SVE legs in November 2013. PCE removal rates range from 0.008 to 0.018 pounds per day and a total of approximately 95 pounds of PCE have been removed from September 2009 through March 2014. PES closed SVE legs SVE-5 through SVE-10 in February 2014 in order to evaluate rebound conditions in groundwater monitoring wells.

**April 2014 Limited Groundwater Sampling.** PES conducted a limited groundwater monitoring and sampling event in April 2014 to evaluate the effects on PCE concentrations in groundwater after temporarily shutting down SVE-5 through SVE-10. Groundwater samples were collected from wells MW-2, MW-15, DC-11, DC-12, DC-13, DC-20, and KMW-9. The April 2014 PCE concentrations were similar to the May 2013 data and potential rebound was not noted. The results are summarized in PES's Groundwater Monitoring – April 2014 letter report (A12).

## CURRENT SITE CONDITIONS

The majority of the Site has been thoroughly investigated, and the results adequately characterize the nature and extent of PCE impacts to soil and groundwater.

**Geologic Conditions.** Shallow soil across the Property generally consists of shallow silty sand from 0 to 10 feet below ground surface (bgs) and a well-sorted downward coarsening sand with varying amounts of silt and gravel to a depth of 46 to 56 feet bgs. Scattered silt and clay lenses are present at various depths from near surface to depths of approximately 32 feet bgs. A clay and silt unit has been encountered directly below the sand unit.

**Hydrogeologic Conditions.** Depth to groundwater is approximately 35 feet bgs on the Harris Property and 40 feet bgs on the MVSC property. The depth differences on the adjacent property are mainly due to differences in surface elevations. Groundwater flow direction has historically been toward the north with localized vectors ranging from north-northeast to north-northwest. Reported gradients on-Property have ranged from 0.004 to 0.006 feet/foot with gradients increasing significantly north of the Property (0.028 feet/foot). Reported hydraulic conductivities are between $1.3 \times 10^{-3}$ to $5.5 \times 10^{-2}$ centimeters per second (cm/s).

**Historical Releases and Investigations.** PCE has been detected in soil and groundwater at the Site, and available data indicate past releases of PCE from dry cleaning operations at the Four Star Dry Cleaners on MVSC property and from the former Manhattan Cleaners and Coin-Op Laundry on the Harris Property. Investigations indicated that PCE releases may have resulted in vadose zone soil impacts near the former septic systems at both properties, and the sanitary and possibly the storm sewer lines at the MVSC property. Groundwater impacts indicate PCE in

groundwater within the same areas as vadose zone impacts and that PCE impacts extend north of the Property to the Dunn Lumber property.

**Current Extent of Impacted Soil.** Residual PCE likely remains in the vadose zone near the Four Star Cleaners, along the sanitary and storm sewer alignment near the MVSC strip mall, and near the former septic tank on the Harris property. In locations near the dry cleaner and sewer alignments, residual PCE is likely to remain in shallow soil within the upper silty sand to sand unit (e.g., upper 10 feet) and within the scattered silt and clay lenses (e.g., upper 32 feet). In locations near the former septic tank on the Harris property, residual PCE may remain in the lower vadose zone.

**Current Extent of Impacted Groundwater.** PCE in groundwater contamination is predominantly within the first 5 to 10 feet below the water table. The PCE plume appears to be primarily sourced from the northwestern corner of the MVSC property and southwestern corner of the Harris property, where the PCE in groundwater concentrations are the highest. However, there also appears to be remaining PCE in groundwater sourced along the sanitary sewer alignment (and possibly the storm sewer alignment) to the south to the suspected location of the former septic system on the MVSC property.

**Current Remedial Action.** The SVE system installed in 2009 was designed to address residual PCE in soil that was discovered following decommissioning of the first SVE system. The existing SVE system has been operated since 2009 and has removed an additional 95 pounds of residual PCE mass. Groundwater PCE concentrations continue to decline. The eastern half of the existing SVE system was temporarily shut down in February 2014 to assess potential PCE rebound in nearby groundwater monitoring wells that have recently dropped below the MTCA Method A groundwater cleanup level (CUL). The April 2014 PCE concentrations were similar to the May 2013 data, and potential rebound was not noted.

The existing SVE system consists of 10 SVE wells (SVE-1 through SVE-10), a 5 horse-power (HP) rotary lobe blower, a moisture knockout, and a condensate storage tank. The SVE blower operates at approximately 240 to 280 standard cubic feet per minute (scfm), and when the entire well network is operating, each well is under approximately 3 to 7 inches of water column (in. w.c.) vacuum and generates between 18 to 26 scfm of vapor flow. PCE removal rates range from 0.008 to 0.018 pounds per day. Historical zone of influence (ZOI) has been observed at greater than 50 feet from the individual SVE wells. SVE well and discharge stack monitoring in November 2013 indicated that the SVE concentrations have declined significantly since 2010.

## REVISED REMEDIAL STRATEGY

Based on groundwater monitoring results showing PCE concentrations rebounding following the 2011 ISCO pilot test, PES recommended an expanded AS/SVE to treat shallow groundwater and vadose zone soil in the southwest corner of the Harris property and west of the sanitary sewer alignment on the MVSC property. This system will include an AS well network in shallow groundwater and a multi-depth level SVE well network in the vadose zone. The overall remediation objectives of the AS and SVE systems is to reduce the mass of PCE in residual source areas to below the soil and groundwater CULs. The engineering design basis and plans

for the proposed AS/SVE system are presented in PES's technical memorandum (A13). The plans specify the installation of an additional 30 AS wells (for a total of 31 AS wells) and an additional 12 SVE wells (for a total of 22 SVE wells).

The AS wells will be designed to target the sand and silty sand aquifer directly above a silt and clay layer, which has been encountered at depths of 46.5 to 50 feet bgs on the Harris property and 55 to 56 feet bgs on the MVSC property. The SVE wells will be installed at two depth intervals within the vadose zone. Shallow screened wells (5 to 20 feet bgs) will target the upper vadose zone, and deeper screened wells (20 to 30 feet bgs on Harris property and 20 to 35 feet bgs on MVSC property) will target the lower vadose zone. Both the vadose zone and the aquifer contain varying amounts of gravel, and the vadose zone contains scattered silt and clay lenses at various locations and depths from near surface to approximately 32 feet bgs.

Operation of the AS and expanded SVE system will continue until groundwater within the AS ZOI is at or below the MTCA Method A groundwater CUL (5 µg/L). The AS/SVE system is expected to operate for one to two years. Residual PCE concentrations in areas outside of the AS system influence will be allowed to naturally degrade. Routine performance monitoring and sampling will occur during system operation. When the AS/SVE system is shut down, groundwater will be monitored for potential rebound. After achieving four consecutive quarters of below CUL groundwater monitoring results on the Property, Ecology will be petitioned with a request for no further action (NFA) at the Site. The AS and SVE system will be decommissioned following Ecology approval.

If you have any questions regarding this report, or need any additional information, please feel free to contact either of us at (206) 529-3980.

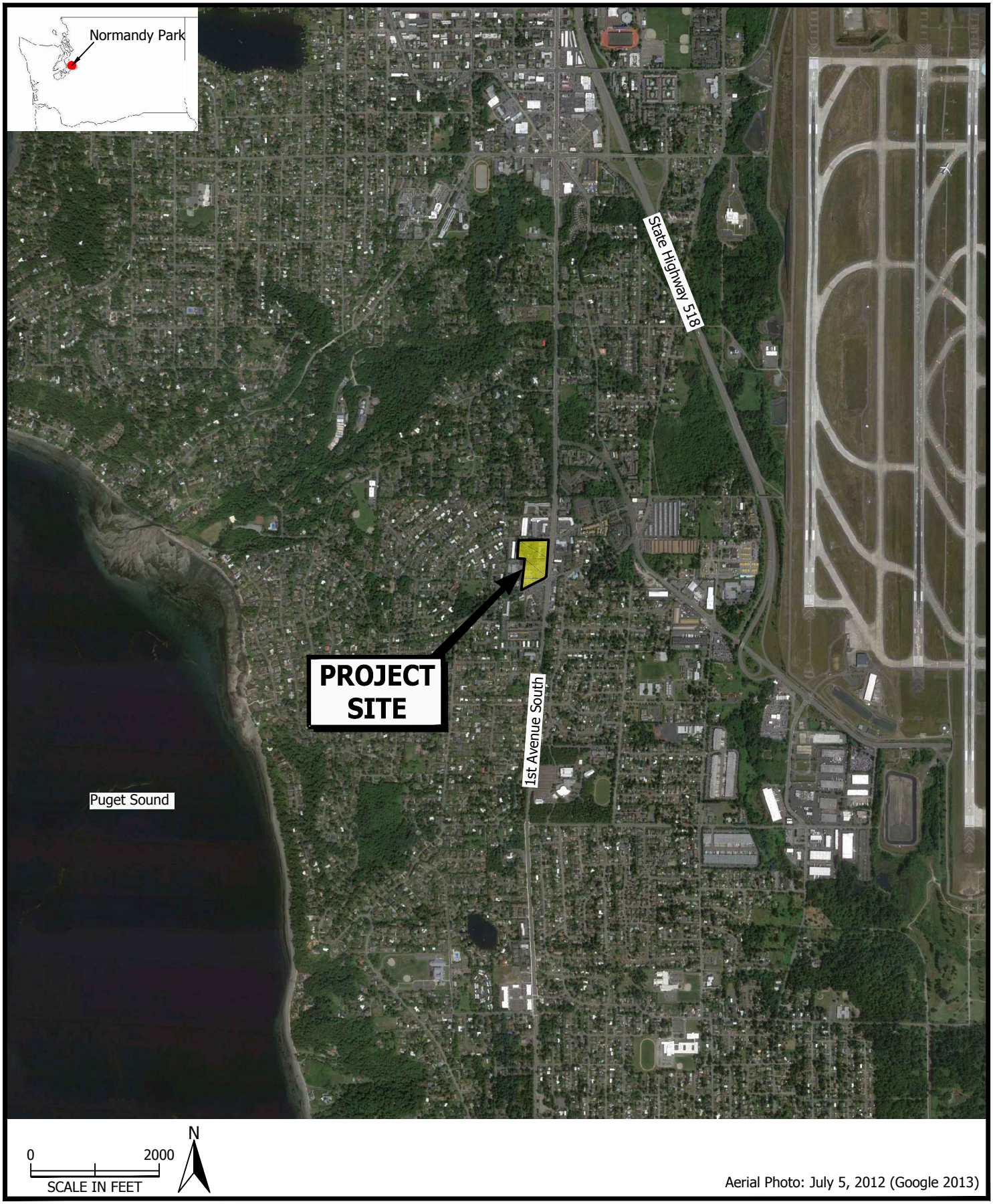
Sincerely,

**PES ENVIRONMENTAL, INC.**

for Matthew V. Dahl, P.E.
Senior Engineer

Attachments:
Figure 1 – Site Location Map
Figure 2 – Site Plan
Attachment A – Background Documents (on CD)

cc: Ms. Courtney Seim – Riddell Williams P.S.
Mr. Robert DiJulio – Wolfstone, Panchot & Bloch, P.S.




Aerial Photo: July 5, 2012 (Google 2013)

**PES Environmental, Inc.**
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**Site Location Map**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

FIGURE
1

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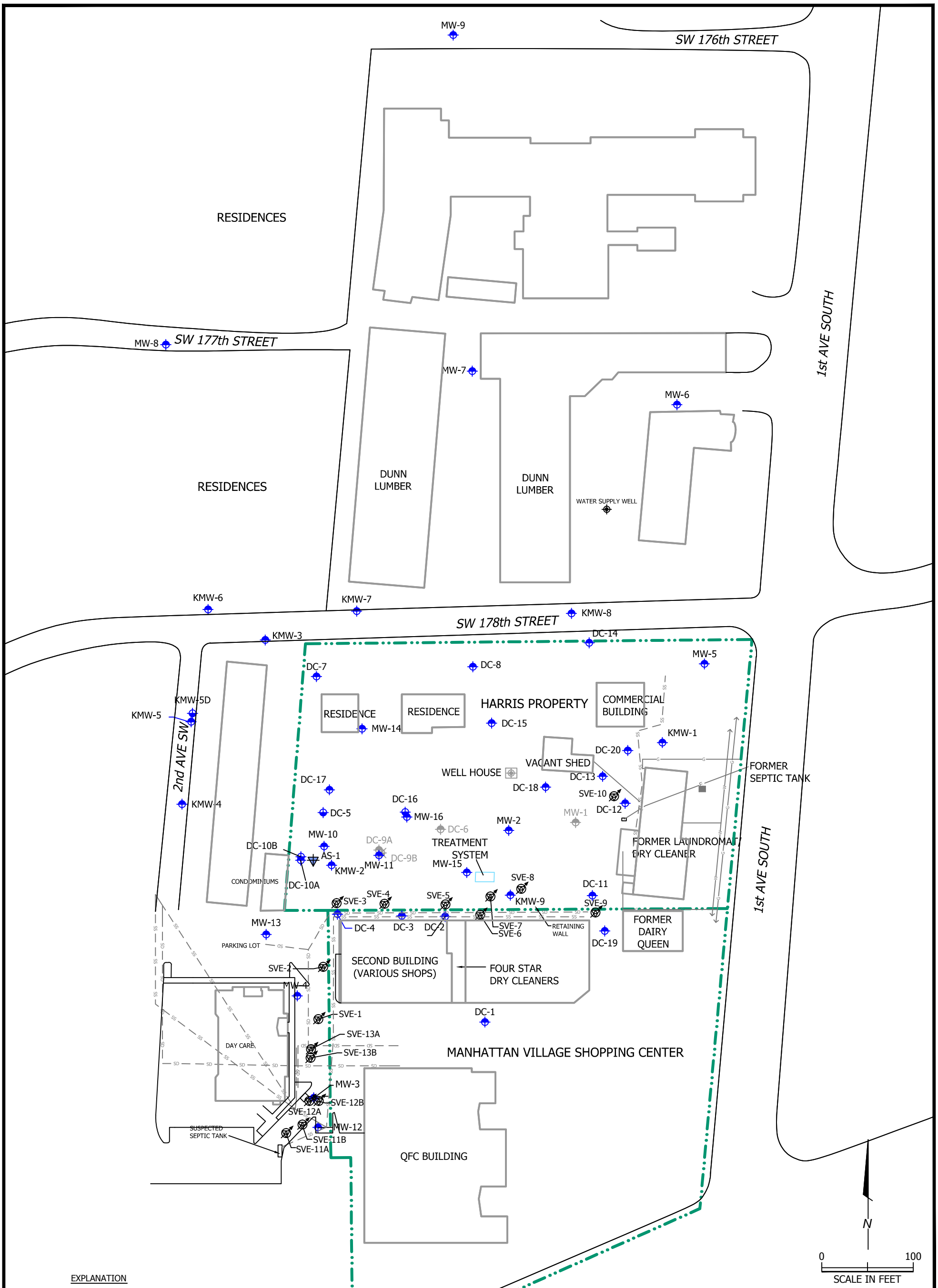


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**Site Map**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

FIGURE
2

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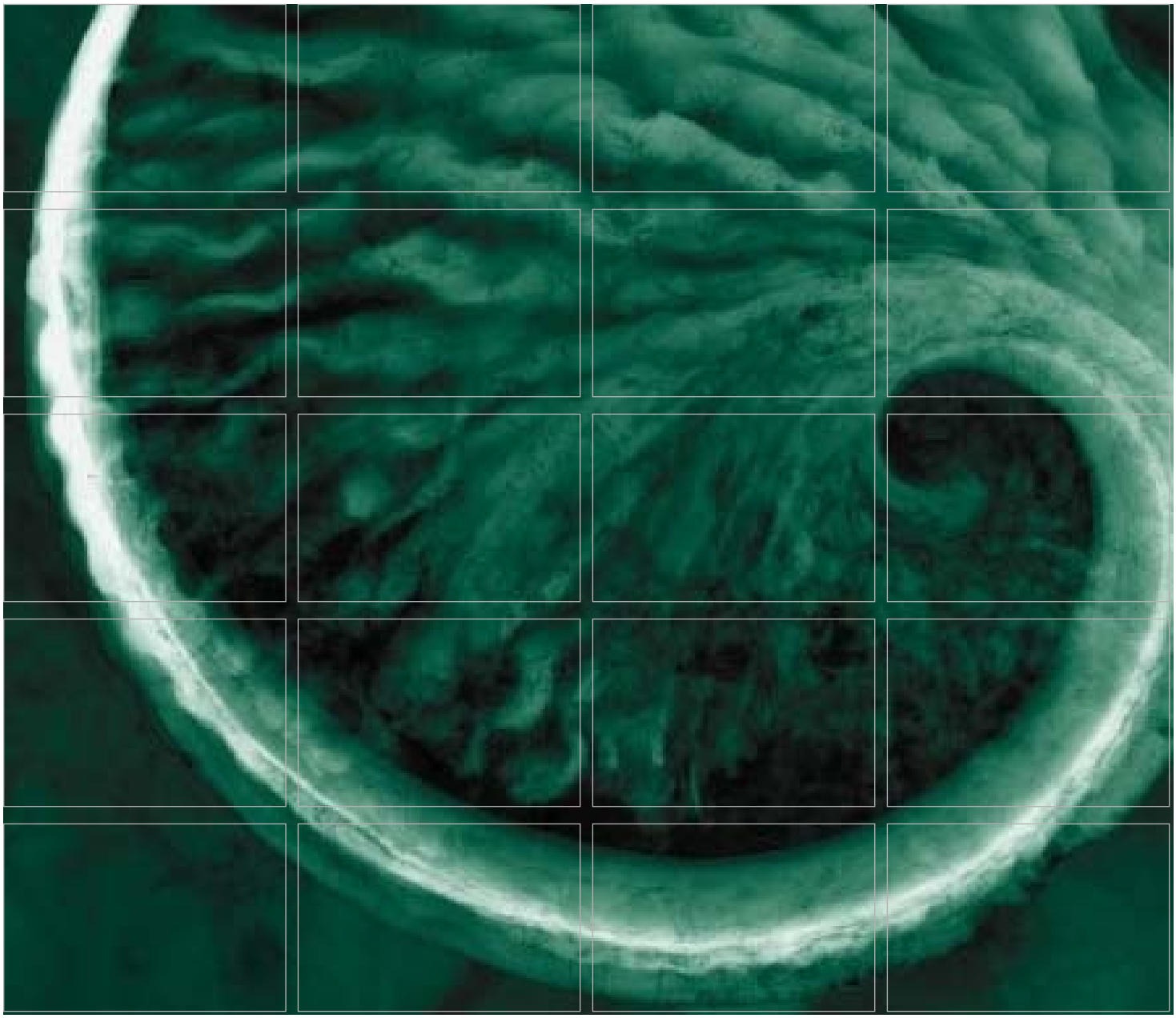
# ATTACHMENT A

# BACKGROUND DOCUMENTS (ON CD)

## ATTACHMENT A – LIST OF PREVIOUS REPORTS

| Appendix | Report Reference |
|---|---|
| A1 | ERM-West, Inc. (ERM). 2009. *Final Data Gap Investigation Report, Manhattan Village Shopping Center and Harris Properties, 17817-17825 and 17835 1st Avenue South, Normandy Park, Washington*. February. |
| A2 | ERM-West, Inc. (ERM). 2009. *Final Soil Vapor Extraction Interim Remedial Action Design Work Plan, Manhattan Village Shopping Center and Harris Properties, 17817-17825 and 17835 1st Avenue South, Normandy Park, Washington*. March. |
| A3 | ERM-West, Inc. (ERM). 2010. *2010 Semiannual Groundwater Monitoring Report, Harris/Manhattan Village Shopping Center, Normandy Park, Washington*. April 30. |
| A4 | ERM-West, Inc. (ERM). 2011. *Final Site Remediation Progress Summary, Harris/Manhattan Village Shopping Center, Normandy Park, Washington*. January 5. VCP# NW1873 |
| A5 | ERM-West, Inc. (ERM). 2011. *November 2010/February 2011 Groundwater Sampling Event and February 2011 Well Installation Report, Harris/Manhattan Village Shopping Center, Normandy Park, Washington*. March 25. |
| A6 | ERM-West, Inc. (ERM). 2012. *In Situ Chemical Oxidation Pilot Study Completion Report*. January 12. |
| A7 | ERM-West, Inc. (ERM). 2012. *Revised Feasibility Study, Manhattan Village Shopping Center and Harris Properties, 17817-17825 and 17835 1st Avenue South, Normandy Park, Washington*. September. |
| A8 | Letter to C. Seim from Dahl, Matt. *"Draft O&M Status Report – Manhattan Village and Harris Properties."* September 9, 2013. |
| A9 | PES Environmental, Inc. 2013. *Air Sparging Pilot Test, Manhattan Village Shopping Center and Harris Properties, Normandy Park, Washington*. October 2. |
| A10 | PES Environmental, Inc. 2013. *Revised May 2013 Well Installation and Groundwater Monitoring, Manhattan Village Shopping Center and Harris Properties, Normandy Park, Washington*. October 2. |
| A11 | Letter to C. Seim from Dahl, Matt. *"Draft O&M Status Report – Manhattan Village and Harris Properties: September 2013 through March 2014."* April 2, 2014. |
| A12 | PES Environmental, Inc. 2014. *Groundwater Monitoring – April 2014, Manhattan Village Shopping Center and Harris Properties, Normandy Park, Washington*. May 14. |
| A13 | PES Environmental, Inc. 2014. *FINAL Air Sparging and Soil Vapor Extraction Design, Manhattan Village Shopping Center and Harris Properties, Normandy Park, Washington*. July 7. |



# FINAL Data Gap Investigation Report

**Manhattan Village Shopping Center and Harris Properties**
**17817-17825 and 17835 1st Avenue South**
**Normandy Park, Washington**

February 2009

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*Delivering sustainable solutions in a more competitive world*

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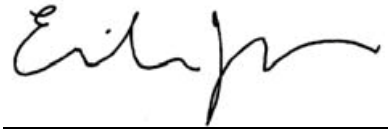
Riddell Williams P.S. and Wolfstone, Panchot & Bloch, P.S.

# FINAL Data Gap Investigation Report

*Manhattan Village Shopping Center and Harris Properties*
*17817-17825 and 17835 1st Avenue South*
*Normandy Park, Washington*

February 2009

Project Number: 0075720.02



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## *1.0 INTRODUCTION AND BACKGROUND*

This report presents the results of a Data Gap Investigation (DGI) completed by ERM-West, Inc. (ERM) at the Manhattan Village Shopping Center (MVSC) and Harris properties located at 17817-17825 and 17835 1st Avenue South in Normandy Park, Washington (collectively, the "Site"). A site location map is included as Figure 1. Soil and groundwater quality at both properties are impacted by releases of tetrachloroethene (PCE) from dry cleaning operations.

The DGI was conducted on behalf of the owners of both properties as described in ERM's *Revised Draft Data Gap Investigation Work Plan* dated 14 January 2008. The objective of the DGI was to complete site characterization efforts by supplementing existing project data with new, targeted field and laboratory data. The following gaps in site characterization data were identified by ERM as part of a review of available Site information:

- Current vertical and lateral extent of PCE and related volatile organic compounds (VOCs) [trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene, and vinyl chloride] in soil near the Four Star Dry Cleaners facility, along the utility corridor behind the Four Star Dry Cleaners facility, near the suspected former MVSC septic tank, and at suspected historic waste container locations on the Harris property (Figure 2);
- Current extent of PCE and related VOCs in groundwater in the source areas;
- Downgradient extent of PCE in groundwater; and
- Natural oxidant demand of the aquifer in the PCE-impacted area.

The DGI efforts were completed to both meet site characterization requirements of the Model Toxics Control Act (MTCA) Washington Administrative Code (WAC) Chapter 173-340-350 and to develop data appropriate to complete a remedial alternatives evaluation, or feasibility study.

This report is organized as follows:

- Section 1.0 presents an introduction that includes the project background, a Site description, a summary of previous investigations, and the project objectives;

- Section 2.0 summarizes ERM's investigation activities;
- Section 3.0 summarizes the investigation results;
- Section 4.0 presents the conclusions of the site investigation; and
- Section 5.0 includes references cited in this report.

## *1.1 SITE DESCRIPTION*

The MVSC and Harris properties are adjacent to the west of 1st Avenue South, as shown in Figure 2. The MVSC is approximately 4 acres in area and consists of four buildings connected by a paved parking area with scattered small landscaped areas. The address of the property is 17827 1st Avenue South. The southern building in the shopping center is a single-story QFC grocery store. To the east of the QFC there is a single-story structure currently used as a day care facility. North of the QFC is a strip mall that holds restaurants, retail shops, and a dry cleaning facility (Four Star Dry Cleaners). A building, currently unoccupied, is located east of the strip mall building and previously housed a Dairy Queen restaurant.

The Harris property includes six contiguous tax parcels with a total area of approximately 3.3 acres adjacent to the north of the MVSC property. The Harris property is occupied by two residential structures, two single-story commercial buildings, and a storage shed. The commercial properties are at addresses of 17801 and 17817 1st Avenue South, and the residential properties are at 137 and 145 Southwest 178th Street. Ground cover near the commercial buildings is mixed pavement and gravel, and the residences are surrounded by lawn and landscaped areas. Two of the tax lots (approximately 48,000 square feet) of the Harris property are undeveloped. Records indicate that a dry cleaning facility (Manhattan Cleaners and Coin-Op Laundry) previously operated in the commercial building in the southeast portion of the Harris property.

## *1.2 FINDINGS FROM OTHER INVESTIGATIONS*

Other environmental investigations at the Site were conducted between 1998 and 2008 by Aspect Consulting, Farallon Consulting, Kane Environmental Inc., and SCS Engineers. The information included in this section is a summary of the findings of those reports as pertinent to site characterization. A list of available reports for the Site is included in Appendix A. Data from these reports was used in conjunction with the

data developed during the DGI to develop the conclusions in Section 5.0 of this report.

Soils across the Site generally consist of a vadose zone of silt, interbedded silt and sand, and sand from the ground surface to groundwater, which is typically encountered at depths ranging from approximately 23 to 40 feet below ground surface (bgs). Saturated zone soils are primarily sand with some silt and gravel. Groundwater flow is generally toward the north across both properties.

Chlorinated VOCs have been detected in soil and groundwater at the Site. Subsurface PCE impacts have occurred as a result of historical releases of PCE (dry cleaning solvent) from dry cleaning operations at Four Star Dry Cleaners facility in the MVSC and from the former Manhattan Cleaners and Coin-Op Laundry on the Harris property. The locations of current Site features are shown on Figure 2. Multiple phases of investigation have been performed by the separate landowners to identify the nature and extent of the soil and groundwater impacts on their respective properties.

The results of previous investigations suggest that PCE releases have resulted in soil impacts characterized primarily by elevated PCE concentrations in the vadose zone in the vicinity of former septic systems at both properties, and sanitary and storm sewer lines at the MVSC property. PCE has been detected in vadose zone soils at both sites at concentrations greater than the Washington State MTCA Method A Cleanup Level of 50 micrograms per kilogram.

Groundwater sampling results indicate that dissolved PCE in groundwater is distributed from the vicinity of the Four Star Dry Cleaners facility and former sanitary sewer line, across the Harris property to the north, to the Dunn Lumber property north of the Harris property across Southwest 178$^{th}$ Street. Concentrations of dissolved PCE in groundwater samples collected from Site monitoring wells range from non-detect up to 63 micrograms per liter (µg/L) during the most recent comprehensive groundwater sampling completed in Spring 2007. The MTCA Method A Cleanup Level for PCE in groundwater is 5 µg/L. Prior to the completion of this DGI, the downgradient extent of the plume had not been identified, and PCE had been detected at a concentration of 10 µg/L in a groundwater sample collected in 2005 from a former water supply well at the Dunn Lumber property located immediately north of the Site.

## *1.3 PREVIOUS REMEDIATION ACTIVITIES*

Limited soil remediation by soil vapor extraction (SVE) was performed at the MVSC property in 1999. Results of this remediation indicate that the system recovered a significant mass of VOCs from Site soils. The period of SVE system operation correlates with a significant drop in subsequent groundwater concentrations across much of the Site, but available soil quality data collected prior to this DGI were not sufficient to evaluate the overall effectiveness of reduction of PCE concentrations in unsaturated soils across the entire PCE source area at MVSC.

The septic tanks that formerly served the building in which the former dry cleaner was housed on the Harris property were removed in 2006. PCE and related VOCs were detected in the sludge inside the tanks, as well as in soils near the tanks. Approximately 37 tons of soil and concrete were removed from the vicinity of the tanks and disposed. No VOCs were detected at concentrations greater than applicable MTCA cleanup levels in the excavation limit samples collected after soil removal activities were complete.

Soil investigation results from the MVSC property indicate that residual areas of PCE impacts persist in vadose zone soils in the vicinity of Four Star Dry Cleaners facility up to concentrations of several hundred milligrams per kilogram (mg/kg). The MTCA Method A soil cleanup level for PCE is 0.050 mg/kg. An area of PCE at concentrations ranging up to 0.10 mg/kg in vadose-zone soil detections of PCE above is also present in the eastern portion of the Harris property, near the area of a former septic tank (removed in 2006) that received waste from the former Manhattan Cleaners and Coin-Op Laundry on that property.

## *1.4 REGULATORY FRAMEWORK*

The MTCA regulation (WAC 173-340) applies to the discovery, investigation, and remediation of contaminated sites in Washington. The analytical results for soil and groundwater samples collected from the Site are compared to the MTCA Method A Cleanup Levels (WAC 173-340-900). MTCA Method A Cleanup Levels are conservative compliance standards for common contaminants at sites with relatively few hazardous substances present.

PCE was detected in soil samples, and several VOCs were detected in groundwater samples obtained during the March 2008 through August 2008 field investigation activities. Project screening levels were developed

for each detected compound based on applicable MTCA cleanup levels as summarized in the following table:

### *Project Screening Levels*

| Contaminant | Project Screening Level | Source |
|---|---|---|
| ***Soil*** | | |
| PCE | 0.05 milligrams per kilogram (mg/kg) | MTCA Method A[1] |
| ***Groundwater*** | | |
| Bromodichloromethane | 0.71 micrograms per liter (µg/L) | MTCA Method B[2] |
| Chloroform | 7.17 µg/L | MTCA Method B[2] |
| cis-1,2-Dichloroethene (cis-1,2-DCE ) | 80 µg/L | MTCA Method B[3] |
| PCE | 5 µg/L | MTCA Method A[4] |
| Trichloroethene (TCE) | 5 µg/L | MTCA Method A[4] |

**Notes:**
[1]MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (WAC 173-340-900, Table 740-1)
[2]MTCA Method B Groundwater Cleanup Level (Carcinogenic) (WAC 173-340-720)
[3]MTCA Method B Groundwater Cleanup Level (Noncarcinogenic) (WAC 173-340-720)
[4]MTCA Method A Cleanup Levels for Ground Water (WAC 173-340-900, Table 720-1)

## *2.0 FIELD INVESTIGATION PROGRAM*

The field investigation program was performed in accordance with the *Revised Draft Data Gap Investigation Work Plan*. The initial phase of field investigation activities was completed at the Site in March and April 2008. A second phase of field work was completed in August 2008 to complete the evaluation of the downgradient extent of PCE in groundwater. A summary of the two phases of fieldwork is provided below.

Field work completed in March and April 2008 included the following tasks:

- Completion of underground utility location and clearance at each drilling location;
- Collection and analysis of soil and groundwater samples from fourteen soil borings (B-5 through B-18);
- Installation of six soil vapor monitoring points in borings B-5, B-7, B-9, B-11, B-12, and B-13;
- Installation of five monitoring wells (MW-3 through MW-7); and
- Collection of a groundwater samples from 17 new and existing Site monitoring wells.

Field work completed in August 2008 included the following tasks:

- Completion of underground utility location and clearance at each drilling location;
- Installation of two groundwater monitoring wells (MW-8 and MW-9); and
- Collection of groundwater samples from the two new monitoring wells.

Additionally, three air samples were collected from the interior and exterior of a residence on the Harris property in May 2008. Investigation-derived waste generated during the field efforts was removed from the Site in October 2008 (see Section 2.7).

Laboratory sample analyses for VOCs, petroleum hydrocarbons, and metals were completed by TestAmerica of Bothell, Washington, and Lancaster Laboratories of Lancaster, Pennsylvania.

## 2.1 *UTILITY CLEARANCE*

Prior to beginning drilling operations, ERM identified the location of subsurface utilities in the drilling areas by contacting the regional public utility notification center, and by contracting a private utility locator. The public utility locators and the private utility locator, Applied Professional Services of North Bend, Washington, located and marked the underground utilities near the proposed drilling locations. Furthermore, all boring and monitoring well locations were excavated using a vacuum truck and air knife to at least 5 feet bgs prior to drilling.

## 2.2 *SOIL BORINGS*

Soil borings B-5 through B-18 were completed at the locations shown in Figure 2 using a direct-push drilling rig operated by Cascade Drilling, Inc., of Woodinville, Washington. The rationale for the completion of each boring is as follows:

- Borings B-5 and B-6 were completed to evaluate the current soil conditions in the vicinity of the suspected former septic tank at the MVSC property. Elevated PCE and cis-1,2-DCE concentrations were identified in this area during initial site investigation efforts in 1998 to 1999, but it was unclear whether these contaminants persist at concentrations greater than applicable cleanup standards in this area.
- Borings B-7 through B-15 were completed to evaluate the current vertical and lateral extent of soil impacts in the vicinity of the former sewer line from the Four Star Dry Cleaners facility. Insufficient data were available to evaluate whether SVE activities in 2000 and 2001 were successful at reducing PCE concentrations in this area to less than applicable cleanup standards. The lateral extent of the PCE impacts were unclear, especially in the vicinity of the day care facility southwest of the release area.
- Boring B-16 was completed to evaluate the potential for impacts related to the potential disposal of dry-cleaning wastes in a possible waste container visible in an aerial photograph of the Harris property taken during the period of the former dry cleaning facility operation between approximately 1965 and 1975.
- Borings B-17 and B-18 were completed to evaluate downgradient distribution of dissolved PCE in groundwater.

Continuous soil samples for lithologic logging and field screening were collected from ground surface to the total depth of the borings, which

ranged from 24 to 40 feet bgs. Soil samples were collected and recovered using a 4-foot-long drive tube with an acetate liner. At each boring, an ERM geologist completed field screening, collected required samples for laboratory analysis, and recorded the soil description on a boring log. Field screening of soil samples included visual observation for evidence of contamination and measurement of volatile organic vapors using a photoionization detector (PID). For volatile organic vapor screening, each soil sample was placed in a sealable plastic bag. After approximately 10 minutes, the side of the bag was pierced using the PID probe and the PID response in parts per million was recorded on the boring logs for each screened sample. Results of lithologic logging and field screening are recorded on the boring logs included in Appendix B.

### *2.2.1 Soil Sample Collection*

Three soil samples were collected from the vadose zone in borings B-5 through B-17. A summary of the depths at which each sample was collected is included in Table 1. Each soil sample was collected into a 40 milliliter glass vial using United States Environmental Protection Agency (USEPA) Method 5035A and was analyzed for VOCs by USEPA Method 8260B.

### *2.2.2 Groundwater Sample Collection*

Groundwater screening samples were collected from borings B-5, B-8, B-16, B-17, and B-18 through a temporary retractable stainless steel sampling screen installed using the direct-push rig. Groundwater samples were collected from each sampled boring using a bailer and were placed into laboratory supplied 40 milliliter glass VOA containers. The samples were analyzed for VOCs by USEPA Method 8260B.

### *2.2.3 Soil Vapor Probe Installation*

Soil vapor probes were installed in borings B-5, B-7, B-9, B-11, B-12, and B-13 for future use during planned remedial actions. The locations of the soil vapor monitoring points are shown on Figure 2. The soil vapor monitoring points were constructed using ¾-inch diameter pre-packed wells with 5 feet of screen installed to a depth of approximately 15 feet with a screened interval from 10 to 15 feet bgs. Flush-with-grade protective casings were installed at each probe location. Vapor probe construction details are included in Table 2.

## *2.3 MONITORING WELL INSTALLATION*

Seven monitoring wells (MW-3 through MW-9) were installed in borings completed to depths ranging from 44 to 55 feet bgs between 8 and 10 April 2008 and on 18 August 2008. Each well was installed using a hollow-stem auger rotary drilling rig operated by Cascade Drilling, Inc., of Woodinville, Washington. The rationale for installation of each well is as follows:

- Wells MW-3 and MW-4 were installed to evaluate and monitor groundwater conditions in the vicinity of PCE releases to soil from the former sewer line serving the Four Star Dry Cleaners facility;
- Well MW-5 was installed to evaluate the eastern boundary of the PCE plume as it crosses Southwest 178th Street and to confirm the absence of groundwater impacts related to operations at a former service station at the northeast corner of the Harris property;
- Wells MW-6 and MW-7 were installed off-site on the Dunn Lumber property to evaluate the downgradient extent of dissolved PCE in groundwater; and
- Wells MW-8 and MW-9 were installed north and northwest of the Dunn Lumber property to evaluate the extent of dissolved PCE in groundwater downgradient and cross-gradient of well MW-7.

### *2.3.1 Monitoring Well Installation and Development*

The monitoring well borings were drilled to using a truck-mounted hollow-stem auger drilling rig. Soil samples were collected at least two 18-inch intervals each 5 feet of drilling depth in each monitoring well boring for lithologic logging and field screening. Alternately, the lithology from soil borings completed in 2008 by ERM was used for the log of adjacent monitoring wells drilled after the borings were completed.

At each monitoring well, an ERM geologist completed field screening, collected required samples for laboratory analysis, and recorded the soil description on a boring log. Field screening of soil samples included visual observation for evidence of contamination and measurement of volatile organic vapors using a PID. For volatile organic vapor screening, each soil sample was placed in a sealable plastic bag. After approximately 10 minutes, the side of the bag was pierced using the PID probe and the PID response in parts per million was recorded on the boring logs for each screened sample. Results of lithologic logging and field screening are recorded on the boring logs included in Appendix B.

Monitoring wells were constructed using 2-inch-diameter polyvinyl chloride 0.010-inch-slot screen and casing. Soil lithology, drilling observations, and well construction details are included on the boring logs in Appendix B. Well construction details are summarized in Table 2.

After installation, the monitoring wells were developed by first surging the screened section with a polyethylene bailer and then by purging groundwater from the well using a submersible pump. During development, a minimum of ten well casing volumes were removed to remove sediment from the well casing and filter pack.

### *2.3.2 Soil Sampling During Well Installation*

Three soil samples were collected from the saturated zone in monitoring wells MW-3, MW-4, MW-5, and MW-7 to evaluate the natural oxidant demand he aquifer soil. The purpose of this test was to support evaluation of the feasibility of in situ chemical oxidation as a remedial technology for the Site. Each of the samples was analyzed for natural oxidant demand using American Society for Testing and Materials Method D7262-07 Test Method A by Carus Corporation's laboratory in Peru, Illinois. Makeup water for the natural oxidant demand was collected from monitoring well KMW-2.

## *2.4 GROUNDWATER SAMPLING*

Groundwater samples were collected from new wells MW-3 through MW-7, and 20 existing wells on 11 through 16 April 2008, and groundwater samples were collected from wells MW-8 and MW-9 on 19 August 2008. A summary of the analyses completed on the groundwater samples collected from each well is included in Table 1.

Groundwater samples were collected after purging at least three well casing volumes of water from each well using a submersible pump. During purging and sampling, the submersible pump intake was placed 1 to 2 feet below the groundwater surface in each well.

Groundwater samples from the monitoring wells were analyzed for VOCs or halogenated VOCs by USEPA Method 8260B. Additionally, the groundwater sample from well MW-5 was analyzed for hydrocarbon identification by Washington State Department of Ecology (Ecology) Method NWTPH-HCID, and samples from 11 wells were analyzed for dissolved arsenic, chromium, iron, and manganese by USEPA Methods 6010B and 6020. Petroleum hydrocarbon sampling was completed to

confirm the absence of petroleum-related contamination near a former service station on the Harris property, and metals analyses were completed to establish a baseline for comparison with conditions during remedial action, if warranted by the remediation methods implemented.

## *2.5 AIR SAMPLING*

Three air samples (NP-Basement, NP-Main Floor, and NP-Outdoor) were collected at the house at the location shown on Figure 2 on 20 May 2008. The samples were collected in the home's basement in an area with direct, open access to the crawlspace, in the living room on the main floor, and the east exterior of the house, respectively. Air samples were collected in the breathing zone in each location (approximately 5 feet above the floor). Air sampling was completed to empirically evaluate the risk of vapor intrusion from PCE in Site groundwater. The samples were each collected into a 1-liter stainless steel vacuum canister with no moisture filter and were sent to the TestAmerica laboratory in Santa Ana, California, for analysis of VOCs using USEPA Method TO-15. Weather conditions at the time of sampling were fair and mild with negligible wind.

## *2.6 LOCATION AND ELEVATION SURVEY*

The locations and elevations of the new borings and monitoring wells MW-3 through MW-7 were surveyed by Bush, Roed, and Hitchings of Seattle, Washington, on 14 and 29 April 2008. Locations and elevations of monitoring wells MW-8 and MW-9 were surveyed by White Shield, Inc., of Bellevue, Washington, on 19 August 2008. The 19 August 2008 survey also included a re-survey of the top of casing elevations at wells DC-1, DC-2, DC-3, DC-7, DC-8, DC-9A, DC-9B, DC-10B, and DC-19. The location and elevation survey results are included in Appendix C.

## *2.7 INVESTIGATION DERIVED WASTE*

Soil cuttings, purge water, and decontamination water generated during drilling, development, and sampling activities were contained in 55-gallon drums and stored on-site. General Environmental Management, Inc., of Pomona, California, removed 27 drums containing soil and nine drums containing water from the Site on 23 October 2008 for proper disposal. Waste manifests are included in Appendix D.

## *3.0 FIELD PROGRAM RESULTS*

This section summarizes the results of the field investigation activities completed at the Site.

## *3.1 GEOLOGIC CONDITIONS*

Soils encountered at the Site are primarily composed of silty sand to sand, with some gravelly intervals and scattered silt layers, to a depth of at least 52 feet on the Site. Gravel, where present, was typically observed in soils deeper than 10 feet bgs. Soils underlying this sandy unit range from dense silty gravel with sand and cobbles encountered at a depth of 46 feet bgs in well KMW-5D, to a hard silt encountered at depths of 15.5 and 34 feet in wells MW-8 and MW-9, respectively.

## *3.2 HYDROGEOLOGIC CONDITIONS*

Groundwater is typically encountered at a depth of approximately 32 to 42 feet bgs in the on-site wells, and at shallower depths in off-site wells topographically lower than the Site. Groundwater level and elevation data measured on 18 August 2008 are summarized in Table 3 and a potentiometric surface map derived from the groundwater elevation data is presented on Figure 3. The inferred direction of groundwater flow based on the August 2008 data is generally toward the north at a gradient of 0.0063. North of the Site, the average gradient increases to approximately 0.028. This increase in gradient corresponds with a marked thinning of the observed aquifer saturated thickness from greater than 15 feet on the Site to approximately 2 to 3 feet at MW-8 and MW-9 when the wells were installed in August 2008.

## *3.3 SOIL*

### *3.3.1 Volatile Organic Compounds*

PCE was detected in 29 of 39 soil samples collected during the DGI at concentrations of up to 594 µg/kg, and was detected at concentrations greater than the MTCA Method A Cleanup Level of 50 µg/kg in a total of five soil samples from borings B-10 (10 and 20 feet bgs), B-11 (20 and 30 feet bgs), and B-14 (30 feet bgs). No other VOCs were detected in the soil

samples. A summary of PCE concentrations detected in soil samples collected during the DGI is included on Table 4, and the extent of PCE in soils is illustrated on Figure 4. Laboratory analytical reports are included in Appendix E.

### *3.3.2 Natural Oxidant Demand*

Natural oxidant demand ranged from 0.5 to 0.9 grams of potassium permanganate per kilogram in soil samples collected from the saturated zone during drilling of monitoring wells MW-3, MW-4, MW-5, and MW-7. This result is based on the mass of potassium permanganate that would be required to overcome the natural oxidant demand per kilogram of aquifer soil. The average natural oxidant demand for the samples analyzed was 0.7 grams per kilogram. This level of natural oxidant demand is categorized as "very low," meaning that in an in situ chemical oxidation remediation scenario, a relatively small amount of oxidant would be required to overcome the natural oxidant demand of the aquifer material.

A summary of the natural oxidant demand detected in each of the samples is included in Table 5. The summary report for the natural oxidant demand testing is included in Appendix F.

## *3.4 GROUNDWATER*

Laboratory analytical reports for the groundwater samples are included in Appendix E.

### *3.4.1 Volatile Organic Compounds*

Groundwater sample analytical results from direct-push borings and monitoring wells are summarized in Table 6. The distribution of PCE in groundwater based on data from the 2008 sampling events is shown on Figure 5.

The VOCs chloroform and PCE were detected in the screening-level groundwater samples collected from the direct push borings completed during the DGI. Chloroform was detected at concentrations less than the MTCA Method B cleanup standard of 7.17 µg/L in the samples collected from borings B-5, B-17, and B-18. PCE was detected in four of the five samples (borings B-5, B-8, B-17, and B-18), and was at a concentration greater than the MTCA Method A Cleanup Level of 5 µg/L in the sample from boring B-8 (51.4 µg/L).

The VOCs bromodichloromethane, chloroform, cis-1,2-DCE, PCE , and TCE were detected in one or more groundwater samples collected from the monitoring wells. Of these compounds, only PCE was detected at concentrations greater than the applicable MTCA cleanup standard of 5 µg/L. PCE was detected in 19 of the 20 groundwater samples collected from the wells, and concentrations of the compound were greater than the MTCA Method A Cleanup Level in 10 of the samples.

Note that bromodichloromethane is a common byproduct of drinking water chlorination. Since it is not typically associated with PCE or dry cleaning operations, and since it is a commonly detected *ex situ* sample contaminant, the presence of the compound is attributed to contamination of the sample by tap water.

### *3.4.2 Petroleum Hydrocarbons*

Petroleum hydrocarbons were not detected in the groundwater sample collected from monitoring well MW-5. No other groundwater samples were analyzed for petroleum hydrocarbons.

### *3.4.3 Metals*

A summary of the dissolved metals detected in groundwater samples is included in Table 7. Of the nine groundwater samples collected, dissolved chromium was detected in one sample, dissolved iron in one sample, and dissolved manganese in three samples. None of the metals were detected at concentrations greater than applicable groundwater cleanup standards. Note that the metals samples were collected to evaluate baseline aquifer conditions that may be affected by future remediation efforts, and are not contaminants of concern at the Site.

## *3.5 AIR*

The analytical results for air samples collected from the Site are shown in Table 8. Although several VOCs were identified in the three samples, no PCE or related degradation product VOCs were detected in the samples.

## *4.0 CONCEPTUAL SITE MODEL*

**Contaminant of Concern:** PCE

**Contaminant Source:** Releases of PCE and/or PCE-containing materials to the environment have been identified at the Four Star Dry Cleaners facility at the MVSC property and a former dry cleaner on the Harris property (Figure 2). PCE releases at both sites appear to have been primarily related to discharge through sanitary sewer and septic systems. Lateral distribution of PCE in the unsaturated zone on the MVSC property appears to be influenced by a former sanitary sewer line replaced in 2000.

**Impacted media:** Soil and groundwater:

- Soil: PCE in the vicinity of the current and former sanitary sewer lines at the MVSC property (up to 59,000 µg/kg based on recent data from other sources) and the vicinity of the former septic system at the Harris property (up to 340 µg/kg based on recent data from other sources). The current extent of PCE concentrations above the MTCA Method A Cleanup Level in soil is included in Figure 4.
- Groundwater: PCE in the soil source areas extending northward, consistent with groundwater flow direction, to a terminus of impacts greater than applicable cleanup standards between the Dunn Lumber property and Southwest 176th Street to the north (Figure 5). Groundwater impacts are limited to the upper few feet of the saturated zone based on previous groundwater sampling results, and vertical migration to lower aquifers is not indicated by available data. PCE concentrations in groundwater range up to 95.8 µg/L on the Site, and up to 22.4 µg/L off the Site to the north.

**Exposure Pathways:** No complete pathways to human exposure to PCE have been identified to date, but the following potential pathways are present at the Site:

- Direct contact with soil (e.g., trench worker scenario);
- Soil to groundwater; and
- Consumption of groundwater.

Note that the indoor air pathway is incomplete based on empirical demonstration by direct sampling.

Based on the procedures established in MTCA, no terrestrial ecological evaluation is required for the Site because no hazardous substance listed on Table 749-2 in the regulation is present in Site soils. This determination is based on the provisions in WAC 173-340-7492(2)(c).

## *5.0 CONCLUSIONS*

- Groundwater flow across the Site is generally toward the north at a gradient of 0.0063. North of the Site, groundwater gradient increases to 0.028.
- Soils impacted with PCE above the MTCA Method A Cleanup Level are associated with the vicinity of Four Star Dry Cleaners facility and the associated former east-west sewer line north of the facility. Data from previous investigations also indicate PCE is present in vadose zone soils in the vicinity of the former septic tank at the Harris property, and scattered soil intervals in the area contain PCE at concentrations greater than the cleanup level.
- The current monitoring well network is sufficient to establish and monitor the nature and extent of PCE in groundwater at the Site.
- The distribution of PCE in groundwater at the Site is consistent with inferred groundwater flow direction and PCE sources at the Four Star Dry Cleaners facility and the associated east-west-trending sewer line north of the dry cleaner building. Although the presence of PCE-impacted soils near the water table in the vicinity of the former septic tank at the Harris property represent a potential source of PCE migration to groundwater, any indication of this contribution is obscured by PCE in groundwater migrating northward from the MVSC property to the south.
- The very low concentrations of cis-1,2-DCE and TCE and the absence of vinyl chloride in groundwater appear to indicate that natural degradation (i.e., reductive dechlorination) of PCE is not occurring at an observable rate. The relatively strongly oxidizing potential identified in Site groundwater during previous investigations is consistent with this observation.
- The natural oxidant demand of aquifer soils is very low, which suggests favorable conditions for remediation using in situ chemical oxidation.
- Indoor air sampling results do not indicate that PCE concentrations in groundwater are affecting indoor air quality in buildings at the Site.

*Figures*

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Drawn By: R.O./C.T.
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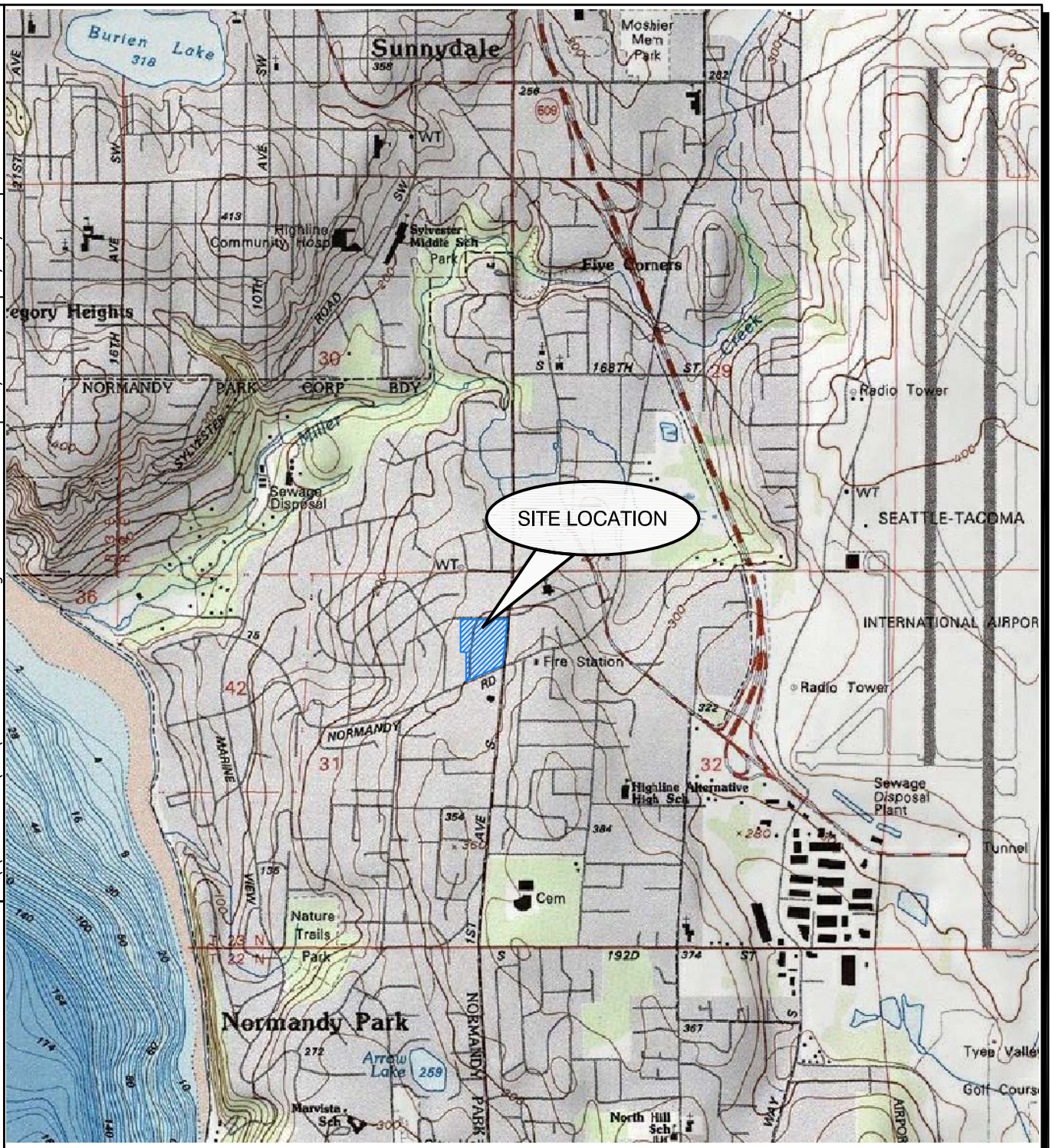


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1 1/2 0 1 MILE

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1 .5 0 1 KILOMETER

N

References:
TOPO!® Software
U.S.G.S. 7.5 Minute Series (Topographic) Quadrangle, Des Moines, WA
Version: 1995; Current: 1990

Figure 1
*Site Location Map*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM *11/08*

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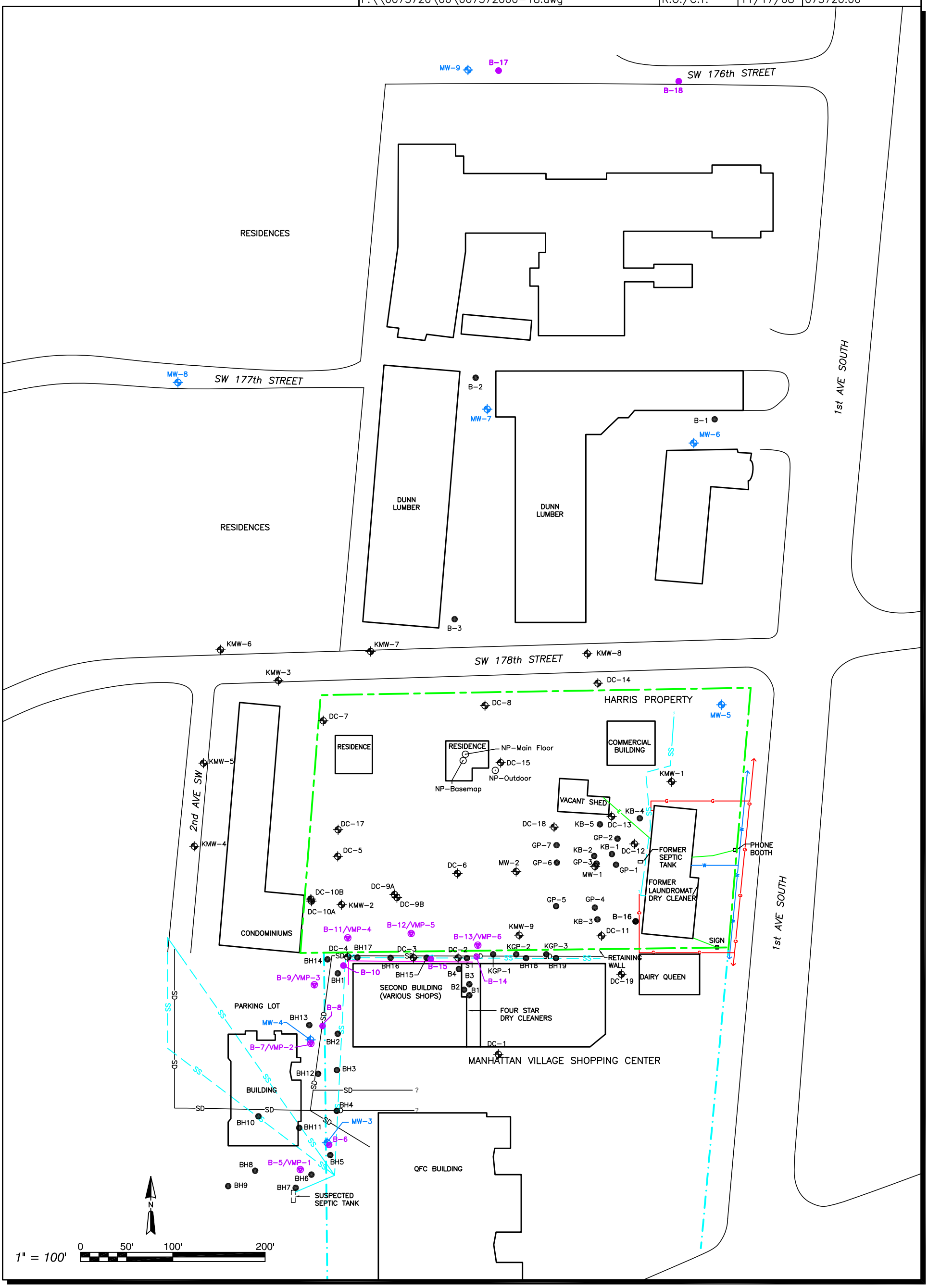


LEGEND

- Monitoring Well
- Soil Boring
- Soil Vapor Extraction Well
- Domestic Well
- Storm Water Catch Basin
- Monitoring Well, Installed 2008
- Soil Boring, Completed 2008
- Soil Vapor Probe, Installed 2008
- Air Sample, Collected 2008

- Approximate Harris Property Boundary
- Approximate Manhatten Plaza Shopping Center Property Boundary
- Underground Electrical Utility
- Underground Natural Gas Utility
- Underground Sewer Utility
- Underground Storm Drain Utility
- Underground Water Utility

# Figure 2
*Site Plan*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM 11/08

| CAD File: | Drawn By: | Date: | Project No. |
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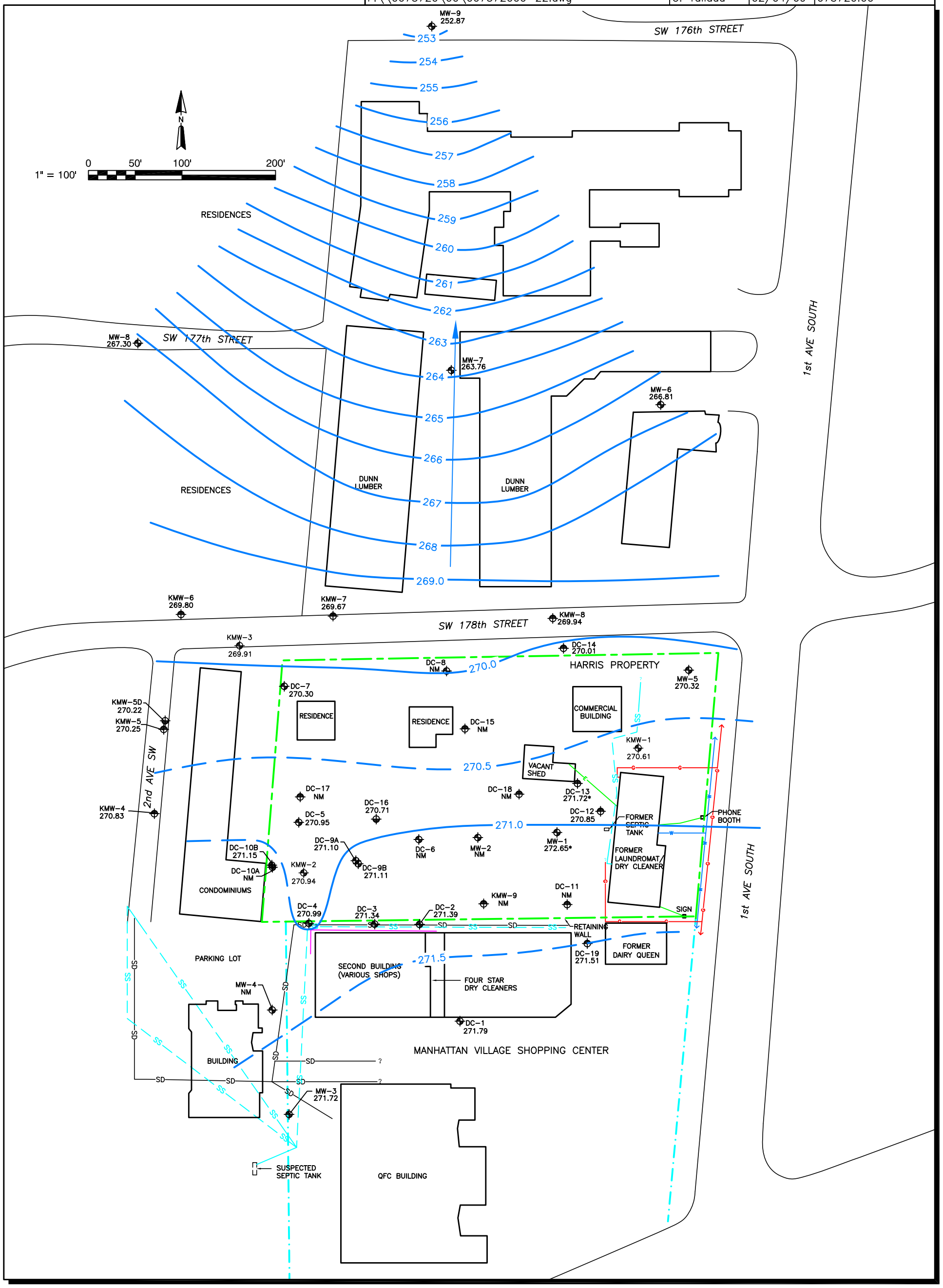


LEGEND

| | |
|---|---|
| ⊕ | Monitoring Well |
| ⊕ | Shallow Monitoring Well |
| ⊕ | Deep Monitoring Well |
| 271.72 | Groundwater Elevation (Feet AMSL) Measured on August 21, 2008 |
| — -271.00 — | Potentiometric Surface Elevation (Feet AMSL) |
| NM | Not Measured |
| * | Anamalous Data Point – Not Used for Potentiometric Contouring |
| → | Inferred Groundwater Flow Direction |
| | Approximate Harris Property Boundary |
| | Approximate Manhattan Village Shopping Center Property Boundary |
| E | Underground Electrical Utility |
| G | Underground Natural Gas Utility |
| SS | Underground Sewer Utility |
| SD | Underground Storm Drain Utility |
| W | Underground Water Utility |

Figure 3

*Potentiometric Surface Map*
*August 2008*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM 02/09

| CAD File: | Drawn By: | Date: | Project No. |
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N

1" = 100'

0 50' 100' 200'

B-17

B-18

SW 176th STREET

RESIDENCES

SW 177th STREET

1st AVE SOUTH

B-2

B-1

DUNN LUMBER

DUNN LUMBER

RESIDENCES

WATER SUPPLY WELL

B-3

SW 178th STREET

2nd AVE SW

HARRIS PROPERTY

RESIDENCE

RESIDENCE

COMMERCIAL BUILDING

WELL HOUSE

VACANT SHED

SVS-6 SVS-3 SVS-2

KB-4 KB-5 KB-2 KB-1

GP-2 GP-7 GP-6 SVS-5 GP-3 GP-1 SVS-4

FORMER SEPTIC TANK

PHONE BOOTH

SVS-1

FORMER LAUNDROMAT/ DRY CLEANER

GP-5 GP-4 KB-3 B-16

SVS-7 SVS-8 SVS-9 SIGN

KGP-1 KGP-2 KGP-3

RETAINING WALL

FORMER DAIRY QUEEN

CONDOMINIUMS

B-11 B-12 B-14 B-13 B-15 B-10 B-9 B-8 B-7 B-5 B-6

BH17 BH14 BH16 BH15 BH18 BH19 BH1 BH13 BH2 BH12 BH3 BH4 BH10 BH11 BH8 BH9 BH7 BH6 BH5

S1 B4 B3 B2 B1

SECOND BUILDING (VARIOUS SHOPS)

FOUR STAR DRY CLEANERS

PARKING LOT

BUILDING

SUSPECTED SEPTIC TANK

MANHATTAN VILLAGE SHOPPING CENTER

QFC BUILDING

| B-12 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/27/08 | 10' | ND |
| | 20' | 2.99 |
| | 30' | 8.48 |

| B-13 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/27/08 | 10' | 31.1 |
| | 20' | 31.4 |
| | 30' | 23.1 |

| B-11 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/27/08 | 10' | 32.4 |
| | 20' | 346 |
| | 30' | 279 |

| B-9 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/25/08 | 10' | 6.16 |
| | 20' | 14.3 |
| | 30' | 11.6 |

| B-16 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/25/08 | 10' | ND |
| | 20' | ND |
| | 30' | ND |

| B-8 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/26/08 | 10' | 6.54 |
| | 20' | 5.54 |
| | 30' | 5.62 |

| B-14 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/24/08 | 10' | 11.8 |
| | 20' | 29.6 |
| | 30' | 594 |

| B-7 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/25/08 | 10' | ND |
| | 20' | 3.51 |
| | 30' | 8.84 |

| B-15 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/24/08 | 10' | 5.32 |
| | 20' | 18.8 |
| | 30' | 7.85 |

| B-5 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/26/08 | 10' | ND |
| | 20' | 3.4 |
| | 30' | 8.88 |

| B-10 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/24/08 | 10' | 671 |
| | 20' | 50.8 |
| | 30' | 15.4 |

| B-6 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/25/08 | 10' | ND |
| | 20' | 8.16 |
| | 30' | 8.99 |

LEGEND

- Existing Soil Boring
- Soil Boring, Completed 2008
- 32.4 — PCE Concetration (µg/kg)
- 279 — PCE Concentration Above the Cleanup Standard (50 µg/kg)
- Inferred Impacted Soil Boundary, April 2008 Data
- Inferred Impacted Soil Boundary, April 2005 Data
- Approximate Harris Property Boundary
- Approximate Manhattan Village Shopping Center Property Boundary
- Underground Electrical Utility
- Underground Natural Gas Utility
- Underground Sewer Utility
- Underground Storm Drain Utility
- Underground Water Utility

Figure 4

*Tetrachloroethene in Soil*

*MVSC/Harris Properties*

*Normandy Park, Washington*

ERM 11/08

S:\Dwgs\0075720 Normandy Park\00\007572000-19.dwg, Layout1

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| F:\\0075720\00\007572000-20.dwg | C. Tallada | 12/03/08 | 075720.00 |

N

1" = 100'

0 50' 100' 200'

RESIDENCES

MW-9 0.1**

B-17 0.720*

B-18 <0.200*

SW 176th STREET

1st AVE SOUTH

MW-8 0.2**

SW 177th STREET

MW-7 22.4

MW-6 1.99

DUNN LUMBER

DUNN LUMBER

RESIDENCES

KMW-6 NS

KMW-7 3.88

KMW-8 17.4

SW 178th STREET

KMW-3 NS

DC-14 NS

HARRIS PROPERTY

DC-8 39.4

MW-5 0.470

DC-7 50.8

KMW-5D NS

KMW-5 NS

RESIDENCE

RESIDENCE

DC-15 NS

COMMERCIAL BUILDING

KMW-1 <0.200

2nd AVE SW

VACANT SHED

DC-13 23.0

DC-17 74.6

DC-18 NS

DC-12 NS

KMW-4 NS

DC-5 NS

DC-16 NS

DC-6 NS

MW-2 NS

MW-1 NS

FORMER SEPTIC TANK

PHONE BOOTH

DC-10B NS

DC-9A NS

DC-9B 0.640

FORMER LAUNDROMAT/ DRY CLEANER

DC-10A NS

KMW-2 95.8

B-16 2.60

CONDOMINIUMS

DC-4 30.2

DC-3 27.8

DC-2 0.340

KMW-9 NS

DC-11 NS

SIGN

RETAINING WALL

DC-19 0.660

FORMER DAIRY QUEEN

SECOND BUILDING (VARIOUS SHOPS)

FOUR STAR DRY CLEANERS

PARKING LOT

B-8 51.4

MW-4 32.6

DC-1 NS

MANHATTAN VILLAGE SHOPPING CENTER

BUILDING

MW-3 2.31

B-5 0.480*

SUSPECTED SEPTIC TANK

QFC BUILDING

LEGEND

- Monitoring Well
- Shallow Monitoring Well
- Deep Monitoring Well
- Soil Boring
- 50.8 — PCE Concetration (µg/L)
- NS — Not Sampled
- * — Grab Groundwater Sample Collected From Soil Boring in March 2008
- ** — Groundwater Sample Collected in August 2008

- Inferred Area of PCE Above Cleanup Standard (5 µg/L)
- Approximate Harris Property Boundary
- Approximate Manhattan Village Shopping Center Property Boundary
- E — Underground Electrical Utility
- G — Underground Natural Gas Utility
- SS — Underground Sewer Utility
- SD — Underground Storm Drain Utility
- W — Underground Water Utility

Figure 5

*Tetrachloroethene in Groundwater*

*MVSC/Harris Properties*

*Normandy Park, Washington*

ERM 12/08

*Tables*

**TABLE 1**

*Sampling and Analysis Summary*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Sample Location | Soil | | | Groundwater | | | | | | Air |
|---|---|---|---|---|---|---|---|---|---|---|
| | Soil Sample Depths (feet bgs) | HVOCs Only by USEPA Method 8260B | Natural Oxidant Demand by ASTM D7262-07 Test Method A | Depth to Groundwater Measurement | VOCs (Full List) by USEPA Method 8260B | HVOCs Only by USEPA Method 8260B | Hydrocarbon Identification by Ecology Method NWTPH-HCID | Dissolved Metals (As, Cr, Fe, Mn) by USEPA Method 6010/6020 | Soil Oxidant Demand by ASTM Method D 2216-98 (Makeup Water) | VOCs (Full List) by USEPA Method TO-15 |
| *New Borings and Monitoring Wells* | | | | | | | | | | |
| B-5 | 10, 20, 30 | X (3 samples) | --- | --- | --- | X | --- | --- | --- | --- |
| B-6 | 10, 20, 30 | X (3 samples) | --- | --- | --- | --- | --- | --- | --- | --- |
| B-7 | 10, 20, 30 | X (3 samples) | --- | --- | --- | --- | --- | --- | --- | --- |
| B-8 | 10, 20, 30 | X (3 samples) | --- | --- | --- | X | --- | --- | --- | --- |
| B-9 | 10, 20, 30 | X (3 samples) | --- | --- | --- | --- | --- | --- | --- | --- |
| B-10 | 10, 20, 30 | X (3 samples) | --- | --- | --- | --- | --- | --- | --- | --- |
| B-11 | 10, 20, 30 | X (3 samples) | --- | --- | --- | --- | --- | --- | --- | --- |
| B-12 | 10, 20, 25 | X (3 samples) | --- | --- | --- | --- | --- | --- | --- | --- |
| B-13 | 10, 20, 30 | X (3 samples) | --- | --- | --- | --- | --- | --- | --- | --- |
| B-14 | 10, 20, 30 | X (3 samples) | --- | --- | --- | --- | --- | --- | --- | --- |
| B-15 | 10, 20, 30 | X (3 samples) | --- | --- | --- | --- | --- | --- | --- | --- |
| B-16 | 10, 20, 24 | X (3 samples) | --- | --- | --- | X | --- | --- | --- | --- |
| B-17 | 10, 20, 30 | X (3 samples) | --- | --- | --- | X | --- | --- | --- | --- |
| B-18 | --- | --- | --- | --- | --- | X | --- | --- | --- | --- |
| MW-3 | 43.5 | --- | X | X | --- | X | --- | --- | --- | --- |
| MW-4 | 40 | --- | X | X | --- | X | --- | --- | --- | --- |
| MW-5 | 43 | --- | X | X | X | --- | X | X | --- | --- |
| MW-6 | --- | --- | --- | X | --- | X | --- | X | --- | --- |
| MW-7 | 42 | --- | X | X | --- | X | --- | X | --- | --- |
| *Existing Monitoring Wells* | | | | | | | | | | |
| MW-1 | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| MW-2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| KMW-1 | --- | --- | --- | X | --- | X | --- | --- | --- | --- |
| KMW-2 | --- | --- | --- | X | --- | X | --- | X | X | --- |
| KMW-3 | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| KMW-4 | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| KMW-5 | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| KMW-5D | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| KMW-6 | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| KMW-7 | --- | --- | --- | X | --- | X | --- | --- | --- | --- |
| KMW-8 | --- | --- | --- | X | --- | X | --- | X | --- | --- |
| KMW-9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC-1 | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| DC-2 | --- | --- | --- | X | --- | X | --- | X | --- | --- |
| DC-3 | --- | --- | --- | X | --- | X | --- | X | --- | --- |
| DC-4 | --- | --- | --- | X | --- | X | --- | X | --- | --- |
| DC-5 | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| DC-7 | --- | --- | --- | X | --- | X | --- | X | --- | --- |
| DC-8 | --- | --- | --- | X | --- | X | --- | X | --- | --- |
| DC-9A | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| DC-9B | --- | --- | --- | X | --- | X | --- | X | --- | --- |
| DC-10B | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| DC-11 | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| DC-12 | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| DC-13 | --- | --- | --- | X | --- | X | --- | --- | --- | --- |
| DC-14 | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| DC-15 | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| DC-16 | --- | --- | --- | X | --- | --- | --- | --- | --- | --- |
| DC-17 | --- | --- | --- | X | --- | X | --- | --- | --- | --- |
| DC-18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| DC-19 | --- | --- | --- | X | --- | X | --- | --- | --- | --- |
| *Air Samples* | | | | | | | | | | |
| NP-Basement | --- | --- | --- | --- | --- | --- | --- | --- | --- | X |
| NP-Main Floor | --- | --- | --- | --- | --- | --- | --- | --- | --- | X |
| NP-Outdoor | --- | --- | --- | --- | --- | --- | --- | --- | --- | X |

**Notes:**

ASTM = American Society for Testing and Materials
feet bgs = feet below ground surface
HVOCs = Halogenated volatile organic compounds
USEPA = United States Environmental Protection Agency
VOCs = Volatile organic compounds

**FINAL**

**TABLE 2**

*Vapor Probe and Monitoring Well Construction Summary*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Probe/Well Number | Date Completed | Top of Casing Elevation (feet amsl) | Horizontal Location[1] | | Total Borehole Depth (feet bgs) | Casing Diameter/ Material | Wellhead Completion | Screen Slot Size (inches) | Screened Interval (feet bgs) |
|---|---|---|---|---|---|---|---|---|---|
| | | | Northing | Easting | | | | | |
| VMP-1 (B-5) | 3/26/2008 | 310.74 | 164828.2 | 1268482.3 | 30.0 | 3/4-inch PVC | Flush | 0.010 | 10-15 |
| VMP-2 (B-7) | 3/25/2008 | 310.81 | 164964.8 | 1268493.8 | 30.0 | 3/4-inch PVC | Flush | 0.010 | 10-15 |
| VMP-3 (B-9) | 3/25/2008 | 310.43 | 165028.5 | 1268497.5 | 31.0 | 3/4-inch PVC | Flush | 0.010 | 10-15 |
| VMP-4 (B-11) | 3/27/2008 | 307.52 | 165079.3 | 1268533.8 | 30.0 | 3/4-inch PVC | Flush | 0.010 | 10-15 |
| VMP-5 (B-12) | 3/27/2008 | 308.07 | 165084.0 | 1268602.4 | 25.0 | 3/4-inch PVC | Flush | 0.010 | 10-15 |
| VMP-6 (B-13) | 3/27/2008 | 308.82 | 165071.4 | 1268674.6 | 26.0 | 3/4-inch PVC | Flush | 0.010 | 10-15 |
| MW-3 | 4/8/2008 | 307.49 | 164857.3 | 1268511.4 | 47.0 | 2-inch PVC | Flush | 0.010 | 36-46 |
| MW-4 | 4/8/2008 | 306.54 | 164968.8 | 1268493.4 | 44.0 | 2-inch PVC | Flush | 0.010 | 34-44 |
| MW-5 | 4/8/2008 | 306.28 | 165331.9 | 1268938.5 | 46.0 | 2-inch PVC | Flush | 0.010 | 36-46 |
| MW-6 | 4/9/2008 | 300.27 | 165615.5 | 1268908.5 | 45.0 | 2-inch PVC | Flush | 0.010 | 35-45 |
| MW-7 | 4/9/2008 | 298.76 | 165652.2 | 1268684.8 | 45.0 | 2-inch PVC | Flush | 0.010 | 35-45 |
| MW-8 | 8/18/2008 | 280.08 | 165681.2 | 1268349.8 | 26.0 | 2-inch PVC | Flush | 0.010 | 12-23 |
| MW-9 | 8/18/2008 | 285.11 | 166019.8 | 1268663.9 | 55.0 | 2-inch PVC | Flush | 0.010 | 31.5-41.5 |

**Notes:**

[1]Horizontal Datum: NAD 83/91
amsl = Above mean sea level
bgs = Below ground surface
btoc = Below top of casing
NA = Data not available
PVC = Polyvinyl chloride

**FINAL**

**Table 3**

*Water Levels - 21 August 2008*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Location | Well Casing Elevation (feet amsl) | Depth to Water (feet below well casing) | Water Level Elevation (feet amsl) |
|---|---|---|---|
| MW-1 | 309.97 | 37.32 | 272.65 |
| MW-2 | Well could not be located | | |
| MW-3 | 311.49 | 39.77 | 271.72 |
| MW-4 | 310.54 | NM[1] | --- |
| MW-5 | 310.28 | 39.96 | 270.32 |
| MW-6 | 304.27 | 37.46 | 266.81 |
| MW-7 | 302.76 | 39.00 | 263.76 |
| MW-8 | 280.08 | 12.78 | 267.30 |
| MW-9 | 285.11 | 32.24 | 252.87 |
| DC-1 | 312.72 | 40.93 | 271.79 |
| DC-2 | 313.04 | 41.65 | 271.39 |
| DC-3 | 313.23 | 41.89 | 271.34 |
| DC-4 | 312.12 | 41.13 | 270.99 |
| DC-5 | 306.10 | 35.15 | 270.95 |
| DC-6 | Well could not be located | | |
| DC-7 | 302.78 | 32.48 | 270.30 |
| DC-8 | 306.38 | NM[1] | --- |
| DC-9A | 308.02 | 36.92 | 271.10 |
| DC-9B | 308.16 | 37.05 | 271.11 |
| DC-10A | Well could not be located | | |
| DC-10B | 307.89 | 36.74 | 271.15 |
| DC-11 | 311.02 | NM[1] | --- |
| DC-12 | 310.90 | 40.05 | 270.85 |
| DC-13 | 310.85 | 39.13 | 271.72 |
| DC-14 | 308.60 | 38.59 | 270.01 |
| DC-15 | 307.54 | NM[1] | --- |
| DC-16 | 307.12 | 36.41 | 270.71 |
| DC-17 | 304.89 | NM[1] | --- |
| DC-18 | Well could not be located | | |
| DC-19 | 313.53 | 42.02 | 271.51 |
| KMW-1 | 311.21 | 40.60 | 270.61 |
| KMW-2 | 306.90 | 35.96 | 270.94 |
| KMW-3 | 296.92 | 27.01 | 269.91 |
| KMW-4 | 299.45 | 28.62 | 270.83 |
| KMW-5 | 297.10 | 26.85 | 270.25 |
| KMW-5D | 296.94 | 26.72 | 270.22 |
| KMW-6 | 294.70 | 24.90 | 269.80 |
| KMW-7 | 301.32 | 31.65 | 269.67 |
| KMW-8 | 308.08 | 38.14 | 269.94 |
| KMW-9 | 310.18 | NM | --- |

**Notes:**

[1]Well located in Spring 2008, could not be located or accessed on 21 August 2008.

**TABLE 4**

*Volatile Organic Compounds in Soil Samples*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Boring Number | Date Sampled | Sample Depth (feet bgs) | Volatile Organic Compounds[1] (µg/kg) |
|---|---|---|---|
| | | | Tetrachloroethene |
| B-5 | 3/26/2008 | 10 | <2.87 |
| | | 20 | **3.40** |
| | | 30 | **8.88** |
| B-6 | 3/25/2008 | 10 | <3.02 |
| | | 20 | **8.16** |
| | | 30 | **8.99** |
| B-7 | 3/25/2008 | 10 | <151 |
| | | 20 | **3.51** |
| | | 30 | **8.84** |
| B-8 | 3/26/2008 | 10 | **6.54** |
| | | 20 | **5.54** |
| | | 30 | **5.62** |
| B-9 | 3/25/2008 | 10 | **6.16** |
| | | 20 | **14.3** |
| | | 30 | **11.6** |
| B-10 | 3/24/2008 | 10 | **671** |
| | | 20 | **50.8** |
| | | 30 | **15.4** |
| B-11 | 3/27/2008 | 10 | **32.4** |
| | | 20 | **346** |
| | | 30 | **279** |
| B-12 | 3/27/2008 | 10 | <2.92 |
| | | 20 | **2.99** |
| | | 25 | **8.48** |
| B-13 | 3/27/2008 | 10 | **31.1** |
| | | 20 | **31.4** |
| | | 30 | **23.1** |
| B-14 | 3/24/2008 | 10 | **11.8** |
| | | 20 | **29.6** |
| | | 30 | **594** |
| B-15 | 3/24/2008 | 10 | **5.32** |
| | | 20 | **18.8** |
| | | 30 | **7.85** |
| B-16 | 3/25/2008 | 10 | <3.24 |
| | | 20 | <3.24 |
| | | 24 | <139 |
| B-17 | 3/26/2008 | 10 | <2.69 |
| | | 20 | <2.51 |
| | | 30 | <2.44 |
| Cleanup Goal[2] | | | 50 |

**Notes:**
**Bold** entries indicate positive analyte detections.
Shaded cells indicate concentrations greater than the cleanup goal
[1]Halogenated volatile organic compounds by USEPA Method 8260
[2]Model Toxics Control Act Method A Soil Cleanup Standard for Unrestricted Land Use
bgs = below ground surface
µg/kg = Micrograms per kilogram
ND = Not detected at a concentration greater than the method detection limit

**FINAL**

**TABLE 5**

*Natural Oxidant Demand in Soil Samples*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Boring Number | Date Sampled | Sample Depth (feet bgs) | Natural Oxidant Demand[1] (g/kg) | | | |
|---|---|---|---|---|---|---|
| | | | Average | Replicate 1 | Replicate 2 | Replicate 3 |
| MW-3 | 4/8/2008 | 43.5 | 0.8 | 0.7 | 0.9 | 0.9 |
| MW-4 | 4/8/2008 | 40 | 0.6 | 0.5 | 0.7 | 0.6 |
| MW-5 | 4/8/2008 | 43 | 0.8 | 0.8 | 0.9 | 0.8 |
| MW-7 | 4/10/2008 | 42 | 0.6 | 0.5 | 0.6 | 0.7 |
| Overall Average | | | 0.7 | --- | --- | --- |

**Notes:**

[1]By American Society of Testing and Materials Method D7262-07

bgs = Below ground surface

g/kg = Grams of potassium permanganate per kilogram

**FINAL**

**TABLE 6**

*Volatile Organic Compounds in Groundwater*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Boring/Well Number | Date Sampled | Volatile Organic Compounds[1] (µg/L) | | | | |
|---|---|---|---|---|---|---|
| | | Bromodichloro-methane | Chloroform | cis-1,2-Dichloroethene | Tetrachloroethene | Trichloroethene |
| *Collected from Soil Borings* | | | | | | |
| B-5 | 3/26/2008 | <0.200 | **0.960** | <0.200 | **0.480** | <0.200 |
| B-8 | 3/26/2008 | <0.200 | <0.200 | <0.200 | **51.4** | <0.200 |
| B-16 | 3/26/2008 | <0.200 | <0.200 | <0.200 | **2.60** | <0.200 |
| B-17 | 3/26/2008 | <0.200 | **0.690** | <0.200 | **0.720** | <0.200 |
| B-18 | 3/24/2008 | <0.200 | **0.270** | <0.200 | <0.200 | <0.200 |
| *Collected from Monitoring Wells* | | | | | | |
| MW-3 | 4/14/2008 | <0.200 | **0.990** | <0.200 | **2.31** | <0.200 |
| MW-4 | 4/14/2008 | <0.200 | **0.780** | **0.320** | **32.6** | **0.490** |
| MW-5 | 4/11/2008 | <0.200 | <0.200 | <0.200 | **0.470** | <0.200 |
| MW-6 | 4/15/2008 | <0.200 | <0.200 | <0.200 | **1.99** | <0.200 |
| MW-7 | 4/16/2008 | <0.200 | **1.12** | <0.200 | **22.4** | <0.200 |
| MW-8 | 8/21/2008 | <0.1 | **0.3 J** | <0.1 | **0.2 J** | <0.1 |
| MW-9 | 8/21/2008 | <0.1 | **0.4 J** | <0.1 | **0.1 J** | <0.1 |
| KMW-1 | 4/14/2008 | <0.200 | **0.450** | <0.200 | <0.200 | <0.200 |
| KMW-2 | 4/16/2008 | <0.200 | **0.640** | <0.200 | **95.8** | **0.230** |
| KMW-7 | 4/15/2008 | <0.200 | **1.33** | <0.200 | **3.88** | <0.200 |
| KMW-8 | 4/15/2008 | **0.310** | **1.13** | <0.200 | **17.4** | <0.200 |
| DC-2 | 4/14/2008 | <0.200 | **1.60** | <0.200 | **0.340** | <0.200 |
| DC-3 | 4/14/2008 | <0.200 | **1.50** | <0.200 | **27.8** | <0.200 |
| DC-4 | 4/11/2008 | <0.200 | **1.20** | <0.200 | **30.2** | <0.200 |
| DC-7 | 4/16/2008 | <0.200 | **1.08** | <0.200 | **50.8** | <0.200 |
| DC-8 | 4/16/2008 | <0.200 | **0.370** | <0.200 | **39.4** | <0.200 |
| DC-9A | 4/15/2008 | Well Dry | | | | |
| DC-9B | 4/15/2008 | <0.200 | **1.27** | <0.200 | **0.640** | <0.200 |
| DC-10B | - - | Well inaccessible beneath heavy brush | | | | |
| DC-13 | 4/16/2008 | <0.200 | **0.280** | <0.200 | **23.0** | <0.200 |
| DC-17 | 4/16/2008 | <0.200 | **0.750** | <0.200 | **74.6** | <0.200 |
| DC-18 | - - | Could not be locate well | | | | |
| DC-19 | 4/14/2008 | <0.200 | <0.200 | <0.200 | **0.660** | <0.200 |
| Cleanup Goal | | 0.71[2] | 7.17[2] | 80[3] | 5[4] | 5[4] |

**Notes:**

**Bold** entries indicate positive analyte detections.

Shaded cells indicate concentrations greater than the cleanup goal

[1]Halogenated volatile organic compounds by USEPA Method 8260

[2]Model Toxics Control Act Method B Groundwater Cleanup Level (Carcinogenic)

[3]Model Toxics Control Act Method B Groundwater Cleanup Level (Noncarcinogenic)

[4]Model Toxics Control Act Method A Groundwater Cleanup Level

µg/L = Micrograms per liter

J = Concentration reported as "estimated" by lab

**FINAL**

**TABLE 7**

*Dissolved Metals in Groundwater*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Dissolved Metals[1] (µg/L) | | | |
|---|---|---|---|---|---|
| | | Arsenic | Chromium | Iron | Manganese |
| MW-5 | 4/11/2008 | <1.00 | <1.00 | <150 | **165** |
| MW-6 | 4/15/2008 | <1.00 | <1.00 | <150 | **924** |
| KMW-2 | 4/16/2008 | <1.00 | <1.00 | <150 | <10.0 |
| KMW-8 | 4/15/2008 | <1.00 | <1.00 | <150 | <10.0 |
| DC-2 | 4/14/2008 | <1.00 | <1.00 | <150 | <10.0 |
| DC-3 | 4/11/2008 | <1.00 | <1.00 | **292** | **24.3** |
| DC-4 | 4/11/2008 | <1.00 | **1.03** | <150 | <10.0 |
| DC-8 | 4/16/2008 | <1.00 | <1.00 | <150 | <10.0 |
| DC-9b | 4/15/2008 | <1.00 | <1.00 | <150 | <10.0 |

**Notes:**

[1]By United States Environmental Protection Agency Methods 6010B and 6020
µg/L = Micrograms per liter

**FINAL**

**TABLE 8**

*Volatile Organic Compounds in Air*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Boring Number | Date Sampled | Volatile Organic Compounds[1] (ppbv) | | | |
|---|---|---|---|---|---|
| | | 1,1-Dichloroethene | Methylene Chloride | 1,1,1-Trichloroethane | Trichlorofluoromethane |
| NP-Basement | 5/20/2008 | **0.12 J** | <0.15 | <0.15 | <0.20 |
| NP-Main Floor | 5/20/2008 | <0.10 | **0.30 J** | **0.91** | **0.62** |
| NP-Outdoor | 5/20/2008 | <0.10 | <0.15 | **0.21 J** | **0.46** |

**Notes:**

**Bold** entries indicate positive analyte detections.

[1]Halogenated volatile organic compounds by USEPA Method TO-15

J = Concentration reported as "estimated" by lab

ppbv = Parts per billion by volume

# *Appendix A*
# *Site Investigation Bibliography*

*SITE BIBLIOGRAPHY (ORGANIZED BY DATE)*


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*Appendix B*
*Boring and Vapor Probe/*
*Monitoring Well Construction Logs*

**ERM**
915 118th Avenue SE, Suite 130
Bellevue, WA 98005
Phone: (425) 462-8591
Fax: (425) 4553573

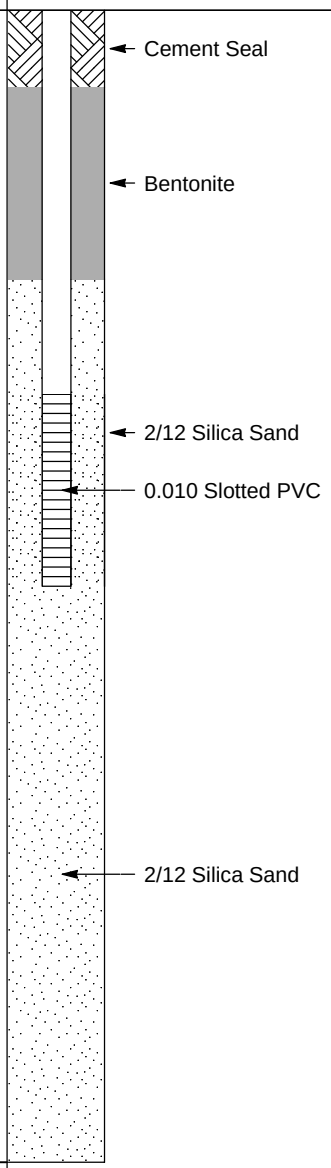
# LOG OF BORING / VAPOR PROBE: B-5 / VMP-1

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/26/2008
Date Completed: 3/26/2008
Total Depth: 30 feet
Borehole Diameter: 2.0"
Initial Water Level: feet bgs
Notes:

| Depth (ft) | USCS Code | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|
| | | | No Recovery |
| 5 | SM | PID = 0 | SILTY SAND (SM): Reddish brown fine to medium silty sand with trace gravel, dry. |
| 10 | SP | | SAND (SP): Light grayish brown fine to medium sand with trace silt, dry. |
| 15 | ML | PID = 0 | SILT (ML): Light brown silt, damp. |
| 20 | SP | | SAND (SP): Light grayish brown fine to medium silty sand with gravel, dry. Becomes damp at 28' below ground surface. |
| 25 | | PID = 0.2 | |
| | | PID = 0.7 | |
| 30 | | | Total Depth - 30 feet bgs |

WELL DIAGRAM




MW2 TO 40 FT BV - - 11/21/08 14:25 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

**ERM**
915 118th Avenue SE, Suite 130
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Phone: (425) 462-8591
Fax: (425) 4553573

# LOG OF BOREHOLE: B-6

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/25/2008
Date Completed: 3/25/2008
Total Depth: 31 feet
Borehole Diameter: 2.0"
Initial Water Level:
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No recovery. |
| 5 | | SM | | | SILTY SAND (SM): light brown, fine to medium sand, trace silt. |
| 10 | | SP | | | GRAVELLY SAND (SP): light brown, fine to medium sand. |
| 15 | | SM | | | SAND WITH SILT (SM): light brown, fine to medium sand, with 1.0-2.0" thick silt lenses. |
| 20 | | | | | |
| 25 | | | | | SILTY SAND (SM): fine to medium sand, some silt. SILTY SAND (SM): fine to medium sand, trace silt. |
| 30 | | | | | SAND WITH SILT (SM): fine to medium sand, with tan silt beds. |
| | | | | | Total Depth - 31 feet bgs |
| 35 | | | | | |

BOREHOLE TO 40 FEET BV - - 05/08/08 13:48 - G:\GINT BORING LOGS\NORMANDY PARK - 0075720\GINT FILES\NORMANDY PARK.GPJ

**ERM**
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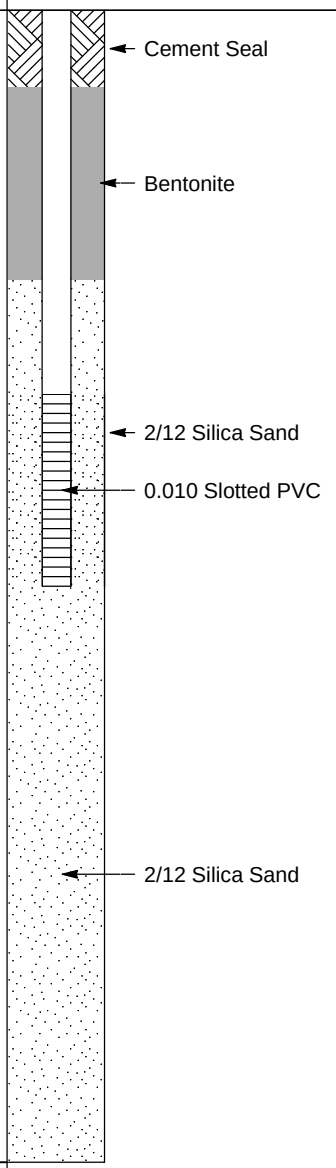
Phone: (425) 462-8591
Fax: (425) 4553573

# LOG OF BORING / VAPOR PROBE: B-7 / VMP-2

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/25/2008
Date Completed: 3/25/2008
Total Depth: 30 feet
Borehole Diameter: 2.0"
Initial Water Level: feet bgs
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No recovery. |
| 5 | | SP | | | SAND (SP): dark brown, fine to medium sand, trace gravel, moist. |
| | | | | PID = 0 | |
| 10 | | | | | SAND (SP): grayish brown, fine to medium sand. |
| | | | | | SAND (SP): grayish brown, fine to medium sand, some gravel. |
| 15 | | | | | |
| | | SM | | | SAND WITH SILT (SM): grayish brown, fine to medium sand, with 1.0" silt lenses. |
| 20 | | | | PID = 0.7 | |
| 25 | | SP | | | SAND (SP): grayish brown, fine to medium sand, some gravel. |
| | | | | | GRAVELLY SAND (SP): fine to medium sand, 1.0-2.0" silt lenses. |
| 30 | | | | | Total Depth - 30 feet bgs |




MW2 TO 40 FT BV - - 11/21/08 14:28 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

**ERM**
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# LOG OF BOREHOLE: B-8

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/26/2008
Date Completed: 3/26/2008
Total Depth: 33 feet
Borehole Diameter: 2.0"
Initial Water Level: 41 feet bgs
Notes: Water level measured during second penetration with push rods.

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No recovery. |
| 5 | | SP | | PID = 0 | SAND (SP): reddish brown, fine to medium sand, some gravel. |
| 10 | | ML | | | SILT (ML): light brown. |
| | | SM | | | SILTY SAND (SM): brown, fine to medium sand, trace gravel. |
| | | | | PID = 0.2 | |
| 15 | | | | | SILTY SAND (SM): grayish brown, fine to medium sand, trace silt. |
| | | | | PID = 0 | |
| 20 | | SP | | PID = 0 | SAND (SP): gray, fine to medium grained, trace gravel. |
| 25 | | | | | GRAVELLY SAND (SP): light gray, fine to medium sand, trace silt. |
| | | | | PID = 0.3 | |
| | | SM | | | SILTY SAND (SM): light gray, fine to medium sand. |
| 30 | | SP | | | GRAVELLY SAND (SP): medium to coarse grained. |
| | | | | PID = 2.6 | |
| | | | | | Total Depth - 33 feet bgs |
| 35 | | | | | |

BOREHOLE TO 40 FEET BV - - 06/11/08 09:42 - G:\GINT BORING LOGS\NORMANDY PARK - 0075720\GINT FILES\NORMANDY PARK.GPJ

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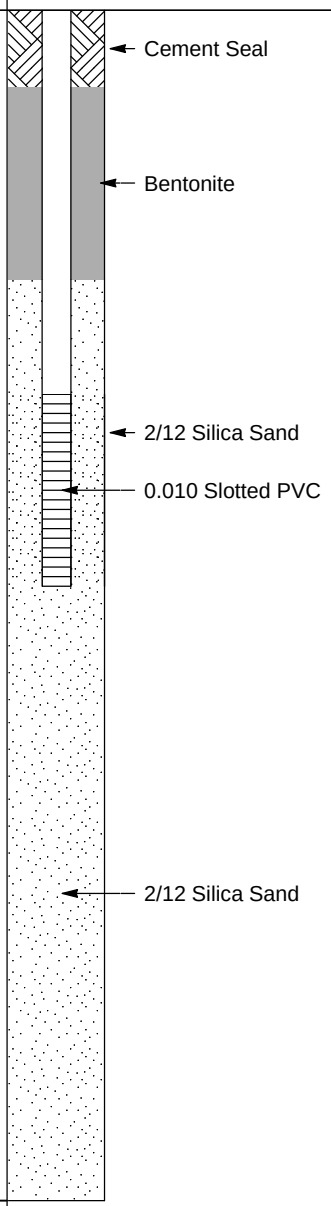
# LOG OF BORING / VAPOR PROBE: B-9 / VMP-3

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/25/2008
Date Completed: 3/25/2008
Total Depth: 31 feet
Borehole Diameter: 2.0"
Initial Water Level: feet bgs
Notes:

| Depth (ft) | USCS Code | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|
| | | | No recovery. |
| 10 | SP | PID = 0 | SAND (SP): light brown, fine to medium sand. |
| 15 | ML | | SILT (ML): light brown, wet. |
| | SM | PID = 0 | SAND WITH SILT (SM): light grayish brown, fine to medium sand, thin <0.5" silt lenses. |
| 20 | SP | | GRAVELLY SAND (SP): light gray, fine to medium sand. |
| | | | SAND (SP): light grayish brown, fine to medium sand. |
| 25 | ML | PID = 1.9 | SILT (ML): light brown, very hard. |
| | SM | | SILTY SAND (SM): fine grained. |
| 30 | | | SILTY SAND (SM): light brown, fine to medium sand. |
| | | | Total Depth - 31 feet bgs |

WELL DIAGRAM




MW2 TO 40 FT BV - - 11/21/08 14:31 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

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# LOG OF BOREHOLE: B-10

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/24/2008
Date Completed: 3/24/2008
Total Depth: 30 feet
Borehole Diameter: 2.0"
Initial Water Level:
Notes: PID malfunctioned.

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No recovery. |
| 5 | | SM | | | SILTY SAND (SM): fine to medium grained, trace gravel. |
| 10 | | | | | SILTY SAND (SM): fine to medium sand, some silt. |
| | | SP | | | SAND (SP): fine to medium sand, some silt. |
| 15 | | | | | |
| 20 | | | | | |
| | | SM | | | SILTY SAND (SM): fine to medium sand, gravelly, trace silt. |
| 25 | | | | | |
| | | | | | SILTY SAND (SM): fine to medium sand, gravelly, trace silt. |
| 30 | | | | | Total Depth - 30 feet bgs |
| 35 | | | | | |



BOREHOLE TO 40 FEET BV - - 05/08/08 13:50 - G:\GINT BORING LOGS\NORMANDY PARK - 0075720\GINT FILES\NORMANDY PARK.GPJ

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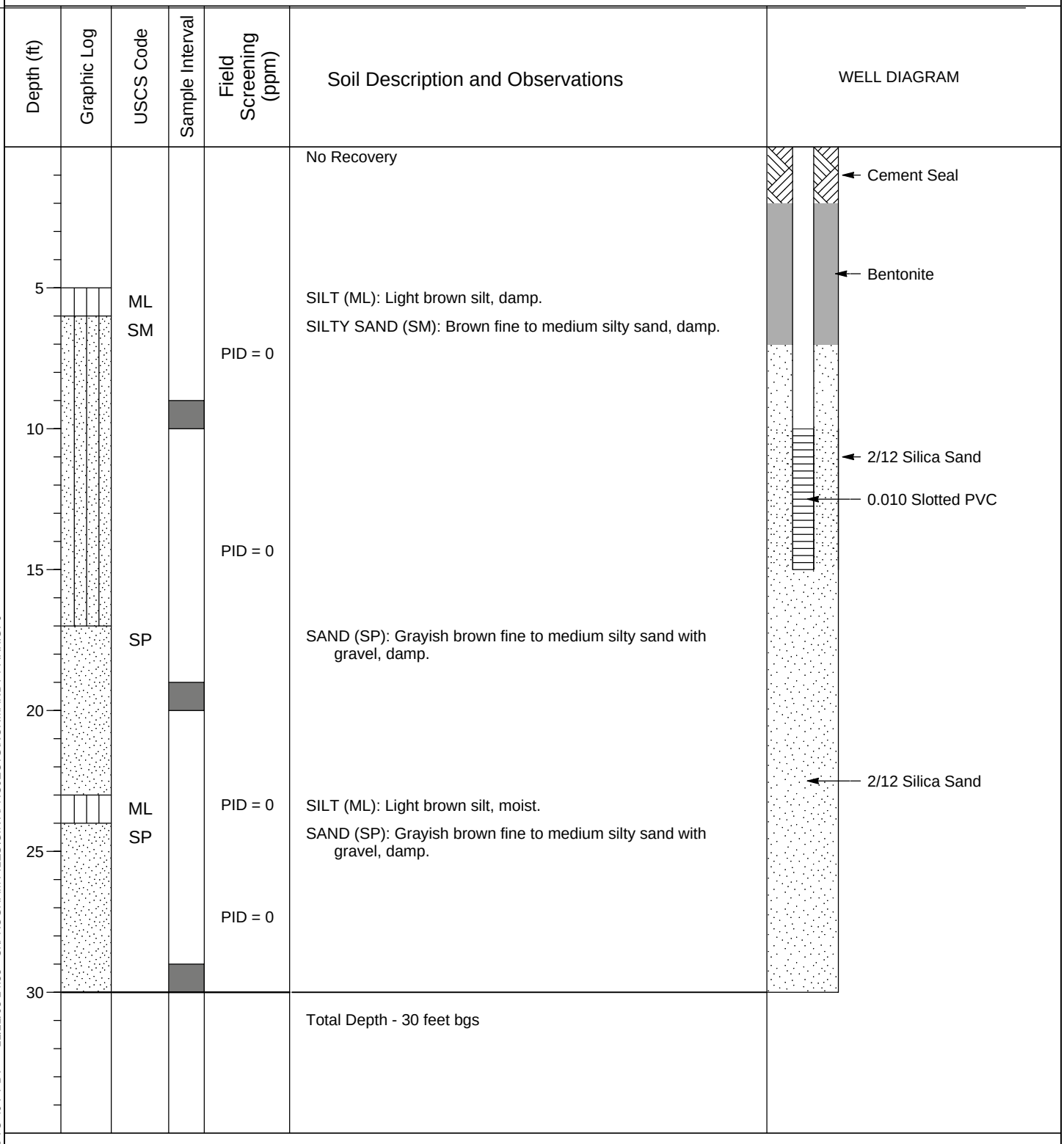
# LOG OF BORING / VAPOR PROBE: B-11 / VMP-4

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/27/2008
Date Completed: 3/27/2008
Total Depth: 30 feet
Borehole Diameter: 2.0"
Initial Water Level: feet bgs
Notes:




MW2 TO 40 FT BV - - 11/21/08 14:35 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

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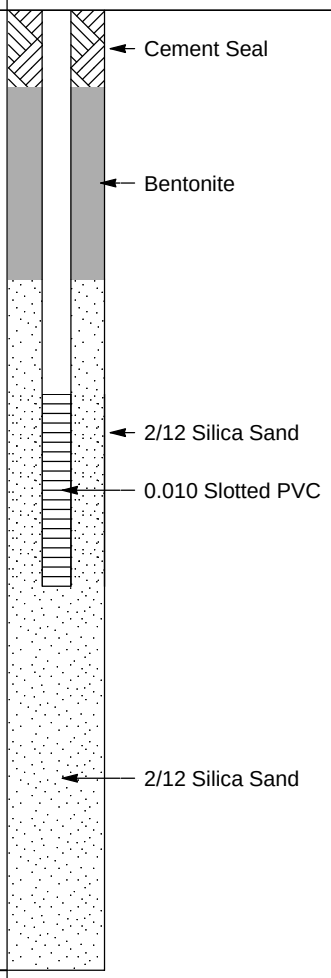
# LOG OF BORING / VAPOR PROBE: B-12 / VMP-5

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/27/2008
Date Completed: 3/27/2008
Total Depth: 25 feet
Borehole Diameter: 2.0"
Initial Water Level: feet bgs
Notes: PID Malfunctioned.

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No Recovery |
| 5 | | ML | | | SILT (ML): Dark brown silt, wet. |
| | | SM | | | SILTY SAND (SM): Brown to grayish brown fine to medium silty sand, damp. |
| 10 | | | | | |
| 15 | | ML | | | SILT (ML): Light brown silt, damp |
| | | SM | | | SILTY SAND (SM): Light brown fine to medium silty sand, damp. Refusal encountered at 25' below ground surface. |
| 20 | | | | | |
| 25 | | | | | Total Depth - 25 feet bgs |
| 30 | | | | | |

WELL DIAGRAM




MW2 TO 40 FT BV - - 11/21/08 14:37 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

**ERM**
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Fax: (425) 4553573

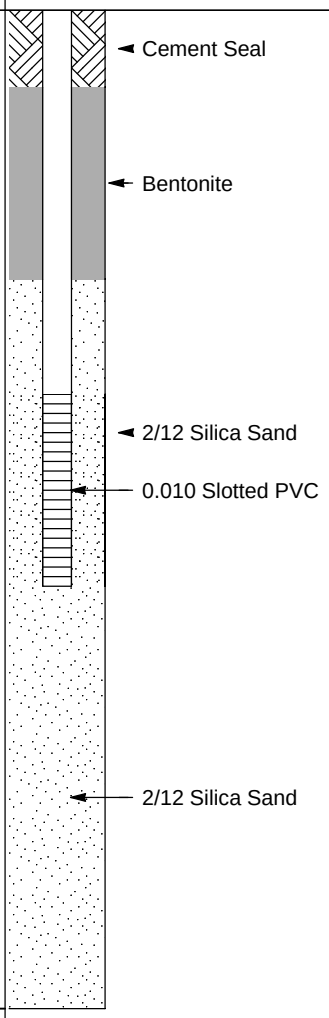
# LOG OF BORING / VAPOR PROBE: B-13 / VMP-6

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/27/2008
Date Completed: 3/27/2008
Total Depth: 26 feet
Borehole Diameter: 2.0"
Initial Water Level: feet bgs
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No Recovery |
| 5 | | SM | | PID = 0 | SILTY SAND (SM): Light brown fine to medium silty sand, damp. |
| 10 | | | | PID = 0 | |
| 15 | | | | PID = 0 | |
| | | ML | | | SILT (ML): Brown stiff silt, damp. |
| | | SM | | | SILTY SAND (SM): Brown fine to medium silty sand, damp. |
| 20 | | | | | |
| | | GP | | | SANDY GRAVEL (GP): Gray fine sandy gravel, damp. |
| | | SM | | | SILTY SAND (SM): Grayish brown fine to medium silty sand, damp. |
| 25 | | | | PID = 0 | |
| | | | | | Total Depth - 26 feet bgs |
| 30 | | | | | |

WELL DIAGRAM






MW2 TO 40 FT BV - - 11/21/08 14:17 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

**ERM**
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Fax: (425) 4553573

# LOG OF BOREHOLE: B-14

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/24/2008
Date Completed: 3/24/2008
Total Depth: 32 feet
Borehole Diameter: 2.0"
Initial Water Level:
Notes: PID malfunctioned.

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No recovery. |
| 5 | | SM | | | SILTY SAND (SM): fine sand, trace gravel, moist. |
| 10 | | | | | SILTY SAND (SM): gray, fine to medium sand, some silt. |
| | | SP | | | SAND (SP): gray, fine to medium sand, trace gravel. |
| 15 | | | | | |
| 20 | | SM | | | SAND WITH SILT (SM): very fine to fine sand, lenses of very fine silty sand (4.0" thick). |
| | | | | | No recovery. |
| 25 | | | | | |
| | | SP | | | SAND (SP): fine to medium sand, trace silt and gravel. |
| 30 | | | | | |
| | | | | | Total Depth - 32 feet bgs |
| 35 | | | | | |

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# LOG OF BOREHOLE: B-15

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/24/2008
Date Completed: 3/24/2008
Total Depth: 30 feet
Borehole Diameter: 2.0"
Initial Water Level:
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No recovery. |
| 5 | | SP | | | SAND (SP): fine sand, trace silt and gravel. |
| 10 | | | | | SAND (SP): fine to medium sand, trace gravel. |
| | | | | | SAND (SP): fine to medium sand, trace silt, some organics, damp. |
| 15 | | | | | |
| 20 | | SM | | | SANDY SILT (SM): fine sand. |
| | | ML | | | SILT (ML): light brown, damp. |
| | | SM | | | SAND WITH SILT (SM): gray, fine to medium sand, with sandy silt lenses. |
| 25 | | | | | |
| | | SP | | | GRAVELLY SAND (SP): fine to medium sand. |
| 30 | | | | | Total Depth - 30 feet bgs |
| 35 | | | | | |



BOREHOLE TO 40 FEET BV - - 05/08/08 13:50 - G:\GINT BORING LOGS\NORMANDY PARK - 0075720\GINT FILES\NORMANDY PARK.GPJ

**ERM**
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Fax: (425) 4553573

# LOG OF BOREHOLE: B-16

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/25/2008
Date Completed: 3/25/2008
Total Depth: 24 feet
Borehole Diameter: 2.0"
Initial Water Level:
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No recovery. |
| 5 | | SM | | PID = 0 | SILTY SAND (SM): fine to medium sand, trace gravel. |
| 10 | | SP | | PID = 0 | GRAVELLY SAND (SP): fine to medium sand, trace silt. |
| 15 | | SM | | PID = 0.5 | SILTY SAND (SM): fine to medium sand. |
| 20 | | SP | | PID = 0.3 | GRAVELLY SAND (SP): fine to medium sand. |
| 25 | | | | | Total Depth - 24 feet bgs |
| 30 | | | | | |
| 35 | | | | | |

BOREHOLE TO 40 FEET BV - - 05/08/08 13:50 - G:\GINT BORING LOGS\NORMANDY PARK - 0075720\GINT FILES\NORMANDY PARK.GPJ

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Fax: (425) 455-3573

# LOG OF BOREHOLE: B-17

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/26/2008
Date Completed: 3/26/2008
Total Depth: 36 feet
Borehole Diameter: 2.0"
Initial Water Level: 34 feet bgs
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No recovery. |
| 5 | | | | | |
| | | ML | | | SILT (ML): light brown silt, stiff. |
| 10 | | | | PID = 0 | |
| 15 | | SM | | | SAND WITH SILT (SM): fine to medium sand, with 1.0-2.0" silt lenses. |
| 20 | | ML | | | SILT (ML): light brown silt. |
| | | SM | | PID = 0 | SILTY SAND (SM): fine to medium sand, some silt, bands of orange oxidized sand. |
| 25 | | | | | SAND WITH SILT (SM): fine to medium sand, with 3.0-4.0" silt lenses. |
| | | | | PID = 0 | |
| 30 | | | | | SAND WITH SILT (SM): as above. |
| | | SP | | | SAND (SP): light gray, fine to medium grained. Wet at 34' bgs. |
| 35 | | ▽ | | | |
| | | | | | Total Depth - 36 feet bgs |



BOREHOLE TO 40 FEET BV - - 11/21/08 15:43 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

**ERM**
915 118th Avenue SE, Suite 130
Bellevue, WA 98005
Phone: (425) 462-8591
Fax: (425) 455-3573

# LOG OF BOREHOLE: B-18

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/24/2008
Date Completed: 3/24/2008
Total Depth: 40 feet
Borehole Diameter: 2.0"
Initial Water Level: 31 feet bgs
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No recovery. |
| 5 | | SM | | | SILTY SAND (SM): light brown, fine sand, trace silt. |
| 10 | | ML | | | SILTY SAND (SM): very fine sand.<br>Grades to SILT (ML): soft. |
| 15 | | SP | | | SAND (SP): medium grained, trace gravel, dry. |
| 20 | | | | | |
| 25 | | | | | SAND (SP): fine to medium sand, trace gravel. |
| 30 | | | | | SAND (SP): fine to medium sand, trace gravel. Wet at 31' bgs. |
| 35 | | SM | | | SILTY SAND (SM): fine sand, some silt. Wet |
| | | | | | SILTY SAND (SM): fine grained. Wet |
| 40 | | | | | Total Depth - 40 feet bgs |

BOREHOLE TO 40 FEET BV - - 11/21/08 15:47 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

**ERM**
915 118th Avenue SE, Suite 130
Bellevue, WA 98005
Phone: (425) 462-8591
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# LOG OF BOREHOLE: B-18

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/24/2008
Date Completed: 3/24/2008
Total Depth: 40 feet
Borehole Diameter: 2.0"
Initial Water Level: 31'
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No recovery. |
| 5 | | SM | | | SILTY SAND (SM): light brown, fine sand, trace silt. |
| 10 | | ML | | | SILTY SAND (SM): very fine sand, damp to moist.<br>Grades to SILT (ML): soft, wet. |
| 15 | | SP | | | SAND (SP): medium grained, trace gravel, dry. |
| 20 | | | | | |
| 25 | | | | | SAND (SP): fine to medium sand, trace gravel. |
| 30 | | ▽ | | | SAND (SP): fine to medium sand, trace gravel, saturated. |
| 35 | | SM | | | SILTY SAND (SM): fine sand, some silt. |
| | | | | | SILTY SAND (SM): fine grained, saturated. |

BOREHOLE TO 40 FEET BV - - 05/08/08 13:47 - G:\GINT BORING LOGS\NORMANDY PARK - 0075720\GINT FILES\NORMANDY PARK.GPJ

**ERM**
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Phone: (425) 462-8591
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# LOG OF BOREHOLE: B-18

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Direct Push
Logged By: K. Knesek

Date Started: 3/24/2008
Date Completed: 3/24/2008
Total Depth: 40 feet
Borehole Diameter: 2.0"
Initial Water Level: 31'
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Field Screening (ppm) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | Total Depth - 40 feet bgs |
| 45 | | | | | |
| 50 | | | | | |
| 55 | | | | | |
| 60 | | | | | |
| 65 | | | | | |
| 70 | | | | | |
| 75 | | | | | |



BOREHOLE TO 40 FEET BV - - 05/08/08 13:47 - G:\GINT BORING LOGS\NORMANDY PARK - 0075720\GINT FILES\NORMANDY PARK.GPJ

**ERM**
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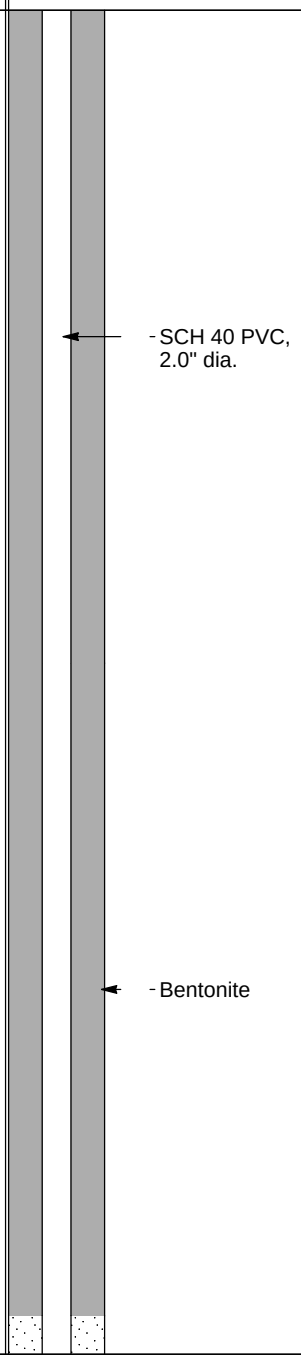
# LOG OF MONITORING WELL: MW-3

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: K. Knesek

Date Started: 4/8/2008
Date Completed: 4/8/2008
Total Depth: 47 feet
Borehole Diameter: 4.0"
Initial Water Level: 40 feet bgs
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | BLOW COUNTS (N VALUE) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No recovery. |
| 5 | | SM | | | SILTY SAND (SM): light brown, fine to medium sand, trace silt. |
| 10 | | SP | | | GRAVELLY SAND (SP): light brown, fine to medium sand. |
| 15 | | SM | | | SAND WITH SILT (SM): light brown, fine to medium sand, with 1.0-2.0" thick silt lenses. |
| 20 | | | | | SILTY SAND (SM): fine to medium sand, some silt. |
| 25 | | | | | SILTY SAND (SM): fine to medium sand, trace silt. |
| | | | | | SAND WITH SILT (SM): fine to medium sand, with tan silt beds. |
| 30 | | SP | | 27-50 | SAND (SP): light brown, fine to medium sand, some silt increasing with depth, damp |
| | | SW | | 50 | GRAVELLY SAND (SW): fine to medium sand, gravel decreasing with depth. |

WELL DIAGRAM




MW2 TO 40 FT BV - - 11/21/08 16:23 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

**ERM**
915 118th Avenue SE, Suite 130
Bellevue, WA 98005
Phone: (425) 462-8591
Fax: (425) 4553573

# LOG OF MONITORING WELL: MW-3

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: K. Knesek

Date Started: 4/8/2008
Date Completed: 4/8/2008
Total Depth: 47 feet
Borehole Diameter: 4.0"
Initial Water Level: 40 feet bgs
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | BLOW COUNTS (N VALUE) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | SP | | 17-50 | SAND (SP): fine to medium sand, some silt, some gravel, moist. |
| | | | | 17-50 | SAND (SP): brown, fine sand, trace gravel, very dense, moist. |
| 40 | | ▽ | | 27-50 | SAND (SP): brown, fine sand, very dense, wet. |
| | | SW | | 50 | GRAVELLY SAND (SW): brown, fine sand, very dense, wet. |
| 45 | | SP | | 50 | SAND (SP): brown, fine to medium sand, very dense, wet. |
| | | | | | SAND (SP): brown, fine to medium sand, trace gravel, very dense, wet. |
| | | | | | Total Depth - 47 feet bgs |
| 50 | | | | | |
| 55 | | | | | |
| 60 | | | | | |
| 65 | | | | | |

WELL DIAGRAM

- 0.010" Slotted Screen, 2.0" dia.
- Silica Sand

MW2 TO 40 FT BV - - 11/21/08 16:23 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

**ERM**
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Phone: (425) 462-8591
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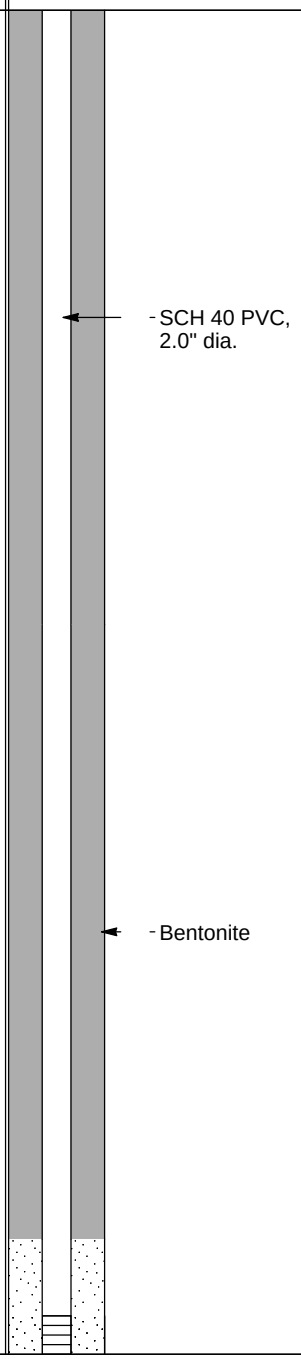
# LOG OF MONITORING WELL: MW-4

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: K. Knesek

Date Started: 4/8/2008
Date Completed: 4/8/2008
Total Depth: 44 feet
Borehole Diameter: 4.0"
Initial Water Level: 38 feet bgs
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | BLOW COUNTS (N VALUE) | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | No recovery. |
| 5 | | SP | | | SAND (SP): reddish brown, fine to medium sand, some gravel. |
| 10 | | ML | | | SILT (ML): light brown. |
| | | SM | | | SILTY SAND (SM): brown, fine to medium sand, trace gravel. |
| 15 | | | | | SILTY SAND (SM): grayish brown, fine to medium sand, trace silt. |
| 20 | | SP | | | SAND (SP): gray, fine to medium grained, trace gravel. |
| 25 | | | | | GRAVELLY SAND (SP): light gray, fine to medium sand, trace silt. |
| | | SM | | | SILTY SAND (SM): light gray, fine to medium sand. |
| 30 | | SP | | 16-20-27 (47) | GRAVELLY SAND (SP): brown, fine to medium sand, hard, moist. |
| | | SM | | 22-50 | FINE SAND (SM): brown, fine sand, trace silt, increasing gravel with depth, very hard, moist. |

WELL DIAGRAM




MW2 TO 40 FT BV - - 11/21/08 16:25 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

**ERM**
915 118th Avenue SE, Suite 130
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# LOG OF MONITORING WELL: MW-4

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: K. Knesek

Date Started: 4/8/2008
Date Completed: 4/8/2008
Total Depth: 44 feet
Borehole Diameter: 4.0"
Initial Water Level: 38 feet bgs
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | BLOW COUNTS (N VALUE) | Soil Description and Observations | WELL DIAGRAM |
|---|---|---|---|---|---|---|
| 40 | | SP | | | SAND (SP): brown, fine grained, very hard, damp. | |
| | | | | 50 | | |
| | | SP | | 22-50 | SAND (SP): brown, fine to medium grained, some gravel, very hard, wet. | 0.010" Slotted Screen, 2.0" dia. |
| | | | | 24-50 | GRAVELLY SAND (SP): fine to medium sand, very hard, wet. | Silica Sand |
| 45 | | | | | Total Depth - 44 feet bgs | |
| 50 | | | | | | |
| 55 | | | | | | |
| 60 | | | | | | |
| 65 | | | | | | |

MW2 TO 40 FT BV - - 11/21/08 16:25 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

**ERM**
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# LOG OF MONITORING WELL: MW-5

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: K. Knesek

Date Started: 4/8/2008
Date Completed: 4/8/2008
Total Depth: 46 feet
Borehole Diameter: 4.0"
Initial Water Level: 40 feet bgs
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | BLOW COUNTS (N VALUE) | Soil Description and Observations | WELL DIAGRAM |
|---|---|---|---|---|---|---|
| | | | | | Vacuum cleared. | |
| 5 | | SP | | 10-16-19 (35) | SAND (SP): brown, fine to medium grained, hard, dry. | |
| | | | | 8-12-16 (28) | SAND (SP): brown, fine grained, increasing silt, hard, damp. | SCH 40 PVC, 2.0" dia. |
| 10 | | | | 12-16-22 (38) | SAND (SP): brown, fine grained, increasing gravel, moist. | |
| | | | | 24-50 | SAND (SP): brown, fine to medium grained, very hard, moist. | |
| 15 | | | | 31-50 | SAND (SP): brown, fine to medium grained, increasing gravel, very hard, moist. | |
| | | | | 32-50 | SAND (SP): dark brown, fine to medium grained, trace gravel, very hard, moist. | |
| 20 | | | | 19-50 | SAND (SP): dark brown, fine to medium grained, very hard, moist. | |
| | | | | 35-50 | SAND (SP): dark brown, fine to medium grained, increasing gravel, very hard, damp. | |
| 25 | | | | 12-17-50 (67) | SAND (SP): dark brown, fine to medium grained, trace silt, very hard, damp. | Bentonite |
| | | | | 50 | GRAVELLY SAND (SP): dark brown, fine to medium grained, damp. | |
| 30 | | | | 50 | GRAVELLY SAND (SP): dark brown, fine to medium grained, very hard, moist. | |
| | | | | 12-50 | GRAVELLY SAND (SP): dark brown, fine to medium grained, very hard, wet. | |
| | | | | 50 | GRAVELLY SAND (SP): dark brown, fine to medium grained, | |

MW2 TO 40 FT BV - - 11/21/08 16:21 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

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Phone: (425) 462-8591
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# LOG OF MONITORING WELL: MW-5

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: K. Knesek

Date Started: 4/8/2008
Date Completed: 4/8/2008
Total Depth: 46 feet
Borehole Diameter: 4.0"
Initial Water Level: 40 feet bgs
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | BLOW COUNTS (N VALUE) | Soil Description and Observations | WELL DIAGRAM |
|---|---|---|---|---|---|---|
| | | | | | very hard, moist. | |
| | | | | 50 | GRAVELLY SAND (SP): dark brown, fine to medium grained, very hard, moist. | |
| 40 | | ▽ | | | GRAVELLY SAND (SP): dark brown, fine to medium grained, wet. | - 0.010" Slotted Screen, 2.0" dia. |
| | | | | 50 | GRAVELLY SAND (SP): dark brown, fine to medium grained, very hard, wet. | - Silica Sand |
| 45 | | | | 50 | GRAVELLY SAND (SP): dark brown, fine to medium grained, wet. | |
| | | | | | Total Depth - 46 feet bgs | |
| 50 | | | | | | |
| 55 | | | | | | |
| 60 | | | | | | |
| 65 | | | | | | |

MW2 TO 40 FT BV - - 11/21/08 16:21 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

**ERM**
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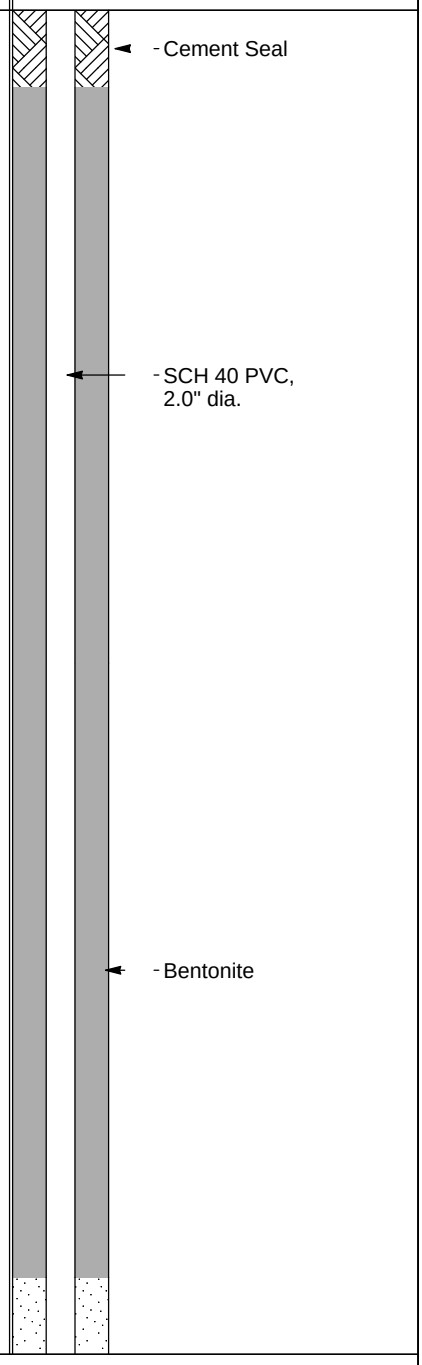
# LOG OF MONITORING WELL: MW-6

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: K. Knesek

Date Started: 4/9/2008
Date Completed: 4/9/2008
Total Depth: 45 feet
Borehole Diameter: 4.0"
Initial Water Level: 39 feet bgs
Notes:

| Depth (ft) | USCS Code | Sample Interval | BLOW COUNTS (N VALUE) | Soil Description and Observations |
|---|---|---|---|---|
| | | | | Vacuum cleared. |
| 5 | SM | | 6-8-9 (17) | FINE SAND (SM): light brownish red, very fine sand, some silt, dry. |
| | | | 9-10-10 (20) | FINE SAND (SM): grayish brown, very fine to fine sand, some silt lenses, dry. |
| 10 | | | 5-7-10 (17) | SILTY SAND (SM): brown, very fine sand, some organics, trace gravel, moist. |
| | | | 50 | SILTY SAND (SM): brown, very fine sand, trace gravel, moist. |
| 15 | | | 12-15-19 (34) | SILTY SAND (SM): brown, very fine sand, moist. |
| | | | 5-7-7 (14) | SILTY SAND (SM): grayish brown, very fine sand, some silt, moist. |
| 20 | | | 8-14-12 (26) | SILTY SAND (SM): grayish brown, very fine sand, some silt, damp. |
| | | | 50 | FINE SAND (SM): gray, very fine sand, trace silt, moist. |
| 25 | SP | | 27-50 | SAND (SP): gray, fine grained, very hard, moist. |
| | | | 17-23-27 (50) | SAND (SP): grayish brown, fine grained, trace gavel and silt. |
| 30 | | | 12-50 | SAND (SP): grayish brown, fine grained, trace gravel. |
| | | | 15-26-30 (56) | SAND (SP): brown, fine grained, silt lense (4.0" thick), trace gravel, damp. |
| | | | 50 | SAND (SP): gray, fine grained, trace gravel, moist. |

WELL DIAGRAM




MW2 TO 40 FT BV - - 11/21/08 16:17 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

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915 118th Avenue SE, Suite 130
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Phone: (425) 462-8591
Fax: (425) 4553573

# LOG OF MONITORING WELL: MW-6

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: K. Knesek

Date Started: 4/9/2008
Date Completed: 4/9/2008
Total Depth: 45 feet
Borehole Diameter: 4.0"
Initial Water Level: 39 feet bgs
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | BLOW COUNTS (N VALUE) | Soil Description and Observations | WELL DIAGRAM |
|---|---|---|---|---|---|---|
| 40 | | | | 50 | SAND (SP): gray, fine to medium sand, very hard, moist. | 0.010" Slotted Screen, 2.0" dia. |
| | | ▽ | | 50 | GRAVELLY SAND (SP): grayish brown, fine to medum sand, very hard, wet. | |
| | | | | 50 | GRAVELLY SAND (SP): grayish brown, fine to medium sand, very hard, wet. | Silica Sand |
| 45 | | | | | Total Depth - 45 feet bgs | |
| 50 | | | | | | |
| 55 | | | | | | |
| 60 | | | | | | |
| 65 | | | | | | |

MW2 TO 40 FT BV - - 11/21/08 16:17 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

**ERM**
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Phone: (425) 462-8591
Fax: (425) 4553573

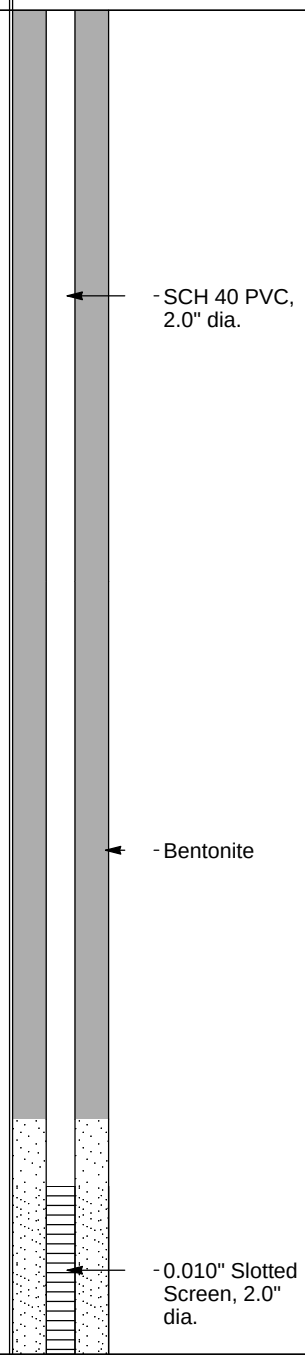
# LOG OF MONITORING WELL: MW-7

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: K. Knesek

Date Started: 4/9/2008
Date Completed: 4/9/2008
Total Depth: 45 feet
Borehole Diameter: 4.0"
Initial Water Level: 39 feet bgs
Notes:

| Depth (ft) | USCS Code | BLOW COUNTS (N VALUE) | Soil Description and Observations |
|---|---|---|---|
| | | | Vacuum cleared. |
| 5 | SP | 15-15-16 (31) | SAND (SP): brown, fine grained, some gravel, moist. |
| | | 8-9-7 (16) | SAND (SP): brown, fine grained, moist. |
| 10 | | 8-12-18 (30) | SAND (SP): brown, fine grained, grading to fine silty sand, some organics in silty sand, moist. |
| | SM | | SILTY SAND (SM): brown, fine grained, grades to fine sand with trace gravel, moist. |
| | | 8-8-16 (24) | |
| 15 | | 7-8-12 (20) | SILTY SAND (SM): brown, fine sand, grades to brown silt, damp. |
| | | 8-8-13 (21) | SILTY SAND (SM): brown, fine sand, some silt lenses (0.5-1.0" thick), moist. |
| 20 | SP | 10-11-12 (23) | SAND (SP): grayish brown, fine grained, grades to silty fine sand, moist. |
| | SM | 8-9-13 (22) | SILTY SAND (SM): brown, fine grained, dry. |
| 25 | | 12-13-16 (29) | SILTY SAND (SM): light brown, fine grained, damp. |
| | | 10-15-13 (28) | SILTY SAND (SM): fine grained, grades to fine sand, trace silt, dry. |
| 30 | SP | 17-50 | SAND (SP): grayish brown, fine grained, very hard, dry. |
| | | 21-50 | SAND (SP): grayish brown, fine grained, trace gravel, very hard, dry. |
| 35 | | 24-50 | SAND (SP): grayish brown, fine grained, grades to fine gravelly brown sand, very hard, dry. |
| | | 19-50 | SAND (SP): brown, fine to medium sand, very hard, moist. |
| | | 18-50 | SAND (SP): brown, fine to medium grained, very hard, wet. |

WELL DIAGRAM




MW2 TO 40 FT BV - - 11/21/08 16:30 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

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Bellevue, WA 98005
Phone: (425) 462-8591
Fax: (425) 4553573

# LOG OF MONITORING WELL: MW-7

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: K. Knesek

Date Started: 4/9/2008
Date Completed: 4/9/2008
Total Depth: 45 feet
Borehole Diameter: 4.0"
Initial Water Level: 39 feet bgs
Notes:

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | BLOW COUNTS (N VALUE) | Soil Description and Observations | WELL DIAGRAM |
|---|---|---|---|---|---|---|
| | | | | | | Silica Sand |
| | | | | 50 | | |
| 45 | | | | | Total Depth - 45 feet bgs | |
| 50 | | | | | | |
| 55 | | | | | | |
| 60 | | | | | | |
| 65 | | | | | | |
| 70 | | | | | | |
| 75 | | | | | | |

MW2 TO 40 FT BV - - 11/21/08 16:30 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY PARK.GPJ

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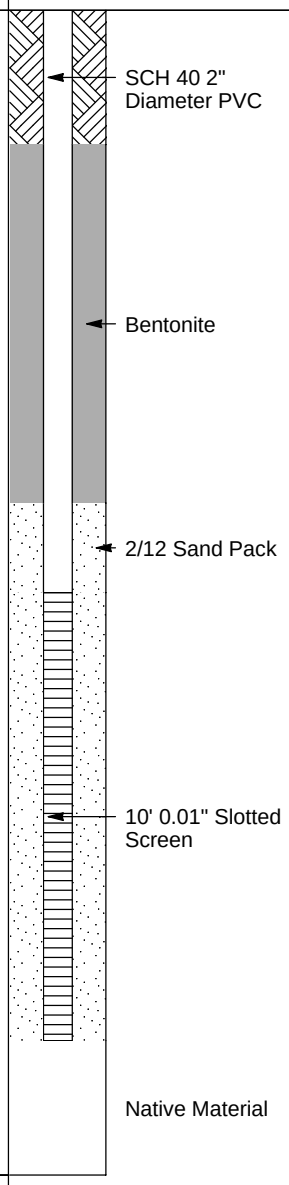
# LOG OF MONITORING WELL: MW-8

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: Olivia Williams

Date Started: 8/18/2008
Date Completed: 8/18/2008
Total Depth: 26 feet
Borehole Diameter: 4"
Initial Water Level: 12.78 feet bgs
Notes: Vacuum Cleared to 4' bgs.

| Depth (ft) | Graphic Log | USCS Code | Sample Interval | Blow Counts | Soil Description and Observations |
|---|---|---|---|---|---|
| | | | | | VACUUM CLEARED. No Recovery. |
| | | SM | | 4<br>7<br>8 | Brown fine silty SAND, damp. |
| 5 | | | | | |
| | | | | 7<br>7<br>11 | |
| 10 | | | | | |
| | | | | 7<br>15<br>17 | |
| 15 | | ML | | | Light brown SILT with very fine sand, trace gravel, dense, damp. |
| 20 | | ML | | | Light grey SILT with some fine sand, dense, damp. |
| | | | | 8<br>15<br>17 | |
| 25 | | ML | | | Dark grey SILT, dense, moist. |
| | | | | | Total Depth - 26 feet bgs |

WELL DIAGRAM




MW2 TO 40 FT BV - - 9/15/08 10:04 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY_OLW.GPJ

**ERM**
915 118th Avenue SE, Suite 130
Bellevue, WA 98005
Phone: (425) 462-8591
Fax: (425) 4553573

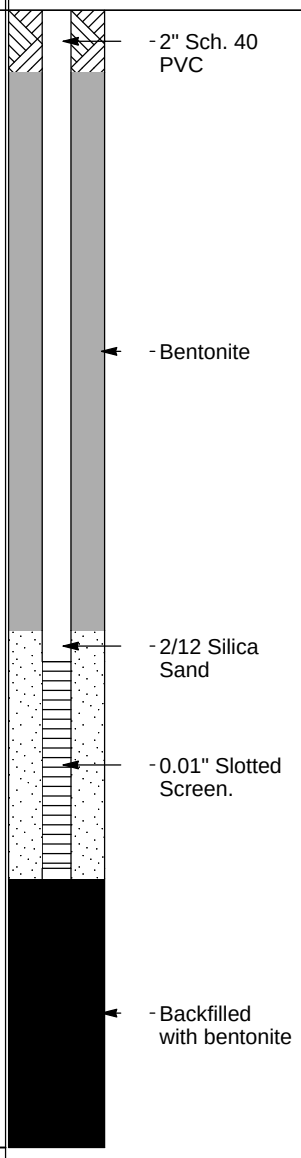
# LOG OF MONITORING WELL: MW-9

Project Number: 0075720.00
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: Olivia Williams

Date Started: 8/18/2008
Date Completed: 8/18/2008
Total Depth: 55 feet
Borehole Diameter: 4"
Initial Water Level: 32.24 feet bgs
Notes: Vacuum Cleared to 4' bgs.

| Depth (ft) | USCS Code | Sample Interval | BLOW COUNTS (N VALUE) | Soil Description and Observations |
|---|---|---|---|---|
| | | | | VACUUM CLEARED. NO RECOVERY. |
| 5 | SP | | 4-5-4 (9) | Stiff course SAND, some silt, wet. |
| 10 | SM | | 2-4-8 (12) | Brown very fine silty SAND, damp. Some clay from 19' bgs to 34' bgs. Wet at 32' bgs. |
| 15 | | | 4-7-8 (15) | |
| 20 | | | 6-7-12 (19) | |
| 25 | | | 9-15-15 (30) | |
| 30 | | | | |
| 35 | ML | | 15-16-18 (34) | Light brown dense SILT, some gravel, damp. Becomes grey and moist at 39' bgs. |
| 40 | | | 13-15-15 (30) | |
| 45 | | | 5-13-21 (34) | |
| 50 | | | 9-19-21 (40) | |
| 55 | | | 12-15-16 (31) | |
| | | | | Total Depth - 55 feet bgs |

WELL DIAGRAM




MW2 TO 40 FT BV - - 11/21/08 16:34 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY_OLW.GPJ

# *Appendix C*
# *Location and Elevation Survey Data*

*Well Elevations Data Summary Table*
*MVSC/Harris Properties*
*Normandy Park, WA*

| Well | Ground | Case | Top |
|---|---|---|---|
| DC-01 | 313.30 | 313.33 | 312.72 |
| DC-02 | 313.76 | 313.73 | 313.04 |
| DC-03 | 313.83 | 313.81 | 313.23 |
| DC-07 | 303.44 | 303.45 | 302.78 |
| DC-08 | 306.87 | 306.85 | 306.38 |
| DC-09 | 313.11 | 313.08 | 312.47 |
| DC-09A | 308.59 | 308.60 | 308.02 |
| DC-09B | 308.49 | 308.49 | 308.16 |
| DC-10B | 308.29 | 308.34 | 307.89 |
| DC-19 | 313.77 | 313.81 | 313.53 |
| MW-08 | 281.15 | 281.16 | 280.08 |
| MW-09 | 285.48 | 285.48 | 285.11 |

*Compiled Survey Data Summary Table*
*MVSC/Harris Properties*
*Normandy Park, WA*

| Location | Northing | Easting | Ground Elevation (ft msl) | TOC Elevation (ft msl) |
|---|---|---|---|---|
| MW-8 | 165681.2 | 1268349.8 | 281.16 | 280.08 |
| MW-9 | 166019.8 | 1268663.9 | 285.48 | 285.11 |
| DC-01 | | | 313.33 | 312.72 |
| DC-02 | | | 313.73 | 313.04 |
| DC-03 | | | 313.81 | 313.23 |
| DC-07 | | | 303.45 | 302.78 |
| DC-08 | | | 306.85 | 306.38 |
| DC-09a | | | 308.60 | 308.02 |
| DC-09b | | | 308.49 | 308.16 |
| DC-10b | | | 308.34 | 307.89 |
| DC-19 | | | 313.81 | 313.53 |

**Notes:**
Horizontal Datum: WSRN (Washington State Reference Network) using GPS.
Vertical Datum: WSDOT monument # GP17509-167 (NAVD 88)

*Well Summary Data Summary Table*
*MVSC/Harris Properties*
*Normandy Park, WA*

| Well# | North(usft) | East(usft) | Elev(usft) |
|---|---|---|---|
| DC-1 | | | 313.32 |
| DC-2 | | | 313.70 |
| DC-3 | | | 313.77 |
| DC-4 | | | 313.08 |
| CD-7 | | | 303.48 |
| DC-8 | | | 306.87 |
| DC-9A | | | 308.58 |
| DC-9B | | | 308.49 |
| DC-10 | | | 308.33 |
| DC-19 | | | 313.80 |
| MW-8 | 165681.2 | 1268349.8 | 301.05 |
| MW-9 | 166019.8 | 1268663.9 | 285.46 |

**Notes:**
Horizontal Datum: WSRN (Washington State Reference Network) using GPS.
Vertical Datum: WSDOT monument # GP17509-167 (NAVD 88)

ERM - MANHATTAN VILLAGE, NORMANDY PARK
JOB. NO.: 98299.04
DATE OF SURVEY: APRIL 14, 29, 2008

BUSH, ROED & HITCHINGS, INC.
2009 MINOR AVE E TEL. 206.323.4144
SEATTLE, WA 98102

| | GRID | GRID | TOP LID NORTH | TOP PIPE NORTH | | TOP LID NORTH | TOP PIPE NORTH |
|---|---|---|---|---|---|---|---|
| | NAD 83/91 | NAD 83/91 | NAVD 88 | NAVD 88 | | NORMANDY PARK | NORMANDY PARK |
| STATION | NORTHING | EASTING | ELEVATION | ELEVATION | | ELEVATION | ELEVATION |
| B-5 | 164828.2 | 1268482.3 | 311.13 | | | 307.13 | |
| B-6 | 164854.8 | 1268513.6 | 312.17 | | | 308.17 | |
| B-7 | 164964.8 | 1268493.8 | 311.11 | | | 307.11 | |
| B-8 | 164983.8 | 1268506.4 | 311.79 | | | 307.79 | |
| B-9 | 165028.5 | 1268497.5 | 310.66 | | | 306.66 | |
| B-10 | 165049.3 | 1268529.0 | 313.22 | | | 309.22 | |
| B-12 | 165084.0 | 1268602.4 | 308.41 | | | 304.41 | |
| B-13 | 165071.4 | 1268674.6 | 309.15 | | | 305.15 | |
| B-14 | 165058.9 | 1268673.3 | 313.62 | | | 309.62 | |
| B-15 | 165056.4 | 1268623.6 | 313.95 | | | 309.95 | |
| B-16 | 165097.2 | 1268845.5 | 311.56 | | | 307.56 | |
| B-17 | 166019.1 | 1268697.1 | 283.70 | | | 279.70 | |
| B-18 | 166007.6 | 1268892.2 | 285.69 | | | 281.69 | |
| MW-3 | 164857.3 | 1268511.4 | 311.85 | 311.49 | | 307.85 | 307.49 |
| MW-4 | 164968.8 | 1268493.4 | 311.10 | 310.54 | | 307.10 | 306.54 |
| MW-5 | 165331.9 | 1268938.5 | 310.85 | 310.28 | | 306.85 | 306.28 |
| MW-6 | 165615.5 | 1268908.5 | 304.85 | 304.27 | | 300.85 | 300.27 |
| MW-7 | 165652.2 | 1268684.8 | 303.33 | 302.76 | | 299.33 | 298.76 |
| VMP-1 | 164828.2 | 1268482.3 | 311.13 | 310.74 | | 307.13 | 306.74 |
| VMP-2 | 164964.8 | 1268493.8 | 311.11 | 310.81 | | 307.11 | 306.81 |
| VMP-3 | 165028.5 | 1268497.5 | 310.66 | 310.43 | | 306.66 | 306.43 |
| VMP-4 | 165079.3 | 1268533.8 | 307.95 | 307.52 | | 303.95 | 303.52 |
| VMP-5 | 165084.0 | 1268602.4 | 308.41 | 308.07 | | 304.41 | 304.07 |
| VMP-6 | 165071.4 | 1268674.6 | 309.15 | 308.82 | | 305.15 | 304.82 |

HORIZONTAL LOCATION DETERMINED BY GPS SURVEY USING WSRN (WASHINGTON STATE REFERENCE NETWORK)
VERTICAL BENCHMARK: WSDOT STATION GP-17509-166, ELEVATION: 337.06 FEET (NAVD 88)

5/1/08

*Appendix D*
*Waste Manifests*

185184-205 Form Approved. OMB No. 2050-0039

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

**UNIFORM HAZARDOUS WASTE MANIFEST**

1. Generator ID Number: WAH000028116
2. Page 1 of: 1
3. Emergency Response Phone: (800) 326-1011
4. Manifest Tracking Number: 001364561 JJK

**GENERATOR**

5. Generator's Name and Mailing Address
Dr. and Mrs. Harris,
711 South 234th Place
Des Moines, WA 98198
Generator's Phone: 425-462-8591

Generator's Site Address (if different than mailing address)
Dr. and Mrs. Harris,
17817-17825, 17835 1st Ave S.
Normandy Park, WA 98148

6. Transporter 1 Company Name: General Environmental Management, Inc.
U.S. EPA ID Number: CAD983649880

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

8. Designated Facility Name and Site Address
U.S. Ecology Corp.
Highway 95 - 12 miles south of Beatty
Beatty, NV 89003
Facility's Phone: 800 239 3943
U.S. EPA ID Number: NVT330010000

| 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 | | |
|---|---|---|---|---|---|---|---|---|
| X | 1. RQ NA3077 Hazardous waste, solid, n.o.s., 9, III (Tetrachloroethene) (RQ-100 F002) | 11 | DM | 6050 | P | F002 | | |
| X | 2. RQ NA3082 Hazardous Waste, liquid, n.o.s., 9, III (Tetrachloroethene) (RQ-100 F002) | 5 | DM | 275 | G | F002 | | |
| | 3. | | | | | | | |
| | 4. | | | | | | | |

14. Special Handling Instructions and Additional Information
1) 070154647-0 ERG: 171 F002 Soils meeting treatment standards
2) 070154649-0 ERG: 171 F002 Water meeting treatment standards

GEM PO#_____

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: Linda C Harris
Signature: Linda C Harris
Month: 10 Day: 23 Year: 08

**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
Transporter 1 Printed/Typed Name: Steven C Hall
Signature: Steven C Hall
Month: 10 Day: 23 Year: 08

Transporter 2 Printed/Typed Name
Signature
Month: Day: Year:

**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:

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

# NON-HAZARDOUS WASTE MANIFEST

185184-205

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

**NON-HAZARDOUS WASTE MANIFEST**

1. Generator's US EPA ID No.: WAH000028116

Manifest Document No.: 185184a

2. Page 1 of 1

3. Generator's Name and Mailing Address
Dr. and Mrs. Harris,
711 South 234th Place,
Des Moines, WA 98198

4. Generator's Phone ( ): 425-462-8591

5. Transporter 1 Company Name: General Environmental Management, Inc.

6. US EPA ID Number: CAD983649880

7. Transporter 2 Company Name

8. US EPA ID Number

9. Designated Facility Name and Site Address
U.S. Ecology Corp.
Highway 95 - 12 miles south of Beatty
Beatty, NV 89003

10. US EPA ID Number: NVT330010000

A. State Transporter's ID

B. Transporter 1 Phone: ~~800-326-1011~~

C. State Transporter's ID

D. Transporter 2 Phone

E. State Facility's ID

F. Facility's Phone: 800 239 3943

| 11. WASTE DESCRIPTION | 12. Containers No. | 12. Containers Type | 13. Total Quantity | 14. Unit Wt./Vol. |
|---|---|---|---|---|
| a. Non hazardous solid (Soils) | 16 | DM | 10400 | P |
| b. | | | | |
| c. | | | | |
| d. | | | | |

G. Additional Descriptions for Materials Listed Above
1) 070128043-829 Non Regulated Soils

GEM PO#_____

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Emergency Phone: (800) 326-1011
Harris Property - Dr. and Mrs. Harris,
17817-17825, 17835 1st Ave S.
Normandy Park, WA 98148

**GENERATOR**

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name: Linda C Harris
Signature: Linda C Harris
Date: Month 10 Day 23 Year 08

**TRANSPORTER**

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Steven C Hall
Signature
Date: Month 10 Day 23 Year 08

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Year

**FACILITY**

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.
Printed/Typed Name
Signature
Date: Month Day Year

NON-HAZARDOUS WASTE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# NON-HAZARDOUS WASTE MANIFEST

185184-205

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

NON-HAZARDOUS WASTE

**GENERATOR**

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAH000028116

Manifest Document No. 185184b

2. Page 1 of 1

3. Generator's Name and Mailing Address
Dr. and Mrs. Harris,
711 South 234th Place,
Des Moines, WA 98198

4. Generator's Phone ( 425-462-8591

5. Transporter 1 Company Name: General Environmental Management, Inc.

6. US EPA ID Number: CAD983649880

A. State Transporter's ID

B. Transporter 1 Phone: 800-326-1011

7. Transporter 2 Company Name

8. US EPA ID Number

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
Emerald Petroleum Services
1500 Airport Way S.
Seattle, WA 98134

10. US EPA ID Number: WAD058367152

E. State Facility's ID

F. Facility's Phone: 206-832-3100

| 11. WASTE DESCRIPTION | 12. Containers No. | 12. Containers Type | 13. Total Quantity | 14. Unit Wt./Vol. |
|---|---|---|---|---|
| a. Non hazardous liquid (Water) | 4 | DM | 200 | G |
| b. | | | | |
| c. | | | | |
| d. | | | | |

G. Additional Descriptions for Materials Listed Above
1) GOO501 non regulated water

GEM PO#_____

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Emergency Phone: (800) 326-1011
Harris Property - Dr. and Mrs. Harris,
17817-17825, 17835 1st Ave S.
Normandy Park, WA 98148

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name: Linda C Harris | Signature: Linda C Harris | Date: Month 10 Day 23 Year 08

**TRANSPORTER**

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Steven C Hall | Signature: Steven C Hall | Date: Month 10 Day 23 Year 08

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Date: Month Day Year

**FACILITY**

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name | Signature | Date: Month Day Year

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*Appendix E*
*Analytical Laboratory Data Reports*

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

April 10, 2008

Olivia Williams
ERM-Bellevue
915-118th Avenue S.E., Suite 130
Bellevue, WA 98005

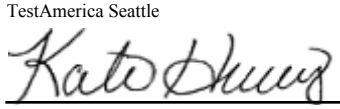
RE: Normandy Park

Enclosed are the results of analyses for samples received by the laboratory on 03/25/08 17:35. The following list is a summary of the Work Orders contained in this report, generated on 04/10/08 17:34.

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

| Work Order | Project | ProjectNumber |
|---|---|---|
| BRC0385 | Normandy Park | 75720 |

TestAmerica Seattle



Kate Haney, Project Manager

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.*

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| B-18 | BRC0385-01 | Water | 03/24/08 12:08 | 03/25/08 17:35 |
| B-14-10 | BRC0385-02 | Soil | 03/24/08 13:11 | 03/25/08 17:35 |
| B-14-20 | BRC0385-03 | Soil | 03/24/08 13:23 | 03/25/08 17:35 |
| B-14-30 | BRC0385-04 | Soil | 03/24/08 13:46 | 03/25/08 17:35 |
| B-15-10 | BRC0385-05 | Soil | 03/24/08 14:14 | 03/25/08 17:35 |
| B-15-20 | BRC0385-06 | Soil | 03/24/08 14:23 | 03/25/08 17:35 |
| B-15-30 | BRC0385-07 | Soil | 03/24/08 14:35 | 03/25/08 17:35 |
| B-10-10 | BRC0385-08 | Soil | 03/24/08 15:11 | 03/25/08 17:35 |
| B-10-20 | BRC0385-09 | Soil | 03/24/08 15:16 | 03/25/08 17:35 |
| B-10-30 | BRC0385-10 | Soil | 03/24/08 15:24 | 03/25/08 17:35 |
| B-16-10 | BRC0385-11 | Soil | 03/25/08 09:01 | 03/25/08 17:35 |
| B-16-20 | BRC0385-12 | Soil | 03/25/08 09:15 | 03/25/08 17:35 |
| B-16-24 | BRC0385-13 | Soil | 03/25/08 09:37 | 03/25/08 17:35 |
| B-9-10 | BRC0385-14 | Soil | 03/25/08 11:00 | 03/25/08 17:35 |
| B-9-20 | BRC0385-15 | Soil | 03/25/08 11:07 | 03/25/08 17:35 |
| B-9-30 | BRC0385-16 | Soil | 03/25/08 11:23 | 03/25/08 17:35 |
| B-7-10 | BRC0385-17 | Soil | 03/25/08 13:01 | 03/25/08 17:35 |
| B-7-20 | BRC0385-18 | Soil | 03/25/08 13:11 | 03/25/08 17:35 |
| B-7-30 | BRC0385-19 | Soil | 03/25/08 13:22 | 03/25/08 17:35 |
| B-6-10 | BRC0385-20 | Soil | 03/25/08 14:25 | 03/25/08 17:35 |
| B-6-20 | BRC0385-21 | Soil | 03/25/08 14:35 | 03/25/08 17:35 |
| B-6-30 | BRC0385-22 | Soil | 03/25/08 15:00 | 03/25/08 17:35 |

TestAmerica Seattle

Kate Haney, Project Manager

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.*

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-01 (B-18)** | | **Water** | | | **Sampled: 03/24/08 12:08** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D01045 | 04/01/08 19:03 | 04/02/08 03:58 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **0.270** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | | *107%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | *103%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | *117%* | | *80 - 120 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-02 (B-14-10)** | | **Soil** | | | **Sampled: 03/24/08 13:11** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.45 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 12:11 | |
| Bromodichloromethane | " | ND | ----- | 2.45 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.45 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 4.90 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.45 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.45 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.45 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.45 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 4.90 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.45 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.45 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.45 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.45 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.45 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.45 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.45 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.45 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.45 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.45 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.45 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.45 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 4.90 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.45 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **11.8** | ----- | 2.45 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.45 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.45 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.45 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.45 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.45 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *108%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *82.4%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *103%* | | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-03 (B-14-20)** | | **Soil** | | | **Sampled: 03/24/08 13:23** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.21 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 12:36 | |
| Bromodichloromethane | " | ND | ----- | 3.21 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.21 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 6.41 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.21 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.21 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.21 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.21 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 6.41 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.21 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.21 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.21 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.21 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.21 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.21 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.21 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.21 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.21 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.21 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.21 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.21 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 6.41 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.21 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **29.6** | ----- | 3.21 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.21 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.21 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.21 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.21 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.21 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *124%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *85.4%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *103%* | | | *60 - 140 %* | " | | | " | |

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BOTHELL, WA 98011-8244
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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-04 (B-14-30)** | | **Soil** | | | **Sampled: 03/24/08 13:46** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.127 | mg/kg dry | 1x | 8D03011 | 04/03/08 15:02 | 04/03/08 21:48 | |
| Bromodichloromethane | " | ND | ----- | 0.127 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.127 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 0.127 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.127 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.127 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 0.127 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.127 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 0.634 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.127 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.127 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.127 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.127 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.127 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.127 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.127 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.127 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.127 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.127 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.127 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.127 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 1.27 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.127 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **0.594** | ----- | 0.127 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.127 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.127 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.127 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.127 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.127 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | | *124%* | | *75 - 125 %* | " | | | " | |
| | *Toluene-d8* | | *104%* | | *75 - 125 %* | " | | | " | |
| | *4-BFB* | | *103%* | | *75 - 125 %* | " | | | " | |

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Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-05 (B-15-10)** | | **Soil** | | | **Sampled: 03/24/08 14:14** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.91 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 13:26 | |
| Bromodichloromethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.83 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.83 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.83 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **5.32** | ----- | 2.91 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.91 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | *112%* | | | *60 - 140 %* | " | | | " | |
| | *Toluene-d8* | *83.5%* | | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | *101%* | | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-06 (B-15-20)** | | **Soil** | | | **Sampled: 03/24/08 14:23** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.89 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 13:52 | I2 |
| Bromodichloromethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.77 | " | " | " | " | " | I2 |
| Carbon tetrachloride | " | ND | ----- | 2.89 | " | " | " | " | " | I2 |
| Chlorobenzene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.89 | " | " | " | " | " | I2 |
| Chloroform | " | ND | ----- | 2.89 | " | " | " | " | " | I2 |
| Chloromethane | " | ND | ----- | 5.77 | " | " | " | " | " | I2 |
| Dibromochloromethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.89 | " | " | " | " | " | I2 |
| 1,2-Dichloroethane | " | ND | ----- | 2.89 | " | " | " | " | " | I2 |
| 1,1-Dichloroethene | " | ND | ----- | 2.89 | " | " | " | " | " | I2 |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.89 | " | " | " | " | " | I2 |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.89 | " | " | " | " | " | I2 |
| 1,2-Dichloropropane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.77 | " | " | " | " | " | I2 |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **18.8** | ----- | 2.89 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.89 | " | " | " | " | " | I2 |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.89 | " | " | " | " | " | I2 |
| *Surrogate(s):* *1,2-DCA-d4* | | *115%* | | | *60 - 140 %* | " | | | " | *I2* |
| *Toluene-d8* | | *83.9%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *102%* | | | *60 - 140 %* | " | | | " | |

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|---|---|---|---|
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| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-07 (B-15-30)** | | **Soil** | | | **Sampled: 03/24/08 14:35** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.15 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 14:17 | |
| Bromodichloromethane | " | ND | ----- | 3.15 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.15 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 6.30 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.15 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.15 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.15 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.15 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 6.30 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.15 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.15 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.15 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.15 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.15 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.15 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.15 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.15 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.15 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.15 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.15 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.15 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 6.30 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.15 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **7.85** | ----- | 3.15 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.15 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.15 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.15 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.15 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.15 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *120%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *82.6%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *104%* | | | *60 - 140 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-08 (B-10-10)** | | **Soil** | | | **Sampled: 03/24/08 15:11** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.156 | mg/kg dry | 1x | 8D03011 | 04/03/08 15:02 | 04/03/08 22:15 | |
| Bromodichloromethane | " | ND | ----- | 0.156 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.156 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 0.156 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.156 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.156 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 0.156 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.156 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 0.782 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.156 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.156 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.156 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.156 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.156 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.156 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.156 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.156 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.156 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.156 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.156 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.156 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 1.56 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.156 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **0.671** | ----- | 0.156 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.156 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.156 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.156 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.156 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.156 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *118%* | | *75 - 125 %* | " | | | " | |
| *Toluene-d8* | | | *103%* | | *75 - 125 %* | " | | | " | |
| *4-BFB* | | | *100%* | | *75 - 125 %* | " | | | " | |

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-09 (B-10-20)** | | **Soil** | | | **Sampled: 03/24/08 15:16** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.16 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 15:08 | |
| Bromodichloromethane | " | ND | ----- | 3.16 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.16 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 6.33 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.16 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.16 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.16 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.16 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 6.33 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.16 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.16 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.16 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.16 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.16 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.16 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.16 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.16 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.16 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.16 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.16 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.16 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 6.33 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.16 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **50.8** | ----- | 3.16 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.16 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.16 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.16 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.16 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.16 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *118%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *81.6%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *102%* | | | *60 - 140 %* | " | | | " | |

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-10 (B-10-30)** | | **Soil** | | | **Sampled: 03/24/08 15:24** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.00 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 15:58 | |
| Bromodichloromethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 6.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 6.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 6.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **15.4** | ----- | 3.00 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.00 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *113%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *81.1%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *101%* | | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-11 (B-16-10)** | | **Soil** | | | **Sampled: 03/25/08 09:01** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.24 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 16:23 | |
| Bromodichloromethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 6.48 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 6.48 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 6.48 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.24 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *116%* | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | | *80.6%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *101%* | | *60 - 140 %* | " | | | " | |

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-12 (B-16-20)** | | **Soil** | | | **Sampled: 03/25/08 09:15** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.24 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 16:49 | |
| Bromodichloromethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 6.49 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 6.49 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 6.49 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.24 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.24 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *114%* | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | | *80.7%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *105%* | | *60 - 140 %* | " | | | " | |

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-13 (B-16-24)** | | **Soil** | | | **Sampled: 03/25/08 09:37** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.139 | mg/kg dry | 1x | 8D03011 | 04/03/08 15:02 | 04/03/08 22:42 | |
| Bromodichloromethane | " | ND | ----- | 0.139 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.139 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 0.139 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.139 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.139 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 0.139 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.139 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 0.697 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.139 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.139 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.139 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.139 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.139 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.139 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.139 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.139 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.139 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.139 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.139 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.139 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 1.39 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.139 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 0.139 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.139 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.139 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.139 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.139 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.139 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *117%* | | *75 - 125 %* | " | | | " | |
| *Toluene-d8* | | | *102%* | | *75 - 125 %* | " | | | " | |
| *4-BFB* | | | *103%* | | *75 - 125 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-14 (B-9-10)** | | **Soil** | | | **Sampled: 03/25/08 11:00** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.45 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 17:39 | |
| Bromodichloromethane | " | ND | ----- | 3.45 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.45 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 6.91 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.45 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.45 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.45 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.45 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 6.91 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.45 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.45 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.45 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.45 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.45 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.45 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.45 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.45 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.45 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.45 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.45 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.45 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 6.91 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.45 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **6.16** | ----- | 3.45 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.45 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.45 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.45 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.45 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.45 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *116%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *81.6%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *100%* | | | *60 - 140 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-15 (B-9-20)** | | **Soil** | | | **Sampled: 03/25/08 11:07** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.35 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 18:05 | |
| Bromodichloromethane | " | ND | ----- | 3.35 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.35 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 6.69 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.35 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.35 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.35 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.35 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 6.69 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.35 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.35 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.35 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.35 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.35 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.35 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.35 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.35 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.35 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.35 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.35 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.35 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 6.69 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.35 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **14.3** | ----- | 3.35 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.35 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.35 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.35 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.35 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.35 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *118%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *78.8%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *101%* | | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-16 (B-9-30)** | | **Soil** | | | **Sampled: 03/25/08 11:23** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.50 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 18:30 | |
| Bromodichloromethane | " | ND | ----- | 3.50 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.50 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 7.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.50 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.50 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.50 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.50 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 7.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.50 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.50 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.50 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.50 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.50 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.50 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.50 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.50 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.50 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.50 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.50 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.50 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 7.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.50 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **11.6** | ----- | 3.50 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.50 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.50 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.50 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.50 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.50 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *118%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *78.0%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *101%* | | | *60 - 140 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-17 (B-7-10)** | | **Soil** | | | **Sampled: 03/25/08 13:01** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.151 | mg/kg dry | 1x | 8D03011 | 04/03/08 15:02 | 04/03/08 23:09 | |
| Bromodichloromethane | " | ND | ----- | 0.151 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.151 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 0.151 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.151 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.151 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 0.151 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.151 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 0.757 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.151 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.151 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.151 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.151 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.151 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.151 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.151 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.151 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.151 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.151 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.151 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.151 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 1.51 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.151 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 0.151 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.151 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.151 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.151 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.151 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.151 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *120%* | | *75 - 125 %* | " | | | " | |
| *Toluene-d8* | | | *105%* | | *75 - 125 %* | " | | | " | |
| *4-BFB* | | | *97.4%* | | *75 - 125 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-18 (B-7-20)** | | **Soil** | | | **Sampled: 03/25/08 13:11** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.39 | ug/kg dry | 1x | 8D01005 | 04/01/08 08:17 | 04/01/08 19:21 | |
| Bromodichloromethane | " | ND | ----- | 3.39 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.39 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 6.78 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.39 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.39 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.39 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.39 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 6.78 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.39 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.39 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.39 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.39 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.39 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.39 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.39 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.39 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.39 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.39 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.39 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.39 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 6.78 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.39 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **3.51** | ----- | 3.39 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.39 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.39 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.39 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.39 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.39 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *119%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *80.6%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *99.6%* | | | *60 - 140 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-19 (B-7-30)** | | **Soil** | | | **Sampled: 03/25/08 13:22** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.89 | ug/kg dry | 1x | 8D08035 | 04/08/08 13:16 | 04/08/08 16:18 | |
| Bromodichloromethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.78 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.78 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.78 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **8.84** | ----- | 2.89 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.89 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.89 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | *137%* | | | *60 - 140 %* | " | | | " | |
| | *Toluene-d8* | *94.4%* | | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | *106%* | | | *60 - 140 %* | " | | | " | |

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-20 (B-6-10)** | | **Soil** | | | **Sampled: 03/25/08 14:25** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.02 | ug/kg dry | 1x | 8D08035 | 04/08/08 13:16 | 04/08/08 20:06 | |
| Bromodichloromethane | " | ND | ----- | 3.02 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.02 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 6.05 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.02 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.02 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.02 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.02 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 6.05 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.02 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.02 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.02 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.02 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.02 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.02 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.02 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.02 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.02 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.02 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.02 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.02 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 6.05 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.02 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 3.02 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.02 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.02 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.02 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.02 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.02 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *137%* | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | | *88.5%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *97.8%* | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-21 (B-6-20)** | | **Soil** | | | **Sampled: 03/25/08 14:35** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.77 | ug/kg dry | 1x | 8D08035 | 04/08/08 13:16 | 04/08/08 17:08 | |
| Bromodichloromethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.55 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.55 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.55 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **8.16** | ----- | 2.77 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.77 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *136%* | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | | *94.2%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *101%* | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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|---|---|---|---|
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| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-22 (B-6-30)** | | **Soil** | | | **Sampled: 03/25/08 15:00** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.13 | ug/kg dry | 1x | 8D08035 | 04/08/08 13:16 | 04/08/08 17:34 | |
| Bromodichloromethane | " | ND | ----- | 3.13 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.13 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 6.26 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.13 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.13 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.13 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.13 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 6.26 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.13 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.13 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.13 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.13 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.13 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.13 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.13 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.13 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.13 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.13 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.13 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.13 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 6.26 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.13 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **8.99** | ----- | 3.13 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.13 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.13 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.13 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.13 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.13 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *138%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *91.6%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *101%* | | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Physical Parameters by APHA/ASTM/EPA Methods

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-02 (B-14-10)** | | **Soil** | | | | **Sampled: 03/24/08 13:11** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **80.8** | ----- | 1.00 | % | 1x | 8C28031 | 03/28/08 14:03 | 03/31/08 00:00 | |
| **BRC0385-03 (B-14-20)** | | **Soil** | | | | **Sampled: 03/24/08 13:23** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **89.3** | ----- | 1.00 | % | 1x | 8C28031 | 03/28/08 14:03 | 03/31/08 00:00 | |
| **BRC0385-04 (B-14-30)** | | **Soil** | | | | **Sampled: 03/24/08 13:46** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **93.9** | ----- | 1.00 | % | 1x | 8C28031 | 03/28/08 14:03 | 03/31/08 00:00 | |
| **BRC0385-05 (B-15-10)** | | **Soil** | | | | **Sampled: 03/24/08 14:14** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **83.8** | ----- | 1.00 | % | 1x | 8C28031 | 03/28/08 14:03 | 03/31/08 00:00 | |
| **BRC0385-06 (B-15-20)** | | **Soil** | | | | **Sampled: 03/24/08 14:23** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **82.6** | ----- | 1.00 | % | 1x | 8C28031 | 03/28/08 14:03 | 03/31/08 00:00 | |
| **BRC0385-07 (B-15-30)** | | **Soil** | | | | **Sampled: 03/24/08 14:35** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **96.6** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-08 (B-10-10)** | | **Soil** | | | | **Sampled: 03/24/08 15:11** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **95.1** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-09 (B-10-20)** | | **Soil** | | | | **Sampled: 03/24/08 15:16** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **95.3** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-10 (B-10-30)** | | **Soil** | | | | **Sampled: 03/24/08 15:24** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **97.0** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-11 (B-16-10)** | | **Soil** | | | | **Sampled: 03/25/08 09:01** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **89.5** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-12 (B-16-20)** | | **Soil** | | | | **Sampled: 03/25/08 09:15** | | | | |

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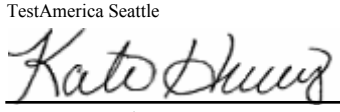

Kate Haney, Project Manager

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| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Physical Parameters by APHA/ASTM/EPA Methods

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-12 (B-16-20)** | | **Soil** | | | | **Sampled: 03/25/08 09:15** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **77.7** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-13 (B-16-24)** | | **Soil** | | | | **Sampled: 03/25/08 09:37** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **96.0** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-14 (B-9-10)** | | **Soil** | | | | **Sampled: 03/25/08 11:00** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **95.3** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-15 (B-9-20)** | | **Soil** | | | | **Sampled: 03/25/08 11:07** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **96.2** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-16 (B-9-30)** | | **Soil** | | | | **Sampled: 03/25/08 11:23** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **97.9** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-17 (B-7-10)** | | **Soil** | | | | **Sampled: 03/25/08 13:01** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **94.2** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-18 (B-7-20)** | | **Soil** | | | | **Sampled: 03/25/08 13:11** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **94.5** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-19 (B-7-30)** | | **Soil** | | | | **Sampled: 03/25/08 13:22** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **78.2** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-20 (B-6-10)** | | **Soil** | | | | **Sampled: 03/25/08 14:25** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **97.5** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-21 (B-6-20)** | | **Soil** | | | | **Sampled: 03/25/08 14:35** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **80.5** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |
| **BRC0385-22 (B-6-30)** | | **Soil** | | | | **Sampled: 03/25/08 15:00** | | | | |

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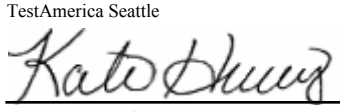

Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Physical Parameters by APHA/ASTM/EPA Methods

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| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0385-22 (B-6-30)** | | **Soil** | | | | | | **Sampled: 03/25/08 15:00** | | |
| **Dry Weight** | BSOPSPL003R08 | **87.8** | ----- | 1.00 | % | 1x | 8C28032 | 03/28/08 14:05 | 03/31/08 00:00 | |

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|---|---|---|---|
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| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method) - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D01005** **Soil Preparation Method: EPA 5035**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D01005-BLK1)** | | | | | | | **Extracted: 04/01/08 08:17** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 5.00 | ug/kg wet | 1x | -- | -- | -- | -- | -- | -- | 04/01/08 09:34 | |
| Bromodichloromethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 10.0 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 10.0 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 10.0 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 104%* | | | *Limits: 60-140%* | " | | | | | | | *04/01/08 09:34* | |
| *Toluene-d8* | | *96.7%* | | | *60-140%* | " | | | | | | | *"* | |
| *4-BFB* | | *101%* | | | *60-140%* | " | | | | | | | *"* | |

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method) - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D01005** **Soil Preparation Method: EPA 5035**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LCS (8D01005-BS1)** | | | | | | | **Extracted: 04/01/08 08:17** | | | | | | | |
| Bromochloromethane | EPA 8260B | 57.9 | --- | 5.00 | ug/kg wet | 1x | -- | 50.0 | 116% | (75-125) | -- | -- | 04/01/08 08:43 | |
| Chlorobenzene | " | 45.8 | --- | 5.00 | " | " | -- | " | 91.5% | (70-130) | -- | -- | " | |
| 1,1-Dichloroethene | " | 55.0 | --- | 5.00 | " | " | -- | " | 110% | " | -- | -- | " | |
| Trichloroethene | " | 50.8 | --- | 5.00 | " | " | -- | " | 102% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 98.4%* | | | *Limits: 60-140%* | " | | | | | | | *04/01/08 08:43* | |
| *Toluene-d8* | | *98.1%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *99.2%* | | | *60-140%* | " | | | | | | | " | |
| **LCS Dup (8D01005-BSD1)** | | | | | | | **Extracted: 04/01/08 08:17** | | | | | | | |
| Bromochloromethane | EPA 8260B | 60.1 | --- | 5.00 | ug/kg wet | 1x | -- | 50.0 | 120% | (75-125) | 3.64% | (30) | 04/01/08 09:09 | |
| Chlorobenzene | " | 46.6 | --- | 5.00 | " | " | -- | " | 93.1% | (70-130) | 1.73% | " | " | |
| 1,1-Dichloroethene | " | 50.0 | --- | 5.00 | " | " | -- | " | 100% | " | 9.58% | " | " | |
| Trichloroethene | " | 49.3 | --- | 5.00 | " | " | -- | " | 98.5% | " | 3.04% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 95.2%* | | | *Limits: 60-140%* | " | | | | | | | *04/01/08 09:09* | |
| *Toluene-d8* | | *99.8%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *101%* | | | *60-140%* | " | | | | | | | " | |

**QC Batch: 8D01045** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D01045-BLK1)** | | | | | | | **Extracted: 04/01/08 19:03** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 0.250 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 04/02/08 01:54 | |
| Bromodichloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 0.250 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | 0.260 | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | **B** |
| 1,3-Dichlorobenzene | " | 0.210 | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | **B** |
| 1,4-Dichlorobenzene | " | 0.270 | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | **B** |
| 1,1-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D01045** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D01045-BLK1)** | | | | | | | | | **Extracted: 04/01/08 19:03** | | | | | |
| trans-1,2-Dichloroethene | EPA 8260B | ND | --- | 0.200 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 04/02/08 01:54 | |
| 1,2-Dichloropropane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 88.8%* | | | *Limits: 76-138%* | " | | | | | | | *04/02/08 01:54* | |
| *Toluene-d8* | | *107%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *118%* | | | *80-120%* | " | | | | | | | " | |
| **LCS (8D01045-BS1)** | | | | | | | | | **Extracted: 04/01/08 19:03** | | | | | |
| Chlorobenzene | EPA 8260B | 37.8 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 94.6% | (80-120) | -- | -- | 04/01/08 23:40 | |
| 1,1-Dichloroethene | " | 36.2 | --- | 0.200 | " | " | -- | " | 90.5% | " | -- | -- | " | |
| Trichloroethene | " | 39.0 | --- | 0.200 | " | " | -- | " | 97.6% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 96.7%* | | | *Limits: 76-138%* | " | | | | | | | *04/01/08 23:40* | |
| *Toluene-d8* | | *97.6%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *94.6%* | | | *80-120%* | " | | | | | | | " | |
| **LCS Dup (8D01045-BSD1)** | | | | | | | | | **Extracted: 04/01/08 19:03** | | | | | |
| Chlorobenzene | EPA 8260B | 37.0 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 92.4% | (80-120) | 2.30% | (20) | 04/02/08 00:09 | |
| 1,1-Dichloroethene | " | 35.2 | --- | 0.200 | " | " | -- | " | 88.0% | " | 2.86% | " | " | |
| Trichloroethene | " | 38.4 | --- | 0.200 | " | " | -- | " | 96.0% | " | 1.58% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 95.6%* | | | *Limits: 76-138%* | " | | | | | | | *04/02/08 00:09* | |
| *Toluene-d8* | | *96.9%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *95.2%* | | | *80-120%* | " | | | | | | | " | |

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D03011** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D03011-BLK1)** | | | | | | | **Extracted: 04/03/08 08:02** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 0.100 | mg/kg wet | 1x | -- | -- | -- | -- | -- | -- | 04/03/08 13:04 | |
| Bromodichloromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 112%* | | | *Limits: 75-125%* | " | | | | | | | *04/03/08 13:04* | |
| *Toluene-d8* | | *103%* | | | *75-125%* | " | | | | | | | *"* | |
| *4-BFB* | | *104%* | | | *75-125%* | " | | | | | | | *"* | |

TestAmerica Seattle

Kate Haney, Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D03011** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LCS (8D03011-BS1)** | | | | | | | **Extracted: 04/03/08 08:02** | | | | | | | |
| Chlorobenzene | EPA 8260B | 3.72 | --- | 0.100 | mg/kg wet | 1x | -- | 4.00 | 93.0% | (75-125) | -- | -- | 04/03/08 12:00 | |
| 1,1-Dichloroethene | " | 4.06 | --- | 0.100 | " | " | -- | " | 101% | (69-128) | -- | -- | " | |
| Trichloroethene | " | 3.76 | --- | 0.100 | " | " | -- | " | 94.0% | (75-125) | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 109%* | | | *Limits: 75-125%* | " | | | | | | | *04/03/08 12:00* | |
| *Toluene-d8* | | *102%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *100%* | | | *75-125%* | " | | | | | | | " | |
| **LCS Dup (8D03011-BSD1)** | | | | | | | **Extracted: 04/03/08 08:02** | | | | | | | |
| Chlorobenzene | EPA 8260B | 3.67 | --- | 0.100 | mg/kg wet | 1x | -- | 4.00 | 91.7% | (75-125) | 1.33% | (20) | 04/03/08 12:27 | |
| 1,1-Dichloroethene | " | 4.24 | --- | 0.100 | " | " | -- | " | 106% | (69-128) | 4.53% | " | " | |
| Trichloroethene | " | 4.06 | --- | 0.100 | " | " | -- | " | 102% | (75-125) | 7.70% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 117%* | | | *Limits: 75-125%* | " | | | | | | | *04/03/08 12:27* | |
| *Toluene-d8* | | *96.8%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *99.7%* | | | *75-125%* | " | | | | | | | " | |

**QC Batch: 8D08035** **Soil Preparation Method: EPA 5035**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D08035-BLK1)** | | | | | | | **Extracted: 04/08/08 13:16** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 5.00 | ug/kg wet | 1x | -- | -- | -- | -- | -- | -- | 04/08/08 15:02 | |
| Bromodichloromethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 10.0 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 10.0 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method) - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D08035** **Soil Preparation Method: EPA 5035**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D08035-BLK1)** | | | | | | | | | **Extracted: 04/08/08 13:16** | | | | | |
| cis-1,3-Dichloropropene | EPA 8260B | ND | --- | 5.00 | ug/kg wet | 1x | -- | -- | -- | -- | -- | -- | 04/08/08 15:02 | |
| trans-1,3-Dichloropropene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 10.0 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 122%* | | | *Limits: 60-140%* | " | | | | | | | *04/08/08 15:02* | |
| *Toluene-d8* | | *94.6%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *99.6%* | | | *60-140%* | " | | | | | | | " | |
| **LCS (8D08035-BS1)** | | | | | | | | | **Extracted: 04/08/08 13:16** | | | | | |
| Bromochloromethane | EPA 8260B | 54.5 | --- | 5.00 | ug/kg wet | 1x | -- | 50.0 | 109% | (75-125) | -- | -- | 04/08/08 13:38 | |
| Chlorobenzene | " | 47.5 | --- | 5.00 | " | " | -- | " | 94.9% | (70-130) | -- | -- | " | |
| 1,1-Dichloroethene | " | 54.7 | --- | 5.00 | " | " | -- | " | 109% | " | -- | -- | " | |
| Trichloroethene | " | 49.2 | --- | 5.00 | " | " | -- | " | 98.5% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 102%* | | | *Limits: 60-140%* | " | | | | | | | *04/08/08 13:38* | |
| *Toluene-d8* | | *101%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *99.6%* | | | *60-140%* | " | | | | | | | " | |
| **LCS Dup (8D08035-BSD1)** | | | | | | | | | **Extracted: 04/08/08 13:16** | | | | | |
| Bromochloromethane | EPA 8260B | 61.2 | --- | 5.00 | ug/kg wet | 1x | -- | 50.0 | 122% | (75-125) | 11.6% | (30) | 04/08/08 14:35 | |
| Chlorobenzene | " | 48.8 | --- | 5.00 | " | " | -- | " | 97.6% | (70-130) | 2.78% | " | " | |
| 1,1-Dichloroethene | " | 56.3 | --- | 5.00 | " | " | -- | " | 113% | " | 2.87% | " | " | |
| Trichloroethene | " | 53.0 | --- | 5.00 | " | " | -- | " | 106% | " | 7.41% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 102%* | | | *Limits: 60-140%* | " | | | | | | | *04/08/08 14:35* | |
| *Toluene-d8* | | *96.7%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *99.7%* | | | *60-140%* | " | | | | | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Physical Parameters by APHA/ASTM/EPA Methods - Laboratory Quality Control Results

TestAmerica Seattle

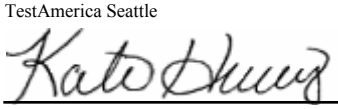
**QC Batch: 8C28031** **Soil Preparation Method: Dry Weight**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8C28031-BLK1)** | | | | | | | | | | | | | **Extracted: 03/28/08 14:03** | |
| Dry Weight | BSOPSPL00 3R08 | 100 | --- | 1.00 | % | 1x | -- | -- | -- | -- | -- | -- | 03/31/08 00:00 | |

**QC Batch: 8C28032** **Soil Preparation Method: Dry Weight**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8C28032-BLK1)** | | | | | | | | | | | | | **Extracted: 03/28/08 14:05** | |
| Dry Weight | BSOPSPL00 3R08 | 100 | --- | 1.00 | % | 1x | -- | -- | -- | -- | -- | -- | 03/31/08 00:00 | |

TestAmerica Seattle



Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/10/08 17:34 |

## Notes and Definitions

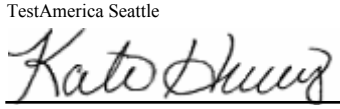
Report Specific Notes:

| | | |
|---|---|---|
| B | - | Analyte was detected in the associated Method Blank. |
| I2 | - | Internal Standard recovery was outside of method limits. |

Laboratory Reporting Conventions:

| | | |
|---|---|---|
| DET | - | Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only. |
| ND | - | Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate). |
| NR/NA | - | Not Reported / Not Available |
| dry | - | Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight. |
| wet | - | Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis. |
| RPD | - | RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries). |
| MRL | - | METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table. |
| MDL* | - | METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results. |
| Dil | - | Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data. |
| Reporting Limits | - | Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable. |
| Electronic Signature | - | Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature. |

TestAmerica Seattle



Kate Haney, Project Manager

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9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


# CHAIN OF CUSTODY REPORT

**Work Order #:** BRC0385

CLIENT: ERM

REPORT TO:
ADDRESS: 915 118th Ave SE Suite 130 Bellevue WA 98005
PHONE: 425-462-8591 FAX: 425-455-3573

INVOICE TO:

P.O. NUMBER:

PROJECT NAME: Normandy Park
PROJECT NUMBER: 75720
SAMPLED BY: Kevin Kneseck

**TURNAROUND REQUEST**
in Business Days *
Organic & Inorganic Analyses: 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE

REQUESTED ANALYSES: CVOC, 8260B, VSK

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|
| 1 | B-18 | 3/24/08 1208 | W | 3 | | -01 |
| 2 | B-14-10 | 3/24/08 1311 | S | 4 | | -02 |
| 3 | B-14-20 | 3/24/08 1323 | S | 4 | | -03 |
| 4 | B-14-30 | 3/24/08 1346 | S | 4 | | -04 |
| 5 | B-15-10 | 3/24/08 1414 | S | 4 | | -05 |
| 6 | B-15-20 | 3/24/08 1423 | S | 4 | | -06 |
| 7 | B-15-30 | " " 1435 | S | 4 | | -07 |
| 8 | B-10-10 | " " 1511 | S | 4 | | -08 |
| 9 | B-10-20 | " " 1516 | S | 4 | | -09 |
| 10 | B-10-30 | " " 1524 | S | 4 | | -10 |

RELEASED BY: [signature]
PRINT NAME: Kevin Kneseck FIRM: ERM DATE: 3/25/08 TIME:

RECEIVED BY: [signature]
PRINT NAME: [signature] FIRM: TA-SEA DATE: 3/25/08 TIME: 1735

RELEASED BY:
PRINT NAME: FIRM: DATE: TIME:

RECEIVED BY:
PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS:

TEMP: 1.6°C



TAL-1000(0108)

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9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


# CHAIN OF CUSTODY REPORT

**Work Order #:** BRC0385

CLIENT:

INVOICE TO:

REPORT TO:
ADDRESS: 915 118th Ave SE Suite 130 Bellevue WA 98005

PHONE: 425-462-8591 FAX: 425-455-3573

P.O. NUMBER:

PROJECT NAME: Normandy Park

PROJECT NUMBER: 75720

SAMPLED BY: Kevin Kreach

**TURNAROUND REQUEST**
in Business Days *

Organic & Inorganic Analyses: [10 STD.] [7] [5] [4] [3] [2] [1] [<1]

Petroleum Hydrocarbon Analyses: [5 STD.] [4] [3] [2] [1] [<1]

[OTHER] Specify:

* *Turnaround Requests less than standard may incur Rush Charges.*

PRESERVATIVE

REQUESTED ANALYSES

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | CVOC 8260B | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|---|
| 1 | B-16-10 | 3/25/08 0901 | ✓ | S | 4 | | -11 |
| 2 | B-16-20 | " " 0915 | ✓ | S | 4 | | -12 |
| 3 | B-16-24 | " " 0937 | ✓ | S | 4 | | -13 |
| 4 | B-9-10 | " " 1100 | ✓ | S | 4 | | -14 |
| 5 | B-9-20 | " " 1107 | ✓ | S | 4 | | -15 |
| 6 | B-9-30 | " " 1123 | ✓ | S | 4 | | -16 |
| 7 | B-7-10 | " " 1301 | ✓ | S | 4 | | -17 |
| 8 | B-7-20 | " " 1311 | ✓ | S | 4 | | -18 |
| 9 | B-7-30 | " " 1322 | ✓ | S | 4 | | -19 |
| 10 | B-6-10 | " " 1425 | ✓ | S | 4 | | -20 |

RELEASED BY: Kevin Kreach — DATE: 3/25/08
PRINT NAME: — FIRM: ERM — TIME:

RECEIVED BY: — DATE: 3/25/08
PRINT NAME: Kreach — FIRM: TA-SEA — TIME: 1735

RELEASED BY: — DATE:
PRINT NAME: — FIRM: — TIME:

RECEIVED BY: — DATE:
PRINT NAME: — FIRM: — TIME:

ADDITIONAL REMARKS:

TEMP: 1.6°C — 5/10



TAL-1000(0108)

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2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


# CHAIN OF CUSTODY REPORT

**Work Order #:** BRC0385

CLIENT:

INVOICE TO:

REPORT TO:
ADDRESS 915 118th Ave SE Suite 130 Bellevue WA 98005

PHONE: 425-462-8591 FAX: 425-455-3573

P.O. NUMBER:

PROJECT NAME: Normandy Park

PROJECT NUMBER: 75720

SAMPLED BY: Kevin Kreach

**TURNAROUND REQUEST**
in Business Days *

Organic & Inorganic Analyses: [X] STD. [7] [5] [4] [3] [2] [1] [<1]

Petroleum Hydrocarbon Analyses: [5] STD. [4] [3] [2] [1] [<1]

[OTHER] Specify:

* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE

REQUESTED ANALYSES

CVOC 8260B

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|
| 1 | B-6-20 | 11 11 1435 | S | 4 | | -21 |
| 2 | B-6-30 | 11 11 1500 | S | 4 | | -22 |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |

RELEASED BY: Kevin Kreach DATE: 3/25/08
PRINT NAME: FIRM: ERM TIME:

RECEIVED BY: DBreach DATE: 3/25/08
PRINT NAME: FIRM: TA-SEA TIME: 1735

RELEASED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

TEMP: 1.6°C



TAL-1000(0108)

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

April 15, 2008

Olivia Williams
ERM-Bellevue
915-118th Avenue S.E., Suite 130
Bellevue, WA 98005

RE: Normandy Park

Enclosed are the results of analyses for samples received by the laboratory on 03/27/08 15:00. The following list is a summary of the Work Orders contained in this report, generated on 04/15/08 14:33.

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

| Work Order | Project | ProjectNumber |
|---|---|---|
| BRC0454 | Normandy Park | 75720 |

TestAmerica Seattle

Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| B-16 | BRC0454-01 | Water | 03/26/08 08:10 | 03/27/08 15:00 |
| B-17-10 | BRC0454-02 | Soil | 03/26/08 09:03 | 03/27/08 15:00 |
| B-17-20 | BRC0454-03 | Soil | 03/26/08 09:10 | 03/27/08 15:00 |
| B-17-30 | BRC0454-04 | Soil | 03/26/08 09:22 | 03/27/08 15:00 |
| B-8-10 | BRC0454-05 | Soil | 03/26/08 10:40 | 03/27/08 15:00 |
| B-8-20 | BRC0454-06 | Soil | 03/26/08 10:48 | 03/27/08 15:00 |
| B-8-30 | BRC0454-07 | Soil | 03/26/08 11:00 | 03/27/08 15:00 |
| B-5-10 | BRC0454-08 | Soil | 03/26/08 12:37 | 03/27/08 15:00 |
| B-5-20 | BRC0454-09 | Soil | 03/26/08 12:48 | 03/27/08 15:00 |
| B-5-30 | BRC0454-10 | Soil | 03/26/08 12:55 | 03/27/08 15:00 |
| B-11-10 | BRC0454-11 | Soil | 03/27/08 08:22 | 03/27/08 15:00 |
| B-11-20 | BRC0454-12 | Soil | 03/27/08 08:30 | 03/27/08 15:00 |
| B-11-30 | BRC0454-13 | Soil | 03/27/08 08:38 | 03/27/08 15:00 |
| B-12-10 | BRC0454-14 | Soil | 03/27/08 09:55 | 03/27/08 15:00 |
| B-12-20 | BRC0454-15 | Soil | 03/27/08 10:00 | 03/27/08 15:00 |
| B-12-25 | BRC0454-16 | Soil | 03/27/08 10:10 | 03/27/08 15:00 |
| B-13-10 | BRC0454-17 | Soil | 03/27/08 10:58 | 03/27/08 15:00 |
| B-13-20 | BRC0454-18 | Soil | 03/27/08 11:05 | 03/27/08 15:00 |
| B-13-26 | BRC0454-19 | Soil | 03/27/08 11:21 | 03/27/08 15:00 |
| B-17 | BRC0454-20 | Water | 03/26/08 10:00 | 03/27/08 15:00 |
| B-8 | BRC0454-21 | Water | 03/26/08 11:20 | 03/27/08 15:00 |
| B-5 | BRC0454-22 | Water | 03/26/08 13:25 | 03/27/08 15:00 |

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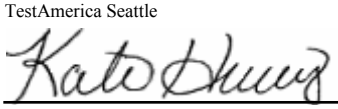

Kate Haney, Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-01 (B-16)** | | **Water** | | | **Sampled: 03/26/08 08:10** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D02051 | 04/03/08 00:14 | 04/03/08 06:37 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **2.60** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | | *103%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | *103%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | *105%* | | *80 - 120 %* | " | | | " | |

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Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-02 (B-17-10)** | | **Soil** | | | **Sampled: 03/26/08 09:03** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.69 | ug/kg dry | 1x | 8D08035 | 04/08/08 13:16 | 04/08/08 20:31 | |
| Bromodichloromethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.37 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.37 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.37 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.69 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *142%* | | *60 - 140 %* | " | | | " | ***Z2*** |
| *Toluene-d8* | | | *86.7%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *98.7%* | | *60 - 140 %* | " | | | " | |

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-03 (B-17-20)** | | **Soil** | | | **Sampled: 03/26/08 09:10** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.51 | ug/kg dry | 1x | 8D08035 | 04/08/08 13:16 | 04/08/08 20:56 | |
| Bromodichloromethane | " | ND | ----- | 2.51 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.51 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.03 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.51 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.51 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.51 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.51 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.03 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.51 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.51 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.51 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.51 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.51 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.51 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.51 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.51 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.51 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.51 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.51 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.51 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.03 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.51 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 2.51 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.51 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.51 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.51 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.51 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.51 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *130%* | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | | *90.4%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *102%* | | *60 - 140 %* | " | | | " | |

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-04 (B-17-30)** | | **Soil** | | | **Sampled: 03/26/08 09:22** | | | | | **I2** |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.44 | ug/kg dry | 1x | 8D08035 | 04/08/08 13:16 | 04/08/08 21:22 | |
| Bromodichloromethane | " | ND | ----- | 2.44 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.44 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 4.88 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.44 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.44 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.44 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.44 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 4.88 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.44 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.44 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.44 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.44 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.44 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.44 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.44 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.44 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.44 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.44 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.44 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.44 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 4.88 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.44 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 2.44 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.44 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.44 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.44 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.44 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.44 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *138%* | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | | *90.5%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *97.1%* | | *60 - 140 %* | " | | | " | |

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| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-05 (B-8-10)** | | **Soil** | | | **Sampled: 03/26/08 10:40** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.69 | ug/kg dry | 1x | 8D08035 | 04/08/08 13:16 | 04/08/08 21:47 | |
| Bromodichloromethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.38 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.38 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.38 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **6.54** | ----- | 2.69 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.69 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *135%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *90.7%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *102%* | | | *60 - 140 %* | " | | | " | |

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-06 (B-8-20)** | | **Soil** | | | **Sampled: 03/26/08 10:48** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 3.00 | ug/kg dry | 1x | 8D09045 | 04/09/08 16:54 | 04/09/08 19:36 | |
| Bromodichloromethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 6.01 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 6.01 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 6.01 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **5.54** | ----- | 3.00 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 3.00 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 3.00 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *134%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *88.7%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *99.9%* | | | *60 - 140 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-07 (B-8-30)** | | **Soil** | | | **Sampled: 03/26/08 11:00** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.91 | ug/kg dry | 1x | 8D08035 | 04/08/08 13:16 | 04/08/08 22:38 | |
| Bromodichloromethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.83 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.83 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.83 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **5.62** | ----- | 2.91 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.91 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.91 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *139%* | | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | *88.8%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *102%* | | | *60 - 140 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-08 (B-5-10)** | | **Soil** | | | **Sampled: 03/26/08 12:37** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.87 | ug/kg dry | 1x | 8D09045 | 04/09/08 16:54 | 04/09/08 20:01 | |
| Bromodichloromethane | " | ND | ----- | 2.87 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.87 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.73 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.87 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.87 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.87 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.87 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.73 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.87 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.87 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.87 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.87 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.87 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.87 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.87 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.87 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.87 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.87 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.87 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.87 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.73 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.87 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 2.87 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.87 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.87 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.87 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.87 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.87 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *152%* | | *60 - 140 %* | " | | | " | ***Z2*** |
| *Toluene-d8* | | | *126%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *101%* | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-09 (B-5-20)** | | **Soil** | | | **Sampled: 03/26/08 12:48** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.93 | ug/kg dry | 1x | 8D08035 | 04/08/08 13:16 | 04/08/08 23:28 | |
| Bromodichloromethane | " | ND | ----- | 2.93 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.93 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.87 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.93 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.93 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.93 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.93 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.87 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.93 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.93 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.93 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.93 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.93 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.93 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.93 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.93 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.93 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.93 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.93 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.93 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.87 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.93 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **3.40** | ----- | 2.93 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.93 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.93 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.93 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.93 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.93 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *141%* | | *60 - 140 %* | " | | | " | ***ZX*** |
| *Toluene-d8* | | | *87.6%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *100%* | | *60 - 140 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-10 (B-5-30)** | | **Soil** | | | **Sampled: 03/26/08 12:55** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.23 | ug/kg dry | 1x | 8D08035 | 04/08/08 13:16 | 04/08/08 23:54 | I2 |
| Bromodichloromethane | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| Bromoform | " | ND | ----- | 2.23 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 4.46 | " | " | " | " | " | I2 |
| Carbon tetrachloride | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| Chlorobenzene | " | ND | ----- | 2.23 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| Chloroform | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| Chloromethane | " | ND | ----- | 4.46 | " | " | " | " | " | I2 |
| Dibromochloromethane | " | ND | ----- | 2.23 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.23 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.23 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.23 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| 1,2-Dichloroethane | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| 1,1-Dichloroethene | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| 1,2-Dichloropropane | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.23 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 4.46 | " | " | " | " | " | I2 |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.23 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **8.88** | ----- | 2.23 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.23 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| Trichlorofluoromethane | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| Vinyl chloride | " | ND | ----- | 2.23 | " | " | " | " | " | I2 |
| *Surrogate(s):* *1,2-DCA-d4* | | *129%* | | | *60 - 140 %* | " | | | " | *I2* |
| *Toluene-d8* | | *86.0%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *100%* | | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-11 (B-11-10)** | | **Soil** | | | **Sampled: 03/27/08 08:22** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.68 | ug/kg dry | 1x | 8D09045 | 04/09/08 16:54 | 04/09/08 20:52 | |
| Bromodichloromethane | " | ND | ----- | 2.68 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.68 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.36 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.68 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.68 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.68 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.68 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.36 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.68 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.68 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.68 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.68 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.68 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.68 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.68 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.68 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.68 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.68 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.68 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.68 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.36 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.68 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **32.4** | ----- | 2.68 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.68 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.68 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.68 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.68 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.68 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *142%* | | *60 - 140 %* | " | | | " | ***Z2*** |
| *Toluene-d8* | | | *129%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *102%* | | *60 - 140 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-12 (B-11-20)** | | **Soil** | | | **Sampled: 03/27/08 08:30** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 168 | ug/kg dry | 1x | 8D10049 | 04/10/08 15:50 | 04/10/08 18:05 | |
| Bromodichloromethane | " | ND | ----- | 168 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 168 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 168 | " | " | " | " | " | C5 |
| Carbon tetrachloride | " | ND | ----- | 168 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 168 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 168 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 168 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 840 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 168 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 168 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 168 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 168 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 168 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 168 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 168 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 168 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 168 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 168 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 168 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 168 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 1680 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 168 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **346** | ----- | 168 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 168 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 168 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 168 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 168 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 168 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *97.4%* | | *75 - 125 %* | " | | | " | |
| *Toluene-d8* | | | *98.4%* | | *75 - 125 %* | " | | | " | |
| *4-BFB* | | | *98.2%* | | *75 - 125 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-13 (B-11-30)** | | **Soil** | | | **Sampled: 03/27/08 08:38** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 68.8 | ug/kg dry | 1x | 8D09052 | 04/09/08 18:32 | 04/10/08 15:22 | |
| Bromodichloromethane | " | ND | ----- | 68.8 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 68.8 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 68.8 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 68.8 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 68.8 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 68.8 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 68.8 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 344 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 68.8 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 68.8 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 68.8 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 68.8 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 68.8 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 68.8 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 68.8 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 68.8 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 68.8 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 68.8 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 68.8 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 68.8 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 688 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 68.8 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **279** | ----- | 68.8 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 68.8 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 68.8 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 68.8 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 68.8 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 68.8 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *102%* | | | *75 - 125 %* | " | | | " | |
| *Toluene-d8* | | *97.4%* | | | *75 - 125 %* | " | | | " | |
| *4-BFB* | | *101%* | | | *75 - 125 %* | " | | | " | |

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Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-14 (B-12-10)** | | **Soil** | | | **Sampled: 03/27/08 09:55** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.92 | ug/kg dry | 1x | 8D09045 | 04/09/08 16:54 | 04/09/08 22:08 | |
| Bromodichloromethane | " | ND | ----- | 2.92 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.92 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.84 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.92 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.92 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.92 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.92 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.84 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.92 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.92 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.92 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.92 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.92 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.92 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.92 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.92 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.92 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.92 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.92 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.92 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.84 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.92 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 2.92 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.92 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.92 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.92 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.92 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.92 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *151%* | | *60 - 140 %* | " | | | " | ***Z2*** |
| *Toluene-d8* | | | *128%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *103%* | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-15 (B-12-20)** | | **Soil** | | | **Sampled: 03/27/08 10:00** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.95 | ug/kg dry | 1x | 8D09045 | 04/09/08 16:54 | 04/09/08 22:33 | |
| Bromodichloromethane | " | ND | ----- | 2.95 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.95 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.90 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.95 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.95 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.95 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.95 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.90 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.95 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.95 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.95 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.95 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.95 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.95 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.95 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.95 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.95 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.95 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.95 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.95 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.90 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.95 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **2.99** | ----- | 2.95 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.95 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.95 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.95 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.95 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.95 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | *154%* | | | *60 - 140 %* | " | | | " | ***Z2*** |
| *Toluene-d8* | | *124%* | | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | *102%* | | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-16 (B-12-25)** | | **Soil** | | | **Sampled: 03/27/08 10:10** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.69 | ug/kg dry | 1x | 8D09045 | 04/09/08 16:54 | 04/09/08 22:58 | |
| Bromodichloromethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.38 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.38 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.38 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **8.48** | ----- | 2.69 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.69 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.69 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *150%* | | *60 - 140 %* | " | | | " | ***Z2*** |
| *Toluene-d8* | | | *125%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *105%* | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-17 (B-13-10)** | | **Soil** | | | **Sampled: 03/27/08 10:58** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.73 | ug/kg dry | 1x | 8D09045 | 04/09/08 16:54 | 04/09/08 23:23 | |
| Bromodichloromethane | " | ND | ----- | 2.73 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.73 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.45 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.73 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.73 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.73 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.73 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.45 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.73 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.73 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.73 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.73 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.73 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.73 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.73 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.73 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.73 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.73 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.73 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.73 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.45 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.73 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **31.1** | ----- | 2.73 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.73 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.73 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.73 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.73 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.73 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *146%* | | *60 - 140 %* | " | | | " | ***Z2*** |
| *Toluene-d8* | | | *126%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *105%* | | *60 - 140 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-18 (B-13-20)** | | **Soil** | | | **Sampled: 03/27/08 11:05** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.82 | ug/kg dry | 1x | 8D09045 | 04/09/08 16:54 | 04/09/08 23:48 | |
| Bromodichloromethane | " | ND | ----- | 2.82 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.82 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.65 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.82 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.82 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.82 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.82 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.65 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.82 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.82 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.82 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.82 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.82 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.82 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.82 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.82 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.82 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.82 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.82 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.82 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.65 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.82 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **31.4** | ----- | 2.82 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.82 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.82 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.82 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.82 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.82 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *146%* | | *60 - 140 %* | " | | | " | ***Z2*** |
| *Toluene-d8* | | | *122%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *104%* | | *60 - 140 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-19 (B-13-26)** | | **Soil** | | | **Sampled: 03/27/08 11:21** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 2.77 | ug/kg dry | 1x | 8D09045 | 04/09/08 16:54 | 04/10/08 00:14 | |
| Bromodichloromethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 5.55 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 5.55 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.55 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **23.1** | ----- | 2.77 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 2.77 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 2.77 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *151%* | | *60 - 140 %* | " | | | " | ***Z2*** |
| *Toluene-d8* | | | *123%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *104%* | | *60 - 140 %* | " | | | " | |

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Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-20 (B-17)** | | **Water** | | | **Sampled: 03/26/08 10:00** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D04037 | 04/04/08 18:44 | 04/05/08 02:55 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **0.690** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **0.720** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | | *107%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | *100%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | *108%* | | *80 - 120 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-21 (B-8)** | | **Water** | | | **Sampled: 03/26/08 11:20** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D04037 | 04/04/08 18:44 | 04/05/08 03:24 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **51.4** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | | *108%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | *101%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | *103%* | | *80 - 120 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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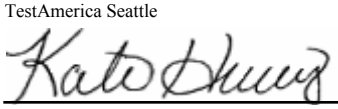
| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-22 (B-5)** | | **Water** | | | **Sampled: 03/26/08 13:25** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D04037 | 04/04/08 18:44 | 04/05/08 03:53 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **0.960** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **0.480** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | | *107%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | *100%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | *101%* | | *80 - 120 %* | " | | | " | |

TestAmerica Seattle



Kate Haney, Project Manager

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| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Physical Parameters by APHA/ASTM/EPA Methods

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-02 (B-17-10)** | | **Soil** | | | | **Sampled: 03/26/08 09:03** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **74.1** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-03 (B-17-20)** | | **Soil** | | | | **Sampled: 03/26/08 09:10** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **87.5** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-04 (B-17-30)** | | **Soil** | | | | **Sampled: 03/26/08 09:22** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **83.3** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-05 (B-8-10)** | | **Soil** | | | | **Sampled: 03/26/08 10:40** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **92.6** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-06 (B-8-20)** | | **Soil** | | | | **Sampled: 03/26/08 10:48** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **97.6** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-07 (B-8-30)** | | **Soil** | | | | **Sampled: 03/26/08 11:00** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **95.8** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-08 (B-5-10)** | | **Soil** | | | | **Sampled: 03/26/08 12:37** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **95.0** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-09 (B-5-20)** | | **Soil** | | | | **Sampled: 03/26/08 12:48** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **76.4** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-10 (B-5-30)** | | **Soil** | | | | **Sampled: 03/26/08 12:55** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **91.3** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-11 (B-11-10)** | | **Soil** | | | | **Sampled: 03/27/08 08:22** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **89.1** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-12 (B-11-20)** | | **Soil** | | | | **Sampled: 03/27/08 08:30** | | | | |

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Kate Haney, Project Manager

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Physical Parameters by APHA/ASTM/EPA Methods

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| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRC0454-12 (B-11-20)** | | **Soil** | | | | **Sampled: 03/27/08 08:30** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **76.5** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-13 (B-11-30)** | | **Soil** | | | | **Sampled: 03/27/08 08:38** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **88.2** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-14 (B-12-10)** | | **Soil** | | | | **Sampled: 03/27/08 09:55** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **89.6** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-15 (B-12-20)** | | **Soil** | | | | **Sampled: 03/27/08 10:00** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **97.5** | ----- | 1.00 | % | 1x | 8D04042 | 04/04/08 17:27 | 04/07/08 00:00 | |
| **BRC0454-16 (B-12-25)** | | **Soil** | | | | **Sampled: 03/27/08 10:10** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **85.0** | ----- | 1.00 | % | 1x | 8D04043 | 04/04/08 17:28 | 04/07/08 00:00 | |
| **BRC0454-17 (B-13-10)** | | **Soil** | | | | **Sampled: 03/27/08 10:58** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **89.8** | ----- | 1.00 | % | 1x | 8D04043 | 04/04/08 17:28 | 04/07/08 00:00 | |
| **BRC0454-18 (B-13-20)** | | **Soil** | | | | **Sampled: 03/27/08 11:05** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **80.4** | ----- | 1.00 | % | 1x | 8D04043 | 04/04/08 17:28 | 04/07/08 00:00 | |
| **BRC0454-19 (B-13-26)** | | **Soil** | | | | **Sampled: 03/27/08 11:21** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **95.2** | ----- | 1.00 | % | 1x | 8D04043 | 04/04/08 17:28 | 04/07/08 00:00 | |

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D02051** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D02051-BLK1)** | | | | | | | **Extracted: 04/02/08 21:31** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 0.250 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 04/03/08 00:50 | |
| Bromodichloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 0.250 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 105%* | | | | *Limits: 76-138%* | " | | | | | | *04/03/08 00:50* | |
| *Toluene-d8* | | *103%* | | | | *80-120%* | " | | | | | | *"* | |
| *4-BFB* | | *115%* | | | | *80-120%* | " | | | | | | *"* | |

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Kate Haney, Project Manager

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D02051** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LCS (8D02051-BS1)** | | | | | | | **Extracted: 04/02/08 22:31** | | | | | | | |
| Chlorobenzene | EPA 8260B | 37.9 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 94.8% | (80-120) | -- | -- | 04/03/08 02:46 | |
| 1,1-Dichloroethene | " | 42.1 | --- | 0.200 | " | " | -- | " | 105% | " | -- | -- | " | |
| Trichloroethene | " | 39.9 | --- | 0.200 | " | " | -- | " | 99.7% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 98.8%* | | | *Limits: 76-138%* | " | | | | | | | *04/03/08 02:46* | |
| *Toluene-d8* | | *96.2%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *90.3%* | | | *80-120%* | " | | | | | | | " | |
| **LCS Dup (8D02051-BSD1)** | | | | | | | **Extracted: 04/02/08 22:31** | | | | | | | |
| Chlorobenzene | EPA 8260B | 37.8 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 94.5% | (80-120) | 0.291% | (20) | 04/03/08 03:15 | |
| 1,1-Dichloroethene | " | 40.1 | --- | 0.200 | " | " | -- | " | 100% | " | 4.89% | " | " | |
| Trichloroethene | " | 39.7 | --- | 0.200 | " | " | -- | " | 99.2% | " | 0.503% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 99.8%* | | | *Limits: 76-138%* | " | | | | | | | *04/03/08 03:15* | |
| *Toluene-d8* | | *96.9%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *91.4%* | | | *80-120%* | " | | | | | | | " | |

**QC Batch: 8D04037** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D04037-BLK1)** | | | | | | | **Extracted: 04/04/08 15:44** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 0.250 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 04/04/08 21:26 | |
| Bromodichloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 0.250 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |

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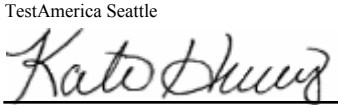

Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D04037** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D04037-BLK1)** | | | | | | | | **Extracted: 04/04/08 15:44** | | | | | | |
| cis-1,3-Dichloropropene | EPA 8260B | ND | --- | 0.200 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 04/04/08 21:26 | |
| trans-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 96.7%* | | | *Limits: 76-138%* | " | | | | | | | *04/04/08 21:26* | |
| *Toluene-d8* | | *101%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *111%* | | | *80-120%* | " | | | | | | | " | |
| **LCS (8D04037-BS1)** | | | | | | | | **Extracted: 04/04/08 15:44** | | | | | | |
| Chlorobenzene | EPA 8260B | 39.5 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 98.8% | (80-120) | -- | -- | 04/04/08 18:02 | |
| 1,1-Dichloroethene | " | 42.1 | --- | 0.200 | " | " | -- | " | 105% | " | -- | -- | " | |
| Trichloroethene | " | 41.3 | --- | 0.200 | " | " | -- | " | 103% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 94.2%* | | | *Limits: 76-138%* | " | | | | | | | *04/04/08 18:02* | |
| *Toluene-d8* | | *95.6%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *94.0%* | | | *80-120%* | " | | | | | | | " | |
| **LCS Dup (8D04037-BSD1)** | | | | | | | | **Extracted: 04/04/08 15:44** | | | | | | |
| Chlorobenzene | EPA 8260B | 38.0 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 95.1% | (80-120) | 3.79% | (20) | 04/04/08 18:32 | |
| 1,1-Dichloroethene | " | 39.6 | --- | 0.200 | " | " | -- | " | 99.1% | " | 5.99% | " | " | |
| Trichloroethene | " | 39.7 | --- | 0.200 | " | " | -- | " | 99.2% | " | 3.95% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 95.2%* | | | *Limits: 76-138%* | " | | | | | | | *04/04/08 18:32* | |
| *Toluene-d8* | | *95.8%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *94.0%* | | | *80-120%* | " | | | | | | | " | |
| **Matrix Spike (8D04037-MS1)** | | | | | | | **QC Source: BRC0387-02** | **Extracted: 04/04/08 15:44** | | | | | | |
| Chlorobenzene | EPA 8260B | 16.7 | --- | 0.200 | ug/l | 1x | 0.110 | 20.0 | 82.9% | (75-125) | -- | -- | 04/04/08 23:32 | |
| 1,1-Dichloroethene | " | 24.0 | --- | 0.200 | " | " | ND | " | 120% | (61-120) | -- | -- | " | |
| Trichloroethene | " | 19.5 | --- | 0.200 | " | " | 0.110 | " | 96.8% | (75-125) | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 105%* | | | *Limits: 76-138%* | " | | | | | | | *04/04/08 23:32* | |
| *Toluene-d8* | | *96.1%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *92.8%* | | | *80-120%* | " | | | | | | | " | |

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| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D04037** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Matrix Spike Dup (8D04037-MSD1)** | | | | **QC Source: BRC0387-02** | | | | | **Extracted: 04/04/08 15:44** | | | | | |
| Chlorobenzene | EPA 8260B | 18.8 | --- | 0.200 | ug/l | 1x | 0.110 | 20.0 | 93.2% | (75-125) | 11.6% | (20) | 04/05/08 00:01 | |
| 1,1-Dichloroethene | " | 27.2 | --- | 0.200 | " | " | ND | " | 136% | (61-120) | 12.7% | (30) | " | M7 |
| Trichloroethene | " | 21.9 | --- | 0.200 | " | " | 0.110 | " | 109% | (75-125) | 11.9% | (20) | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 106%* | | *Limits: 76-138%* | " | | | | | | | | *04/05/08 00:01* | |
| *Toluene-d8* | | *95.3%* | | *80-120%* | " | | | | | | | | " | |
| *4-BFB* | | *93.4%* | | *80-120%* | " | | | | | | | | " | |

**QC Batch: 8D08035** **Soil Preparation Method: EPA 5035**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D08035-BLK1)** | | | | | | | | | | **Extracted: 04/08/08 13:16** | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 5.00 | ug/kg wet | 1x | -- | -- | -- | -- | -- | -- | 04/08/08 15:02 | |
| Bromodichloromethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 10.0 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 10.0 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 10.0 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method) - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D08035** **Soil Preparation Method: EPA 5035**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D08035-BLK1)** | | | | | | | | | **Extracted: 04/08/08 13:16** | | | | | |
| Trichlorofluoromethane | EPA 8260B | ND | --- | 5.00 | ug/kg wet | 1x | -- | -- | -- | -- | -- | -- | 04/08/08 15:02 | |
| Vinyl chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 122%* | | | *Limits: 60-140%* | " | | | | | | | *04/08/08 15:02* | |
| *Toluene-d8* | | *94.6%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *99.6%* | | | *60-140%* | " | | | | | | | " | |
| **LCS (8D08035-BS1)** | | | | | | | | | **Extracted: 04/08/08 13:16** | | | | | |
| Bromochloromethane | EPA 8260B | 54.5 | --- | 5.00 | ug/kg wet | 1x | -- | 50.0 | 109% | (75-125) | -- | -- | 04/08/08 13:38 | |
| Chlorobenzene | " | 47.5 | --- | 5.00 | " | " | -- | " | 94.9% | (70-130) | -- | -- | " | |
| 1,1-Dichloroethene | " | 54.7 | --- | 5.00 | " | " | -- | " | 109% | " | -- | -- | " | |
| Trichloroethene | " | 49.2 | --- | 5.00 | " | " | -- | " | 98.5% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 102%* | | | *Limits: 60-140%* | " | | | | | | | *04/08/08 13:38* | |
| *Toluene-d8* | | *101%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *99.6%* | | | *60-140%* | " | | | | | | | " | |
| **LCS Dup (8D08035-BSD1)** | | | | | | | | | **Extracted: 04/08/08 13:16** | | | | | |
| Bromochloromethane | EPA 8260B | 61.2 | --- | 5.00 | ug/kg wet | 1x | -- | 50.0 | 122% | (75-125) | 11.6% | (30) | 04/08/08 14:35 | |
| Chlorobenzene | " | 48.8 | --- | 5.00 | " | " | -- | " | 97.6% | (70-130) | 2.78% | " | " | |
| 1,1-Dichloroethene | " | 56.3 | --- | 5.00 | " | " | -- | " | 113% | " | 2.87% | " | " | |
| Trichloroethene | " | 53.0 | --- | 5.00 | " | " | -- | " | 106% | " | 7.41% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 102%* | | | *Limits: 60-140%* | " | | | | | | | *04/08/08 14:35* | |
| *Toluene-d8* | | *96.7%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *99.7%* | | | *60-140%* | " | | | | | | | " | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method) - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D09045** **Soil Preparation Method: EPA 5035**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D09045-BLK1)** | | | | | | | **Extracted: 04/09/08 16:54** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 5.00 | ug/kg wet | 1x | -- | -- | -- | -- | -- | -- | 04/09/08 19:10 | |
| Bromodichloromethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 10.0 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 10.0 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | 13.9 | --- | 10.0 | " | " | -- | -- | -- | -- | -- | -- | " | B |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 111%* | | | *Limits: 60-140%* | " | | | | | | | *04/09/08 19:10* | |
| *Toluene-d8* | | *90.3%* | | | *60-140%* | " | | | | | | | *"* | |
| *4-BFB* | | *100%* | | | *60-140%* | " | | | | | | | *"* | |

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method) - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D09045** **Soil Preparation Method: EPA 5035**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LCS (8D09045-BS1)** | | | | | | | **Extracted: 04/09/08 16:54** | | | | | | | |
| Bromochloromethane | EPA 8260B | 58.5 | --- | 5.00 | ug/kg wet | 1x | -- | 50.0 | 117% | (75-125) | -- | -- | 04/09/08 18:20 | |
| Chlorobenzene | " | 44.4 | --- | 5.00 | " | " | -- | " | 88.8% | (70-130) | -- | -- | " | |
| 1,1-Dichloroethene | " | 54.4 | --- | 5.00 | " | " | -- | " | 109% | " | -- | -- | " | |
| Trichloroethene | " | 48.8 | --- | 5.00 | " | " | -- | " | 97.6% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 102%* | | | *Limits: 60-140%* | " | | | | | | | *04/09/08 18:20* | |
| *Toluene-d8* | | *95.2%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *98.2%* | | | *60-140%* | " | | | | | | | " | |
| **LCS Dup (8D09045-BSD1)** | | | | | | | **Extracted: 04/09/08 16:54** | | | | | | | |
| Bromochloromethane | EPA 8260B | 56.1 | --- | 5.00 | ug/kg wet | 1x | -- | 50.0 | 112% | (75-125) | 4.15% | (30) | 04/09/08 18:45 | |
| Chlorobenzene | " | 45.0 | --- | 5.00 | " | " | -- | " | 90.0% | (70-130) | 1.32% | " | " | |
| 1,1-Dichloroethene | " | 55.3 | --- | 5.00 | " | " | -- | " | 111% | " | 1.64% | " | " | |
| Trichloroethene | " | 50.2 | --- | 5.00 | " | " | -- | " | 100% | " | 2.85% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 97.8%* | | | *Limits: 60-140%* | " | | | | | | | *04/09/08 18:45* | |
| *Toluene-d8* | | *94.1%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *98.8%* | | | *60-140%* | " | | | | | | | " | |

**QC Batch: 8D09052** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D09052-BLK1)** | | | | | | | **Extracted: 04/09/08 18:32** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 100 | ug/kg wet | 1x | -- | -- | -- | -- | -- | -- | 04/10/08 09:50 | |
| Bromodichloromethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

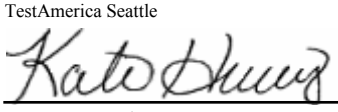
## Volatile Organic Compounds (Special List) by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D09052** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D09052-BLK1)** | | | | | | | | | **Extracted: 04/09/08 18:32** | | | | | |
| trans-1,2-Dichloroethene | EPA 8260B | ND | --- | 100 | ug/kg wet | 1x | -- | -- | -- | -- | -- | -- | 04/10/08 09:50 | |
| 1,2-Dichloropropane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 1000 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 101%* | | | *Limits: 75-125%* | " | | | | | | | *04/10/08 09:50* | |
| *Toluene-d8* | | *100%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *99.5%* | | | *75-125%* | " | | | | | | | " | |
| **LCS (8D09052-BS1)** | | | | | | | | | **Extracted: 04/09/08 18:32** | | | | | |
| Chlorobenzene | EPA 8260B | 3840 | --- | 100 | ug/kg wet | 1x | -- | 4000 | 96.1% | (75-125) | -- | -- | 04/10/08 08:36 | |
| 1,1-Dichloroethene | " | 4130 | --- | 100 | " | " | -- | " | 103% | (69-128) | -- | -- | " | |
| Trichloroethene | " | 3890 | --- | 100 | " | " | -- | " | 97.2% | (75-125) | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 96.8%* | | | *Limits: 75-125%* | " | | | | | | | *04/10/08 08:36* | |
| *Toluene-d8* | | *99.2%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *99.2%* | | | *75-125%* | " | | | | | | | " | |
| **LCS Dup (8D09052-BSD1)** | | | | | | | | | **Extracted: 04/09/08 18:32** | | | | | |
| Chlorobenzene | EPA 8260B | 4280 | --- | 100 | ug/kg wet | 1x | -- | 4000 | 107% | (75-125) | 10.7% | (20) | 04/10/08 09:13 | |
| 1,1-Dichloroethene | " | 4700 | --- | 100 | " | " | -- | " | 117% | (69-128) | 12.9% | " | " | |
| Trichloroethene | " | 4310 | --- | 100 | " | " | -- | " | 108% | (75-125) | 10.2% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 92.6%* | | | *Limits: 75-125%* | " | | | | | | | *04/10/08 09:13* | |
| *Toluene-d8* | | *100%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *99.4%* | | | *75-125%* | " | | | | | | | " | |

TestAmerica Seattle



Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D10049** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D10049-BLK1)** | | | | | | | **Extracted: 04/10/08 15:00** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 100 | ug/kg wet | 1x | -- | -- | -- | -- | -- | -- | 04/10/08 17:37 | |
| Bromodichloromethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | C5 |
| Carbon tetrachloride | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 1000 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 97.3%* | | | *Limits: 75-125%* | " | | | | | | | *04/10/08 17:37* | |
| *Toluene-d8* | | *98.0%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *98.2%* | | | *75-125%* | " | | | | | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D10049** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LCS (8D10049-BS1)** | | | | | | | **Extracted: 04/10/08 15:00** | | | | | | | |
| Chlorobenzene | EPA 8260B | 3620 | --- | 100 | ug/kg wet | 1x | -- | 4000 | 90.5% | (75-125) | -- | -- | 04/10/08 16:02 | |
| 1,1-Dichloroethene | " | 3640 | --- | 100 | " | " | -- | " | 91.1% | (69-128) | -- | -- | " | |
| Trichloroethene | " | 3240 | --- | 100 | " | " | -- | " | 80.9% | (75-125) | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 86.4%* | | | *Limits: 75-125%* | " | | | | | | | *04/10/08 16:02* | |
| *Toluene-d8* | | *97.6%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *96.2%* | | | *75-125%* | " | | | | | | | " | |
| **LCS Dup (8D10049-BSD1)** | | | | | | | **Extracted: 04/10/08 15:00** | | | | | | | |
| Chlorobenzene | EPA 8260B | 3820 | --- | 100 | ug/kg wet | 1x | -- | 4000 | 95.6% | (75-125) | 5.51% | (20) | 04/10/08 16:29 | |
| 1,1-Dichloroethene | " | 3880 | --- | 100 | " | " | -- | " | 97.0% | (69-128) | 6.33% | " | " | |
| Trichloroethene | " | 3440 | --- | 100 | " | " | -- | " | 86.0% | (75-125) | 6.17% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 99.7%* | | | *Limits: 75-125%* | " | | | | | | | *04/10/08 16:29* | |
| *Toluene-d8* | | *96.4%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *96.4%* | | | *75-125%* | " | | | | | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Physical Parameters by APHA/ASTM/EPA Methods - Laboratory Quality Control Results

TestAmerica Seattle

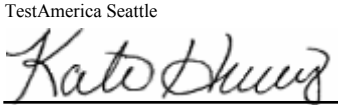
**QC Batch: 8D04042** **Soil Preparation Method: Dry Weight**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D04042-BLK1)** | | | | | | | | | | | | | **Extracted: 04/04/08 17:27** | |
| Dry Weight | BSOPSPL00 3R08 | 99.9 | --- | 1.00 | % | 1x | -- | -- | -- | -- | -- | -- | 04/07/08 00:00 | |

**QC Batch: 8D04043** **Soil Preparation Method: Dry Weight**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D04043-BLK1)** | | | | | | | | | | | | | **Extracted: 04/04/08 17:28** | |
| Dry Weight | BSOPSPL00 3R08 | 100 | --- | 1.00 | % | 1x | -- | -- | -- | -- | -- | -- | 04/07/08 00:00 | |

TestAmerica Seattle



Kate Haney, Project Manager

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PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Olivia Williams | 04/15/08 14:33 |

## Notes and Definitions

Report Specific Notes:

| | | |
|---|---|---|
| B | - | Analyte was detected in the associated Method Blank. |
| C5 | - | Calibration Verification recovery was below the method control limit for this analyte. An additional check standard was analyzed at the reporting limit to ensure instrument sensitivity at the reporting limit. Samples ND. |
| I2 | - | Internal Standard recovery was outside of method limits. |
| M7 | - | The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS). |
| Z2 | - | Surrogate recovery was above the acceptance limits. Data not impacted. |
| ZX | - | Due to sample matrix effects, the surrogate recovery was outside the acceptance limits. |

Laboratory Reporting Conventions:

| | | |
|---|---|---|
| DET | - | Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only. |
| ND | - | Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate). |
| NR/NA | - | Not Reported / Not Available |
| dry | - | Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight. |
| wet | - | Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis. |
| RPD | - | RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries). |
| MRL | - | METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table. |
| MDL* | - | METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results. |
| Dil | - | Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data. |
| Reporting Limits | - | Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable. |
| Electronic Signature | - | Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature. |

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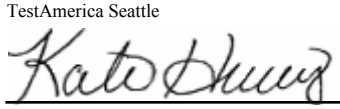

Kate Haney, Project Manager

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9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


# CHAIN OF CUSTODY REPORT

**Work Order #:** BRC0454

CLIENT:

INVOICE TO:

REPORT TO: ERM
ADDRESS: 915 118th Ave SE Bellevue WA 98005
PHONE: (425) 462-8591 FAX: (425) 455-3573

P.O. NUMBER:

PROJECT NAME: Normandy Park
PROJECT NUMBER: 75720
SAMPLED BY: Kevin Kroseh

**TURNAROUND REQUEST**
in Business Days *
Organic & Inorganic Analyses: ~~10~~ STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE

REQUESTED ANALYSES: CVOC 8260B

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|
| 1 | B-16 | 3/24/08 0810 | W | 3 | | 01 |
| 2 | B-17-10 | " " 0903 | S | 4 | | 02 |
| 3 | B-17-20 | " " 0910 | S | 4 | | 03 |
| 4 | B-17-30 | " " 0922 | S | 4 | | 04 |
| 5 | B-8-10 | " " 1040 | S | 4 | | 05 |
| 6 | B-8-20 | " " 1048 | S | 4 | | 06 |
| 7 | B-8-30 | " " 1100 | S | 4 | | 07 |
| 8 | B-5-10 | " " 1237 | S | 4 | | 08 |
| 9 | B-5-20 | " " 1248 | S | 4 | | 09 |
| 10 | B-5-30 | " " 1255 | S | 4 | | 10 |

RELEASED BY: for Kevin Kroseh — DATE: 3/27/08
PRINT NAME: FIRM: ERM — TIME: 1500

RECEIVED BY: Kate Haney — DATE: 3/27/08
PRINT NAME: FIRM: TA — TIME: 1500

RELEASED BY: — DATE:
PRINT NAME: FIRM: — TIME:

RECEIVED BY: — DATE:
PRINT NAME: FIRM: — TIME:

ADDITIONAL REMARKS:

TEMP:

PAGE 1 OF 3

TAL-1000(0108)

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11922 E. First Ave, Spokane, WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


# CHAIN OF CUSTODY REPORT

**Work Order #:** BRC0454

CLIENT:

INVOICE TO:

REPORT TO: ERM

ADDRESS: 915 118th Ave SE Suite 130 Bellevue, WA 98005

PHONE: (425) 462-8591 FAX: (425) 455-3573

P.O. NUMBER:

PROJECT NAME: Normandy Park

PROJECT NUMBER: 75720

SAMPLED BY: Kevin Kneschke

**TURNAROUND REQUEST**

in Business Days *

Organic & Inorganic Analyses: ~~10~~ STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* *Turnaround Requests less than standard may incur Rush Charges.*

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | PRESERVATIVE: CVOC 8260B | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|---|
| 1 | B-11-10 | 3/27/08 0822 | — | S | 4 | | 11 |
| 2 | B-11-20 | " " 0830 | — | S | 4 | | 12 |
| 3 | B-11-30 | " " 0838 | — | S | 4 | | 13 |
| 4 | B-12-10 | " " 0955 | — | S | 4 | | 14 |
| 5 | B-12-20 | " " 1000 | — | S | 4 | | 15 |
| 6 | B-12-25 | " " 1010 | — | S | 4 | | 16 |
| 7 | B-13-10 | " " 1058 | — | S | 4 | | 17 |
| 8 | B-13-20 | " " 1105 | — | S | 3 | | 18 |
| 9 | B-13-26 | " " 1121 | — | S | 4 | | 19 |
| 10 | | | | | | | |

RELEASED BY: Kevin Kneschke — DATE: 3/27/08 TIME: 1500

PRINT NAME: Kevin Kneschke — FIRM: ERM

RECEIVED BY: Kate Hurley — DATE: 3/27/08

PRINT NAME: — FIRM: TA — TIME: 1500

RELEASED BY: — DATE:

PRINT NAME: — FIRM: — TIME:

RECEIVED BY: — DATE:

PRINT NAME: — FIRM: — TIME:

ADDITIONAL REMARKS:

TEMP:



TAL-1000(0108)

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11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244 425-420-9200 FAX 420-9210
11922 E. First Ave, Spokane, WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


# CHAIN OF CUSTODY REPORT

**Work Order #:** BRC0454

CLIENT:

INVOICE TO:

REPORT TO: ERM
ADDRESS: 915 118th Ave SE Suite 130 Bellevue WA 98005
PHONE: (425)462-8591 FAX: (425)455-3573

P.O. NUMBER:

PROJECT NAME: Normandy Park
PROJECT NUMBER: 75720
SAMPLED BY: Kevin Kreech

**TURNAROUND REQUEST**
in Business Days *
Organic & Inorganic Analyses: [10] STD. [7] [5] [4] [3] [2] [1] [<1]
Petroleum Hydrocarbon Analyses: [5] STD. [4] [3] [2] [1] [<1]
[OTHER] Specify:
* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE

REQUESTED ANALYSES: CVOC 8260B

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|
| 1 | B-17 | 3/26/08 1000 | W | 3 | | 20 |
| 2 | B-8 | 3/26/08 1120 | W | 3 | | 21 |
| 3 | B-5 | 3/26/08 1325 | W | 3 | | 22 |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |

RELEASED BY: PRINT NAME: FIRM: DATE: TIME:
RECEIVED BY: Kate Haney PRINT NAME: FIRM: TA DATE: 3/27/08 TIME: 1500

RELEASED BY: PRINT NAME: Kevin Kreech FIRM: ERM DATE: 3/27/08 TIME: 1500
RECEIVED BY: PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS:

TEMP:



TAL-1000(0108)

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PH: (425) 420.9200 FAX: (425) 420.9210

April 25, 2008

Kevin Knesek
ERM-Bellevue
915-118th Avenue S.E., Suite 130
Bellevue, WA 98005

RE: Normandy Park

Enclosed are the results of analyses for samples received by the laboratory on 04/15/08 14:20. The following list is a summary of the Work Orders contained in this report, generated on 04/25/08 12:03.

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

| Work Order | Project | ProjectNumber |
|---|---|---|
| BRD0213 | Normandy Park | 75720 |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| MW-5 | BRD0213-01 | Water | 04/11/08 15:54 | 04/15/08 14:20 |
| MW-5 | BRD0213-02 | Water | 04/11/08 15:15 | 04/15/08 14:20 |
| MW-5 | BRD0213-03 | Water | 04/11/08 15:52 | 04/15/08 14:20 |
| MW-3 | BRD0213-04 | Water | 04/14/08 09:41 | 04/15/08 14:20 |
| MW-4 | BRD0213-05 | Water | 04/14/08 08:46 | 04/15/08 14:20 |
| DC-4 | BRD0213-06 | Water | 04/14/08 10:20 | 04/15/08 14:20 |
| DC-4 | BRD0213-07 | Water | 04/11/08 10:20 | 04/15/08 14:20 |
| DC-3 | BRD0213-08 | Water | 04/14/08 10:50 | 04/15/08 14:20 |
| DC-3 | BRD0213-09 | Water | 04/11/08 10:50 | 04/15/08 14:20 |
| DC-2 | BRD0213-10 | Water | 04/14/08 11:36 | 04/15/08 14:20 |
| DC-2 | BRD0213-11 | Water | 04/14/08 11:36 | 04/15/08 14:20 |
| DC-19 | BRD0213-12 | Water | 04/14/08 12:33 | 04/15/08 14:20 |
| KMW-1 | BRD0213-13 | Water | 04/14/08 13:20 | 04/15/08 14:20 |

TestAmerica Seattle

Kate Haney, Project Manager

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

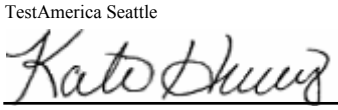
| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Hydrocarbon Identification by Washington DOE Method NWTPH-HCID

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0213-01 (MW-5)** | | **Water** | | | | | **Sampled: 04/11/08 15:54** | | | |
| Gx Range Hydrocarbons | NWTPH-HCID | ND | ----- | 0.236 | mg/l | 1x | 8D17016 | 04/17/08 09:18 | 04/21/08 16:45 | |
| Kerosene Range Hydrocarbons | " | ND | ----- | 0.594 | " | " | " | " | " | |
| Diesel Range Hydrocarbons | " | ND | ----- | 0.594 | " | " | " | " | " | |
| Insulating Oil Range Hydrocarbons | " | ND | ----- | 0.594 | " | " | " | " | " | |
| Heavy Fuel Oil Range Hydrocarbons | " | ND | ----- | 0.594 | " | " | " | " | " | |
| Lube Oil Range Hydrocarbons | " | ND | ----- | 0.594 | " | " | " | " | " | |
| *Surrogate(s): 2-FBP* | | | *81.7%* | | *50 - 150 %* | " | | | " | |
| *Octacosane* | | | *121%* | | *50 - 150 %* | " | | | " | |

TestAmerica Seattle



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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Total Metals by EPA 6000/7000 Series Methods

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0213-03 (MW-5)** | | **Water** | | | | **Sampled: 04/11/08 15:52** | | | | |
| Arsenic | EPA 6020 | ND | ----- | 0.00100 | mg/l | 1x | 8D16049 | 04/16/08 16:46 | 04/18/08 09:37 | |
| Chromium | " | ND | ----- | 0.00100 | " | " | " | " | " | |
| Iron | EPA 6010B | ND | ----- | 0.150 | " | " | 8D16050 | 04/16/08 16:48 | 04/17/08 16:24 | |
| **Manganese** | EPA 6020 | **0.165** | ----- | 0.0100 | " | " | 8D16049 | 04/16/08 16:46 | 04/18/08 09:37 | |
| **BRD0213-07 (DC-4)** | | **Water** | | | | **Sampled: 04/11/08 10:20** | | | | |
| Arsenic | EPA 6020 | ND | ----- | 0.00100 | mg/l | 1x | 8D16049 | 04/16/08 16:46 | 04/18/08 09:43 | |
| **Chromium** | " | **0.00103** | ----- | 0.00100 | " | " | " | " | " | |
| Iron | EPA 6010B | ND | ----- | 0.150 | " | " | 8D16050 | 04/16/08 16:48 | 04/17/08 16:28 | |
| Manganese | EPA 6020 | ND | ----- | 0.0100 | " | " | 8D16049 | 04/16/08 16:46 | 04/18/08 09:43 | |
| **BRD0213-09 (DC-3)** | | **Water** | | | | **Sampled: 04/11/08 10:50** | | | | |
| Arsenic | EPA 6020 | ND | ----- | 0.00100 | mg/l | 1x | 8D16049 | 04/16/08 16:46 | 04/18/08 09:49 | |
| Chromium | " | ND | ----- | 0.00100 | " | " | " | " | " | |
| **Iron** | EPA 6010B | **0.292** | ----- | 0.150 | " | " | 8D16050 | 04/16/08 16:48 | 04/17/08 16:31 | |
| **Manganese** | EPA 6020 | **0.0243** | ----- | 0.0100 | " | " | 8D16049 | 04/16/08 16:46 | 04/18/08 09:49 | |
| **BRD0213-11 (DC-2)** | | **Water** | | | | **Sampled: 04/14/08 11:36** | | | | |
| Arsenic | EPA 6020 | ND | ----- | 0.00100 | mg/l | 1x | 8D16049 | 04/16/08 16:46 | 04/18/08 11:01 | |
| Chromium | " | ND | ----- | 0.00100 | " | " | " | " | " | |
| Iron | EPA 6010B | ND | ----- | 0.150 | " | " | 8D16050 | 04/16/08 16:48 | 04/17/08 16:35 | |
| Manganese | EPA 6020 | ND | ----- | 0.0100 | " | " | 8D16049 | 04/16/08 16:46 | 04/18/08 11:01 | |

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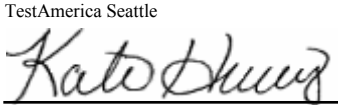

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Volatile Organic Compounds by EPA Method 8260B

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| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0213-02 (MW-5)** | | **Water** | | | **Sampled: 04/11/08 15:15** | | | | | |
| Acetone | EPA 8260B | ND | ----- | 10.0 | ug/l | 1x | 8D21053 | 04/21/08 23:36 | 04/22/08 10:49 | |
| Benzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromobenzene | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Bromochloromethane | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| 2-Butanone | " | ND | ----- | 2.00 | " | " | " | " | " | |
| n-Butylbenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| sec-Butylbenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| tert-Butylbenzene | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Carbon disulfide | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| 2-Chlorotoluene | " | ND | ----- | 0.500 | " | " | " | " | " | |
| 4-Chlorotoluene | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dibromo-3-chloropropane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| 1,2-Dibromoethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Dibromomethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Dichlorodifluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 2,2-Dichloropropane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| 1,1-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Ethylbenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Hexachlorobutadiene | " | ND | ----- | 2.50 | " | " | " | " | " | |
| Methyl tert-butyl ether | " | ND | ----- | 1.00 | " | " | " | " | " | |
| n-Hexane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| 2-Hexanone | " | ND | ----- | 2.00 | " | " | " | " | " | |

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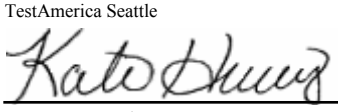

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|---|---|---|---|
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| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0213-02 (MW-5)** | | **Water** | | | **Sampled: 04/11/08 15:15** | | | | | |
| Isopropylbenzene | EPA 8260B | ND | ----- | 0.500 | ug/l | 1x | 8D21053 | 04/21/08 23:36 | 04/22/08 10:49 | |
| p-Isopropyltoluene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 4-Methyl-2-pentanone | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| Naphthalene | " | ND | ----- | 2.50 | " | " | " | " | " | |
| n-Propylbenzene | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Styrene | " | ND | ----- | 0.500 | " | " | " | " | " | |
| 1,2,3-Trichlorobenzene | " | ND | ----- | 1.00 | " | " | " | " | " | |
| 1,2,4-Trichlorobenzene | " | ND | ----- | 1.00 | " | " | " | " | " | |
| 1,1,1,2-Tetrachloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **0.470** | ----- | 0.200 | " | " | " | " | " | |
| Toluene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| 1,2,3-Trichloropropane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| o-Xylene | " | ND | ----- | 0.250 | " | " | " | " | " | |
| m,p-Xylene | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Total Xylenes | " | ND | ----- | 0.750 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *103%* | | *76 - 138 %* | " | | | " | |
| *Toluene-d8* | | | *95.0%* | | *80 - 120 %* | " | | | " | |
| *4-BFB* | | | *95.4%* | | *80 - 120 %* | " | | | " | |
| **BRD0213-04 (MW-3)** | | **Water** | | | **Sampled: 04/14/08 09:41** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D23010 | 04/23/08 12:31 | 04/23/08 18:33 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **0.990** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |

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| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0213-04 (MW-3)** | | **Water** | | | **Sampled: 04/14/08 09:41** | | | | | |
| 1,1-Dichloroethane | EPA 8260B | ND | ----- | 0.200 | ug/l | 1x | 8D23010 | 04/23/08 12:31 | 04/23/08 18:33 | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **2.31** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *102%* | | | *76 - 138 %* | " | | | " | |
| *Toluene-d8* | | *102%* | | | *80 - 120 %* | " | | | " | |
| *4-BFB* | | *99.8%* | | | *80 - 120 %* | " | | | " | |
| **BRD0213-05 (MW-4)** | | **Water** | | | **Sampled: 04/14/08 08:46** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D23010 | 04/23/08 12:31 | 04/23/08 19:00 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **0.780** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| **cis-1,2-Dichloroethene** | " | **0.320** | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |

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## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0213-05 (MW-4)** | | **Water** | | | **Sampled: 04/14/08 08:46** | | | | | |
| Methylene chloride | EPA 8260B | ND | ----- | 5.00 | ug/l | 1x | 8D23010 | 04/23/08 12:31 | 04/23/08 19:00 | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **32.6** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| **Trichloroethene** | " | **0.490** | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *101%* | | *76 - 138 %* | " | | | " | |
| *Toluene-d8* | | | *100%* | | *80 - 120 %* | " | | | " | |
| *4-BFB* | | | *96.2%* | | *80 - 120 %* | " | | | " | |
| **BRD0213-06 (DC-4)** | | **Water** | | | **Sampled: 04/14/08 10:20** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D23010 | 04/23/08 12:31 | 04/23/08 19:27 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **1.20** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **30.2** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0213-06 (DC-4)** | | **Water** | | | **Sampled: 04/14/08 10:20** | | | | | |
| *Surrogate(s): 1,2-DCA-d4* | | *101%* | | *76 - 138 %* | *1x* | | | | *04/23/08 19:27* | |
| *Toluene-d8* | | *99.7%* | | *80 - 120 %* | *"* | | | | *"* | |
| *4-BFB* | | *98.1%* | | *80 - 120 %* | *"* | | | | *"* | |
| **BRD0213-08 (DC-3)** | | **Water** | | | **Sampled: 04/14/08 10:50** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D23010 | 04/23/08 12:31 | 04/23/08 19:54 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **1.50** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **27.8** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *99.3%* | | *76 - 138 %* | *"* | | | | *"* | |
| *Toluene-d8* | | *102%* | | *80 - 120 %* | *"* | | | | *"* | |
| *4-BFB* | | *98.5%* | | *80 - 120 %* | *"* | | | | *"* | |

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Kate Haney, Project Manager

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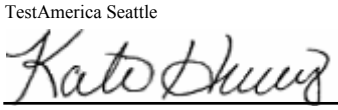
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0213-10 (DC-2)** | | **Water** | | | **Sampled: 04/14/08 11:36** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D23010 | 04/23/08 12:31 | 04/23/08 20:21 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **1.60** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **0.340** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | *101%* | | *76 - 138 %* | " | | | | " | |
| | *Toluene-d8* | *98.8%* | | *80 - 120 %* | " | | | | " | |
| | *4-BFB* | *95.0%* | | *80 - 120 %* | " | | | | " | |

TestAmerica Seattle



Kate Haney, Project Manager

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0213-12 (DC-19)** | | **Water** | | | **Sampled: 04/14/08 12:33** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D23010 | 04/23/08 12:31 | 04/23/08 20:48 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **0.660** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | | *98.4%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | *99.4%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | *98.2%* | | *80 - 120 %* | " | | | " | |

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Kate Haney, Project Manager

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0213-13 (KMW-1)** | | **Water** | | | **Sampled: 04/14/08 13:20** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D23010 | 04/23/08 12:31 | 04/23/08 21:15 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **0.450** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | | *101%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | *100%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | *99.4%* | | *80 - 120 %* | " | | | " | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Hydrocarbon Identification by Washington DOE Method NWTPH-HCID - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D17016** **Water Preparation Method: EPA 3520C**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D17016-BLK2)** | | | | | | | | **Extracted: 04/17/08 09:18** | | | | | | |
| Gx Range Hydrocarbons | NWTPH-HCID | ND | --- | 0.250 | mg/l | 1x | -- | -- | -- | -- | -- | -- | 04/21/08 15:26 | |
| Kerosene Range Hydrocarbons | " | ND | --- | 0.630 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Diesel Range Hydrocarbons | " | ND | --- | 0.630 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Insulating Oil Range Hydrocarbons | " | ND | --- | 0.630 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Heavy Fuel Oil Range Hydrocarbons | " | ND | --- | 0.630 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Lube Oil Range Hydrocarbons | " | ND | --- | 0.630 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 2-FBP* | | *Recovery: 81.9%* | | | *Limits: 50-150%* | " | | | | | | | *04/21/08 15:26* | |
| *Octacosane* | | *121%* | | | *50-150%* | " | | | | | | | " | |
| **LCS (8D17016-BS2)** | | | | | | | | **Extracted: 04/17/08 09:18** | | | | | | |
| Diesel Range Hydrocarbons | NWTPH-HCID | DET | --- | 0.630 | mg/l | 1x | -- | 2.00 | 94.8% | (58-125) | -- | -- | 04/21/08 15:53 | |
| Lube Oil Range Hydrocarbons | " | DET | --- | 0.630 | " | " | -- | " | 97.7% | (60-140) | -- | -- | " | |
| *Surrogate(s): 2-FBP* | | *Recovery: 79.5%* | | | *Limits: 50-150%* | " | | | | | | | *04/21/08 15:53* | |
| *Octacosane* | | *125%* | | | *50-150%* | " | | | | | | | " | |
| **LCS Dup (8D17016-BSD2)** | | | | | | | | **Extracted: 04/17/08 09:18** | | | | | | |
| Diesel Range Hydrocarbons | NWTPH-HCID | DET | --- | 0.630 | mg/l | 1x | -- | 2.00 | 97.6% | (58-125) | 2.96% | (40) | 04/21/08 16:19 | |
| Lube Oil Range Hydrocarbons | " | DET | --- | 0.630 | " | " | -- | " | 96.8% | (60-140) | 0.969% | " | " | |
| *Surrogate(s): 2-FBP* | | *Recovery: 87.7%* | | | *Limits: 50-150%* | " | | | | | | | *04/21/08 16:19* | |
| *Octacosane* | | *125%* | | | *50-150%* | " | | | | | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Total Metals by EPA 6000/7000 Series Methods - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D16049** **Water Preparation Method: EPA 3020A**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D16049-BLK1)** | | | | | | | | | **Extracted: 04/16/08 16:46** | | | | | |
| Chromium | EPA 6020 | ND | --- | 0.00100 | mg/l | 1x | -- | -- | -- | -- | -- | -- | 04/18/08 09:01 | |
| Manganese | " | ND | --- | 0.0100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Arsenic | " | ND | --- | 0.00100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| **LCS (8D16049-BS1)** | | | | | | | | | **Extracted: 04/16/08 16:46** | | | | | |
| Arsenic | EPA 6020 | 0.0748 | --- | 0.00100 | mg/l | 1x | -- | 0.0800 | 93.5% | (80-120) | -- | -- | 04/18/08 09:07 | |
| Manganese | " | 0.0751 | --- | 0.0100 | " | " | -- | " | 93.8% | " | -- | -- | " | |
| Chromium | " | 0.0761 | --- | 0.00100 | " | " | -- | " | 95.2% | " | -- | -- | " | |
| **Duplicate (8D16049-DUP1)** | | | | | **QC Source: BRD0191-08** | | | | **Extracted: 04/16/08 16:46** | | | | | |
| Arsenic | EPA 6020 | ND | --- | 0.00100 | mg/l | 1x | ND | -- | -- | -- | 29.1% | (20) | 04/18/08 09:25 | **R4** |
| Manganese | " | 0.160 | --- | 0.0100 | " | " | 0.169 | -- | -- | -- | 5.23% | " | " | |
| Chromium | " | ND | --- | 0.00100 | " | " | ND | -- | -- | -- | 39.2% | " | " | **R4** |
| **Matrix Spike (8D16049-MS1)** | | | | | **QC Source: BRD0191-08** | | | | **Extracted: 04/16/08 16:46** | | | | | |
| Manganese | EPA 6020 | 0.244 | --- | 0.0100 | mg/l | 1x | 0.169 | 0.0800 | 93.4% | (65-145) | -- | -- | 04/18/08 09:19 | |
| Arsenic | " | 0.0793 | --- | 0.00100 | " | " | 0.000440 | " | 98.5% | (75-125) | -- | -- | " | |
| Chromium | " | 0.0777 | --- | 0.00100 | " | " | 0.000610 | " | 96.4% | (80-120) | -- | -- | " | |
| **Post Spike (8D16049-PS1)** | | | | | **QC Source: BRD0191-08** | | | | **Extracted: 04/16/08 16:46** | | | | | |
| Chromium | EPA 6020 | 0.0924 | --- | | ug/ml | 1x | 0.000610 | 0.100 | 91.3% | (75-125) | -- | -- | 04/18/08 09:13 | |
| Manganese | " | 0.250 | --- | | " | " | 0.169 | " | 81.1% | " | -- | -- | " | |
| Arsenic | " | 0.0948 | --- | | " | " | 0.000440 | 0.0995 | 94.9% | " | -- | -- | " | |

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Total Metals by EPA 6000/7000 Series Methods - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D16050** **Water Preparation Method: EPA 3010A**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D16050-BLK1)** | | | | | | | | **Extracted: 04/16/08 16:48** | | | | | | |
| Iron | EPA 6010B | ND | --- | 0.150 | mg/l | 1x | -- | -- | -- | -- | -- | -- | 04/17/08 15:43 | |
| **LCS (8D16050-BS1)** | | | | | | | | **Extracted: 04/16/08 16:48** | | | | | | |
| Iron | EPA 6010B | 5.52 | --- | 0.150 | mg/l | 1x | -- | 5.00 | 110% | (80-120) | -- | -- | 04/17/08 15:46 | |
| **Duplicate (8D16050-DUP1)** | | | | **QC Source: BRD0203-01** | | | | **Extracted: 04/16/08 16:48** | | | | | | |
| Iron | EPA 6010B | 87.8 | --- | 0.150 | mg/l | 1x | 91.0 | -- | -- | -- | 3.53% | (30) | 04/17/08 15:53 | |
| **Matrix Spike (8D16050-MS1)** | | | | **QC Source: BRD0203-01** | | | | **Extracted: 04/16/08 16:48** | | | | | | |
| Iron | EPA 6010B | 97.9 | --- | 0.150 | mg/l | 1x | 91.0 | 5.00 | 138% | (78-130) | -- | -- | 04/17/08 15:49 | **M1** |
| **Post Spike (8D16050-PS1)** | | | | **QC Source: BRD0203-01** | | | | **Extracted: 04/16/08 16:48** | | | | | | |
| Iron | EPA 6010B | 93.8 | --- | | ug/ml | 1x | 91.0 | 5.00 | 57.0% | (75-125) | -- | -- | 04/17/08 16:07 | **S3** |

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Kate Haney, Project Manager

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

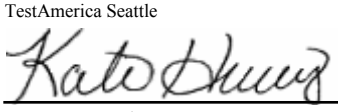
## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D21053** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D21053-BLK1)** | | | | | | | | **Extracted: 04/21/08 23:36** | | | | | | |
| Acetone | EPA 8260B | ND | --- | 10.0 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 04/22/08 05:34 | |
| Benzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromobenzene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromochloromethane | " | ND | --- | 0.250 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromodichloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 0.250 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 2-Butanone | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| n-Butylbenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| sec-Butylbenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| tert-Butylbenzene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon disulfide | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 2-Chlorotoluene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 4-Chlorotoluene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dibromo-3-chloropropane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dibromoethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromomethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dichlorodifluoromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichloropropane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 2,2-Dichloropropane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Ethylbenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |

TestAmerica Seattle



Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D21053** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D21053-BLK1)** | | | | | | | **Extracted: 04/21/08 23:36** | | | | | | | |
| Hexachlorobutadiene | EPA 8260B | ND | --- | 2.50 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 04/22/08 05:34 | |
| Methyl tert-butyl ether | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| n-Hexane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 2-Hexanone | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Isopropylbenzene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| p-Isopropyltoluene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 4-Methyl-2-pentanone | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Naphthalene | " | ND | --- | 2.50 | " | " | -- | -- | -- | -- | -- | -- | " | |
| n-Propylbenzene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Styrene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2,3-Trichlorobenzene | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | B4 |
| 1,2,4-Trichlorobenzene | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1,2-Tetrachloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Toluene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2,3-Trichloropropane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2,4-Trimethylbenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3,5-Trimethylbenzene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| o-Xylene | " | ND | --- | 0.250 | " | " | -- | -- | -- | -- | -- | -- | " | |
| m,p-Xylene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Total Xylenes | " | ND | --- | 0.750 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | *Recovery:* | *103%* | *Limits:* | *76-138%* | *"* | | | | | | | *04/22/08 05:34* | |
| | *Toluene-d8* | | *98.0%* | | *80-120%* | *"* | | | | | | | *"* | |
| | *4-BFB* | | *98.2%* | | *80-120%* | *"* | | | | | | | *"* | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D21053** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LCS (8D21053-BS1)** | | | | | | | | **Extracted: 04/21/08 23:36** | | | | | | |
| Benzene | EPA 8260B | 41.5 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 104% | (80-120) | -- | -- | 04/22/08 04:32 | |
| Chlorobenzene | " | 42.8 | --- | 0.200 | " | " | -- | " | 107% | " | -- | -- | " | |
| 1,1-Dichloroethene | " | 44.8 | --- | 0.200 | " | " | -- | " | 112% | " | -- | -- | " | |
| Methyl tert-butyl ether | " | 39.1 | --- | 1.00 | " | " | -- | " | 97.7% | " | -- | -- | " | |
| Toluene | " | 40.1 | --- | 0.200 | " | " | -- | " | 100% | (75-125) | -- | -- | " | |
| Trichloroethene | " | 41.6 | --- | 0.200 | " | " | -- | " | 104% | (80-120) | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 99.2%* | | | *Limits: 76-138%* | " | | | | | | | *04/22/08 04:32* | |
| *Toluene-d8* | | *96.8%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *97.0%* | | | *80-120%* | " | | | | | | | " | |
| **LCS Dup (8D21053-BSD1)** | | | | | | | | **Extracted: 04/21/08 23:36** | | | | | | |
| Benzene | EPA 8260B | 43.0 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 107% | (80-120) | 3.46% | (20) | 04/22/08 04:57 | |
| Chlorobenzene | " | 45.6 | --- | 0.200 | " | " | -- | " | 114% | " | 6.36% | " | " | |
| 1,1-Dichloroethene | " | 45.3 | --- | 0.200 | " | " | -- | " | 113% | " | 1.20% | " | " | |
| Methyl tert-butyl ether | " | 39.0 | --- | 1.00 | " | " | -- | " | 97.6% | " | 0.128% | " | " | |
| Toluene | " | 43.2 | --- | 0.200 | " | " | -- | " | 108% | (75-125) | 7.32% | " | " | |
| Trichloroethene | " | 41.9 | --- | 0.200 | " | " | -- | " | 105% | (80-120) | 0.815% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 97.5%* | | | *Limits: 76-138%* | " | | | | | | | *04/22/08 04:57* | |
| *Toluene-d8* | | *99.8%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *103%* | | | *80-120%* | " | | | | | | | " | |

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Kate Haney, Project Manager

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| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D23010** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D23010-BLK1)** | | | | | | | **Extracted: 04/23/08 12:31** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 0.250 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 04/23/08 14:55 | |
| Bromodichloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 0.250 | " | " | -- | -- | -- | -- | -- | -- | " | **B4** |
| Bromomethane | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | 0.220 | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | **B** |
| 1,3-Dichlorobenzene | " | 0.200 | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | **B** |
| 1,4-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | **B4** |
| 1,1-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 101%* | | | | *Limits: 76-138%* | " | | | | | | *04/23/08 14:55* | |
| *Toluene-d8* | | *111%* | | | | *80-120%* | " | | | | | | *"* | |
| *4-BFB* | | *99.1%* | | | | *80-120%* | " | | | | | | *"* | |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D23010** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LCS (8D23010-BS1)** | | | | | | | **Extracted: 04/23/08 12:31** | | | | | | | |
| Chlorobenzene | EPA 8260B | 40.7 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 102% | (80-120) | -- | -- | 04/23/08 13:51 | |
| 1,1-Dichloroethene | " | 44.0 | --- | 0.200 | " | " | -- | " | 110% | " | -- | -- | " | |
| Trichloroethene | " | 40.6 | --- | 0.200 | " | " | -- | " | 102% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 105%* | | | *Limits: 76-138%* | " | | | | | | | *04/23/08 13:51* | |
| *Toluene-d8* | | *108%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *105%* | | | *80-120%* | " | | | | | | | " | |
| **LCS Dup (8D23010-BSD1)** | | | | | | | **Extracted: 04/23/08 12:31** | | | | | | | |
| Chlorobenzene | EPA 8260B | 41.9 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 105% | (80-120) | 3.03% | (20) | 04/23/08 14:18 | |
| 1,1-Dichloroethene | " | 46.9 | --- | 0.200 | " | " | -- | " | 117% | " | 6.35% | " | " | |
| Trichloroethene | " | 42.2 | --- | 0.200 | " | " | -- | " | 106% | " | 3.84% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 102%* | | | *Limits: 76-138%* | " | | | | | | | *04/23/08 14:18* | |
| *Toluene-d8* | | *103%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *105%* | | | *80-120%* | " | | | | | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 12:03 |

## Notes and Definitions

Report Specific Notes:

| | | |
|---|---|---|
| B | - | Analyte was detected in the associated Method Blank. |
| B4 | - | Target analyte detected in blank at/above method acceptance criteria. |
| M1 | - | The MS and/or MSD were above the acceptance limits due to sample matrix interference. See Blank Spike (LCS). |
| R4 | - | Due to the low levels of analyte in the sample, the duplicate RPD calculation does not provide useful information. |
| S3 | - | Post digestion spike is out of acceptance limits for this analyte |

Laboratory Reporting Conventions:

| | | |
|---|---|---|
| DET | - | Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only. |
| ND | - | Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate). |
| NR/NA | - | Not Reported / Not Available |
| dry | - | Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight. |
| wet | - | Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis. |
| RPD | - | RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries). |
| MRL | - | METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table. |
| MDL* | - | METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results. |
| Dil | - | Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data. |
| Reporting Limits | - | Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable. |
| Electronic Signature | - | Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature. |

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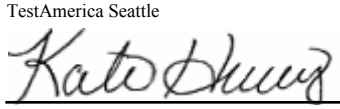

Kate Haney, Project Manager

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9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


# CHAIN OF CUSTODY REPORT

**Work Order #:** BRD0213

CLIENT: ERM

REPORT TO: Kevin Kreseck

ADDRESS: 915 118th Ave SE Bellevue WA 98005

PHONE: 425-462-8599 FAX:

INVOICE TO:

P.O. NUMBER:

PROJECT NAME: Normandy Park

PROJECT NUMBER: 75720

SAMPLED BY: Kevin Kreseck

**TURNAROUND REQUEST** in Business Days *

Organic & Inorganic Analyses: [10] STD. [7] [5] [4] [3] [2] [1] [<1]

Petroleum Hydrocarbon Analyses: [5] STD. [4] [3] [2] [1] [<1]

[OTHER] Specify:

* Turnaround Requests less than standard may incur Rush Charges.

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | PRESERVATIVE | REQUESTED ANALYSES: 8260B VOC | 8260B cVOC | 8260B NWTPH-HCID | Metals (As,Fe,Mn) (dissolved) | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MW-5 | 4/11/08 1554 | | | | X | | W | 2 | | -01 |
| 2 | MW-5 | 4/11/08 1515 | | X | | | | W | 3 | | -02 |
| 3 | MW-5 | 4/11/08 1552 | | | | | X | W | 1 | | -03 |
| 4 | MW-3 | 4/14/08 0941 | | | X | | | W | 3 | | -04 |
| 5 | MW-4 | 4/14/08 0846 | | | X | | | W | 3 | | -05 |
| 6 | DC-4 | 4/14/08 1020 | | | X | | | W | 3 | | -06 |
| 7 | DC-4 | 4/14/08 1020 | | | | | X | W | 1 | | -07 |
| 8 | DC-3 | 4/14/08 1050 | | | X | | | W | 3 | | -08 |
| 9 | DC-3 | 4/14/08 1050 | | | | | X | W | 1 | | -09 |
| 10 | DC-2 | 4/14/08 1136 | | | X | | | W | 3 | | -10 |

RELEASED BY: PRINT NAME: Kevin Kreseck FIRM: ERM DATE: 4/14/08 TIME: 1714

RECEIVED BY: PRINT NAME: Francisco Lang Jr FIRM: TA-SEA DATE: 4/15/08 TIME: 1355

RELEASED BY: PRINT NAME: FIRM: DATE: TIME:

RECEIVED BY: PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS: @Lab 1420 w/o

TEMP: 4.4°C



TAL-1000(0108)

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9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


# CHAIN OF CUSTODY REPORT

**Work Order #:** BRD0213

CLIENT: ERM

REPORT TO: Kevin Kreseh

ADDRESS: 915 118th Ave SE Bellevue WA 98005

PHONE: 425-462-8551 FAX:

INVOICE TO:

P.O. NUMBER:

PROJECT NAME: Normandy Park

PROJECT NUMBER: 75720

SAMPLED BY: Kevin Kreseh

**TURNAROUND REQUEST** in Business Days *

Organic & Inorganic Analyses: [10] STD. [7] [5] [4] [3] [2] [1] [<1]

Petroleum Hydrocarbon Analyses: [5] STD. [4] [3] [2] [1] [<1]

[OTHER] Specify:

* Turnaround Requests less than standard may incur Rush Charges.

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | VOC 8260B | CVOC 8260B | Metals (As, Cr, Fe, Mn) | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | DC-2 | 4/14/08 1136 | | | X | W | 1 | | -11 |
| 2 | DC-19 | 4/14/08 1233 | | X | | W | 3 | | -12 |
| 3 | KMW-1 | 4/14/08 1320 | | X | | W | 3 | | -13 |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |

PRESERVATIVE

REQUESTED ANALYSES

RELEASED BY: PRINT NAME: Kevin Kreseh FIRM: ERM DATE: 4/14/08 TIME: 1714

RECEIVED BY: PRINT NAME: Francisco Luna, Jr. FIRM: TA-SEA DATE: 4/15/08 TIME: 1355

RELEASED BY: PRINT NAME: FIRM: DATE: TIME:

RECEIVED BY: PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS: @Lab 1420 w/c

TEMP: °C 4.4



TAL-1000(0108)

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
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PH: (425) 420.9200 FAX: (425) 420.9210

April 25, 2008

Kevin Knesek
ERM-Bellevue
915-118th Avenue S.E., Suite 130
Bellevue, WA 98005

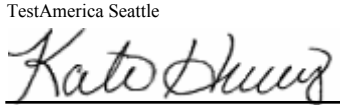
RE: Normandy Park

Enclosed are the results of analyses for samples received by the laboratory on 04/17/08 12:55. The following list is a summary of the Work Orders contained in this report, generated on 04/25/08 14:23.

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

| Work Order | Project | ProjectNumber |
|---|---|---|
| BRD0257 | Normandy Park | 75720 |

TestAmerica Seattle



Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| KMW-7 | BRD0257-01 | Water | 04/15/08 11:45 | 04/17/08 12:55 |
| MW-6 | BRD0257-02 | Water | 04/15/08 12:26 | 04/17/08 12:55 |
| DC-9b | BRD0257-03 | Water | 04/15/08 13:38 | 04/17/08 12:55 |
| KMW-2 | BRD0257-04 | Water | 04/16/08 13:00 | 04/17/08 12:55 |
| DC-8 | BRD0257-05 | Water | 04/16/08 14:16 | 04/17/08 12:55 |
| KMW-8 | BRD0257-06 | Water | 04/15/08 13:08 | 04/17/08 12:55 |
| DC-7 | BRD0257-07 | Water | 04/16/08 15:05 | 04/17/08 12:55 |
| MW-7 | BRD0257-08 | Water | 04/16/08 16:02 | 04/17/08 12:55 |
| DC-17 | BRD0257-09 | Water | 04/16/08 17:02 | 04/17/08 12:55 |
| DC-13 | BRD0257-10 | Water | 04/16/08 17:38 | 04/17/08 12:55 |

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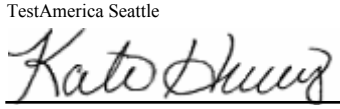

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Dissolved Metals by EPA 6000/7000 Series Methods

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0257-02 (MW-6)** | | **Water** | | | **Sampled: 04/15/08 12:26** | | | | | **P7** |
| Arsenic | EPA 6020 - Diss | ND | ----- | 0.00100 | mg/l | 1x | 8D22001 | 04/22/08 07:00 | 04/22/08 10:30 | |
| Chromium | " | ND | ----- | 0.00100 | " | " | " | " | " | |
| Iron | EPA 6010B - Diss | ND | ----- | 0.150 | " | " | 8D23025 | 04/23/08 10:03 | 04/23/08 13:24 | |
| **BRD0257-02RE1 (MW-6)** | | **Water** | | | **Sampled: 04/15/08 12:26** | | | | | **P7** |
| **Manganese** | EPA 6020 - Diss | **0.924** | ----- | 0.0500 | mg/l | 5x | 8D22001 | 04/22/08 07:00 | 04/22/08 13:07 | |
| **BRD0257-03 (DC-9b)** | | **Water** | | | **Sampled: 04/15/08 13:38** | | | | | **P7** |
| Arsenic | EPA 6020 - Diss | ND | ----- | 0.00100 | mg/l | 1x | 8D22001 | 04/22/08 07:00 | 04/22/08 10:36 | |
| Chromium | " | ND | ----- | 0.00100 | " | " | " | " | " | |
| Iron | EPA 6010B - Diss | ND | ----- | 0.150 | " | " | 8D23025 | 04/23/08 10:03 | 04/23/08 13:28 | |
| Manganese | EPA 6020 - Diss | ND | ----- | 0.0100 | " | " | 8D22001 | 04/22/08 07:00 | 04/22/08 10:36 | |
| **BRD0257-04 (KMW-2)** | | **Water** | | | **Sampled: 04/16/08 13:00** | | | | | **P7** |
| Arsenic | EPA 6020 - Diss | ND | ----- | 0.00100 | mg/l | 1x | 8D22001 | 04/22/08 07:00 | 04/22/08 10:42 | |
| Chromium | " | ND | ----- | 0.00100 | " | " | " | " | " | |
| Iron | EPA 6010B - Diss | ND | ----- | 0.150 | " | " | 8D23025 | 04/23/08 10:03 | 04/23/08 13:31 | |
| Manganese | EPA 6020 - Diss | ND | ----- | 0.0100 | " | " | 8D22001 | 04/22/08 07:00 | 04/22/08 10:42 | |
| **BRD0257-05 (DC-8)** | | **Water** | | | **Sampled: 04/16/08 14:16** | | | | | **P7** |
| Arsenic | EPA 6020 - Diss | ND | ----- | 0.00100 | mg/l | 1x | 8D22001 | 04/22/08 07:00 | 04/22/08 10:48 | |
| Chromium | " | ND | ----- | 0.00100 | " | " | " | " | " | |
| Iron | EPA 6010B - Diss | ND | ----- | 0.150 | " | " | 8D23025 | 04/23/08 10:03 | 04/23/08 13:35 | |
| Manganese | EPA 6020 - Diss | ND | ----- | 0.0100 | " | " | 8D22001 | 04/22/08 07:00 | 04/22/08 10:48 | |
| **BRD0257-06 (KMW-8)** | | **Water** | | | **Sampled: 04/15/08 13:08** | | | | | **P7** |
| Arsenic | EPA 6020 - Diss | ND | ----- | 0.00100 | mg/l | 1x | 8D22001 | 04/22/08 07:00 | 04/22/08 10:54 | |
| Chromium | " | ND | ----- | 0.00100 | " | " | " | " | " | |
| Iron | EPA 6010B - Diss | ND | ----- | 0.150 | " | " | 8D23025 | 04/23/08 10:03 | 04/23/08 13:38 | |
| Manganese | EPA 6020 - Diss | ND | ----- | 0.0100 | " | " | 8D22001 | 04/22/08 07:00 | 04/22/08 10:54 | |

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Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Dissolved Metals by EPA 6000/7000 Series Methods

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0257-07 (DC-7)** | | **Water** | | | **Sampled: 04/16/08 15:05** | | | | | **P7** |
| Arsenic | EPA 6020 - Diss | ND | ----- | 0.00100 | mg/l | 1x | 8D22001 | 04/22/08 07:00 | 04/22/08 11:00 | |
| Chromium | " | ND | ----- | 0.00100 | " | " | " | " | " | |
| Iron | EPA 6010B - Diss | ND | ----- | 0.150 | " | " | 8D23025 | 04/23/08 10:03 | 04/23/08 13:41 | |
| Manganese | EPA 6020 - Diss | ND | ----- | 0.0100 | " | " | 8D22001 | 04/22/08 07:00 | 04/22/08 11:00 | |
| **BRD0257-08 (MW-7)** | | **Water** | | | **Sampled: 04/16/08 16:02** | | | | | **P7** |
| Arsenic | EPA 6020 - Diss | ND | ----- | 0.00100 | mg/l | 1x | 8D22001 | 04/22/08 07:00 | 04/22/08 11:06 | |
| Chromium | " | ND | ----- | 0.00100 | " | " | " | " | " | |
| Iron | EPA 6010B - Diss | ND | ----- | 0.150 | " | " | 8D23025 | 04/23/08 10:03 | 04/23/08 13:45 | |
| **Manganese** | EPA 6020 - Diss | **0.0797** | ----- | 0.0100 | " | " | 8D22001 | 04/22/08 07:00 | 04/22/08 11:06 | |

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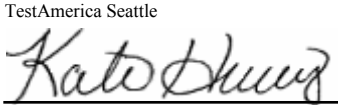

Kate Haney, Project Manager

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

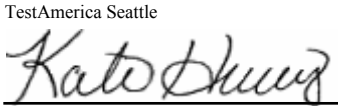
| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0257-01 (KMW-7)** | | **Water** | | | **Sampled: 04/15/08 11:45** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D23010 | 04/23/08 12:31 | 04/23/08 21:42 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **1.33** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **3.88** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | *101%* | | *76 - 138 %* | " | | | | " | |
| | *Toluene-d8* | *96.6%* | | *80 - 120 %* | " | | | | " | |
| | *4-BFB* | *99.2%* | | *80 - 120 %* | " | | | | " | |

TestAmerica Seattle



Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0257-02 (MW-6)** | | **Water** | | | **Sampled: 04/15/08 12:26** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D23010 | 04/23/08 12:31 | 04/23/08 22:09 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **1.99** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | | *98.8%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | *99.2%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | *96.2%* | | *80 - 120 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

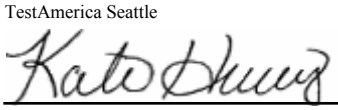
| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0257-03 (DC-9b)** | | **Water** | | | **Sampled: 04/15/08 13:38** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D23010 | 04/23/08 12:31 | 04/23/08 22:36 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **1.27** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **0.640** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | *98.6%* | | *76 - 138 %* | " | | | | " | |
| | *Toluene-d8* | *96.4%* | | *80 - 120 %* | " | | | | " | |
| | *4-BFB* | *94.6%* | | *80 - 120 %* | " | | | | " | |

TestAmerica Seattle



Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0257-04 (KMW-2)** | | **Water** | | | **Sampled: 04/16/08 13:00** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D24004 | 04/24/08 08:23 | 04/24/08 11:14 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **0.640** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **95.8** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| **Trichloroethene** | " | **0.230** | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | | *92.6%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | *98.5%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | *102%* | | *80 - 120 %* | " | | | " | |

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Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0257-05 (DC-8)** | | **Water** | | | **Sampled: 04/16/08 14:16** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D24004 | 04/24/08 08:23 | 04/24/08 11:41 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **0.370** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **39.4** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | *94.5%* | | *76 - 138 %* | " | | | | " | |
| | *Toluene-d8* | *101%* | | *80 - 120 %* | " | | | | " | |
| | *4-BFB* | *98.8%* | | *80 - 120 %* | " | | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0257-06 (KMW-8)** | | **Water** | | | **Sampled: 04/15/08 13:08** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D24004 | 04/24/08 08:23 | 04/24/08 12:08 | |
| **Bromodichloromethane** | " | **0.310** | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **1.13** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **17.4** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *95.6%* | | *76 - 138 %* | " | | | " | |
| *Toluene-d8* | | | *97.8%* | | *80 - 120 %* | " | | | " | |
| *4-BFB* | | | *98.8%* | | *80 - 120 %* | " | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0257-07 (DC-7)** | | **Water** | | | **Sampled: 04/16/08 15:05** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D24004 | 04/24/08 08:23 | 04/24/08 12:35 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **1.08** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **50.8** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | *95.6%* | | *76 - 138 %* | " | | | | " | |
| | *Toluene-d8* | *98.3%* | | *80 - 120 %* | " | | | | " | |
| | *4-BFB* | *96.2%* | | *80 - 120 %* | " | | | | " | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0257-08 (MW-7)** | | **Water** | | | **Sampled: 04/16/08 16:02** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D24004 | 04/24/08 08:23 | 04/24/08 13:02 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **1.12** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **22.4** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | *96.4%* | | *76 - 138 %* | " | | | | " | |
| | *Toluene-d8* | *97.9%* | | *80 - 120 %* | " | | | | " | |
| | *4-BFB* | *95.0%* | | *80 - 120 %* | " | | | | " | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0257-09 (DC-17)** | | **Water** | | | **Sampled: 04/16/08 17:02** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D24004 | 04/24/08 08:23 | 04/24/08 13:29 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **0.750** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **74.6** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | *97.8%* | | *76 - 138 %* | " | | | | " | |
| | *Toluene-d8* | *97.4%* | | *80 - 120 %* | " | | | | " | |
| | *4-BFB* | *95.5%* | | *80 - 120 %* | " | | | | " | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRD0257-10 (DC-13)** | | **Water** | | | **Sampled: 04/16/08 17:38** | | | | | |
| Bromochloromethane | EPA 8260B | ND | ----- | 0.250 | ug/l | 1x | 8D24004 | 04/24/08 08:23 | 04/24/08 13:56 | |
| Bromodichloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.250 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 2.00 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| **Chloroform** | " | **0.280** | ----- | 0.200 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 1.00 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 5.00 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| **Tetrachloroethene** | " | **23.0** | ----- | 0.200 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.200 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.500 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.200 | " | " | " | " | " | |
| *Surrogate(s):* | *1,2-DCA-d4* | *95.8%* | | *76 - 138 %* | " | | | | " | |
| | *Toluene-d8* | *97.8%* | | *80 - 120 %* | " | | | | " | |
| | *4-BFB* | *94.7%* | | *80 - 120 %* | " | | | | " | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Dissolved Metals by EPA 6000/7000 Series Methods - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D22001** **Water Preparation Method: EPA 3005A**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D22001-BLK1)** | | | | | | | | **Extracted: 04/22/08 07:00** | | | | | | |
| Manganese | EPA 6020 - Diss | ND | --- | 0.0100 | mg/l | 1x | -- | -- | -- | -- | -- | -- | 04/22/08 09:54 | |
| Chromium | " | ND | --- | 0.00100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Arsenic | " | ND | --- | 0.00100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| **LCS (8D22001-BS1)** | | | | | | | | **Extracted: 04/22/08 07:00** | | | | | | |
| Manganese | EPA 6020 - Diss | 0.202 | --- | 0.0100 | mg/l | 1x | -- | 0.200 | 101% | (80-120) | -- | -- | 04/22/08 10:12 | |
| Chromium | " | 0.202 | --- | 0.00100 | " | " | -- | " | 101% | " | -- | -- | " | |
| Arsenic | " | 0.194 | --- | 0.00100 | " | " | -- | " | 97.1% | " | -- | -- | " | |
| **Duplicate (8D22001-DUP1)** | | | | | **QC Source: BRD0257-02** | | | **Extracted: 04/22/08 07:00** | | | | | | |
| Chromium | EPA 6020 - Diss | ND | --- | 0.00100 | mg/l | 1x | ND | -- | -- | -- | 3.85% | (20) | 04/22/08 10:24 | |
| Arsenic | " | ND | --- | 0.00100 | " | " | ND | -- | -- | -- | 7.41% | " | " | |
| **Duplicate (8D22001-DUP2)** | | | | | **QC Source: BRD0257-02RE1** | | | **Extracted: 04/22/08 07:00** | | | | | | |
| Manganese | EPA 6020 - Diss | 0.967 | --- | 0.0500 | mg/l | 5x | 0.924 | -- | -- | -- | 4.55% | (20) | 04/22/08 13:01 | |
| **Matrix Spike (8D22001-MS1)** | | | | | **QC Source: BRD0257-02** | | | **Extracted: 04/22/08 07:00** | | | | | | |
| Chromium | EPA 6020 - Diss | 0.104 | --- | 0.00100 | mg/l | 1x | 0.000530 | 0.100 | 103% | (75-125) | -- | -- | 04/22/08 10:18 | |
| Arsenic | " | 0.108 | --- | 0.00100 | " | " | 0.000130 | 0.0995 | 108% | (80-125) | -- | -- | " | |
| **Matrix Spike (8D22001-MS2)** | | | | | **QC Source: BRD0257-02RE1** | | | **Extracted: 04/22/08 07:00** | | | | | | |
| Manganese | EPA 6020 - Diss | 1.06 | --- | 0.0500 | mg/l | 5x | 0.924 | 0.100 | 136% | (75-125) | -- | -- | 04/22/08 12:55 | **MHA** |

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Kate Haney, Project Manager

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Dissolved Metals by EPA 6000/7000 Series Methods - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D23025** **Water Preparation Method: EPA 3005A**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D23025-BLK1)** | | | | | | | | **Extracted: 04/23/08 10:03** | | | | | | |
| Iron | EPA 6010B - Diss | ND | --- | 0.150 | mg/l | 1x | -- | -- | -- | -- | -- | -- | 04/23/08 11:54 | |
| **Blank (8D23025-BLK2)** | | | | | | | | **Extracted: 04/23/08 10:03** | | | | | | |
| Iron | EPA 6010B - Diss | ND | --- | 0.150 | mg/l | 1x | -- | -- | -- | -- | -- | -- | 04/23/08 11:57 | |
| **LCS (8D23025-BS1)** | | | | | | | | **Extracted: 04/23/08 10:03** | | | | | | |
| Iron | EPA 6010B - Diss | 5.61 | --- | 0.150 | mg/l | 1x | -- | 5.00 | 112% | (80-120) | -- | -- | 04/23/08 12:01 | |
| **Duplicate (8D23025-DUP1)** | | | | | **QC Source: BRD0207-01** | | | **Extracted: 04/23/08 10:03** | | | | | | |
| Iron | EPA 6010B - Diss | ND | --- | 0.150 | mg/l | 1x | ND | -- | -- | -- | NR | (20) | 04/23/08 12:08 | |
| **Matrix Spike (8D23025-MS1)** | | | | | **QC Source: BRD0207-01** | | | **Extracted: 04/23/08 10:03** | | | | | | |
| Iron | EPA 6010B - Diss | 5.53 | --- | 0.150 | mg/l | 1x | ND | 5.00 | 111% | (80-123) | -- | -- | 04/23/08 12:04 | |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D23010** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D23010-BLK1)** | | | | | | | **Extracted: 04/23/08 12:31** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 0.250 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 04/23/08 14:55 | |
| Bromodichloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 0.250 | " | " | -- | -- | -- | -- | -- | -- | " | **B4** |
| Bromomethane | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | 0.220 | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | **B** |
| 1,3-Dichlorobenzene | " | 0.200 | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | **B** |
| 1,4-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | **B4** |
| 1,1-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 101%* | | | | *Limits: 76-138%* | " | | | | | | *04/23/08 14:55* | |
| *Toluene-d8* | | *111%* | | | | *80-120%* | " | | | | | | *"* | |
| *4-BFB* | | *99.1%* | | | | *80-120%* | " | | | | | | *"* | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D23010** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LCS (8D23010-BS1)** | | | | | | | **Extracted: 04/23/08 12:31** | | | | | | | |
| Chlorobenzene | EPA 8260B | 40.7 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 102% | (80-120) | -- | -- | 04/23/08 13:51 | |
| 1,1-Dichloroethene | " | 44.0 | --- | 0.200 | " | " | -- | " | 110% | " | -- | -- | " | |
| Trichloroethene | " | 40.6 | --- | 0.200 | " | " | -- | " | 102% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 105%* | | | *Limits: 76-138%* | " | | | | | | | *04/23/08 13:51* | |
| *Toluene-d8* | | | *108%* | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | | *105%* | | *80-120%* | " | | | | | | | " | |
| **LCS Dup (8D23010-BSD1)** | | | | | | | **Extracted: 04/23/08 12:31** | | | | | | | |
| Chlorobenzene | EPA 8260B | 41.9 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 105% | (80-120) | 3.03% | (20) | 04/23/08 14:18 | |
| 1,1-Dichloroethene | " | 46.9 | --- | 0.200 | " | " | -- | " | 117% | " | 6.35% | " | " | |
| Trichloroethene | " | 42.2 | --- | 0.200 | " | " | -- | " | 106% | " | 3.84% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 102%* | | | *Limits: 76-138%* | " | | | | | | | *04/23/08 14:18* | |
| *Toluene-d8* | | | *103%* | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | | *105%* | | *80-120%* | " | | | | | | | " | |

**QC Batch: 8D24004** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D24004-BLK1)** | | | | | | | **Extracted: 04/24/08 08:23** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 0.250 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 04/24/08 09:46 | |
| Bromodichloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 0.250 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | 0.240 | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | **B** |
| 1,3-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | **B4** |
| 1,4-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | **B4** |
| 1,1-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |

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Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8D24004** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8D24004-BLK1)** | | | | | | | | | **Extracted: 04/24/08 08:23** | | | | | |
| cis-1,3-Dichloropropene | EPA 8260B | ND | --- | 0.200 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 04/24/08 09:46 | |
| trans-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 93.8%* | | | *Limits: 76-138%* | " | | | | | | | *04/24/08 09:46* | |
| *Toluene-d8* | | *102%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *103%* | | | *80-120%* | " | | | | | | | " | |
| **LCS (8D24004-BS1)** | | | | | | | | | **Extracted: 04/24/08 08:23** | | | | | |
| Chlorobenzene | EPA 8260B | 40.5 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 101% | (80-120) | -- | -- | 04/24/08 08:43 | |
| 1,1-Dichloroethene | " | 39.6 | --- | 0.200 | " | " | -- | " | 99.0% | " | -- | -- | " | |
| Trichloroethene | " | 38.4 | --- | 0.200 | " | " | -- | " | 96.0% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 95.2%* | | | *Limits: 76-138%* | " | | | | | | | *04/24/08 08:43* | |
| *Toluene-d8* | | *102%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *101%* | | | *80-120%* | " | | | | | | | " | |
| **LCS Dup (8D24004-BSD1)** | | | | | | | | | **Extracted: 04/24/08 08:23** | | | | | |
| Chlorobenzene | EPA 8260B | 42.4 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 106% | (80-120) | 4.51% | (20) | 04/24/08 09:10 | |
| 1,1-Dichloroethene | " | 43.0 | --- | 0.200 | " | " | -- | " | 108% | " | 8.28% | " | " | |
| Trichloroethene | " | 40.6 | --- | 0.200 | " | " | -- | " | 101% | " | 5.60% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 99.2%* | | | *Limits: 76-138%* | " | | | | | | | *04/24/08 09:10* | |
| *Toluene-d8* | | *102%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *99.4%* | | | *80-120%* | " | | | | | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Kevin Knesek | 04/25/08 14:23 |

## Notes and Definitions

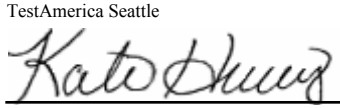
Report Specific Notes:

| | | |
|---|---|---|
| B | - | Analyte was detected in the associated Method Blank. |
| B4 | - | Target analyte detected in blank at/above method acceptance criteria. |
| MHA | - | Due to high levels of analyte in the sample, the MS/MSD calculation does not provide useful spike recovery information. See Blank Spike (LCS). |
| P7 | - | Sample filtered in lab. |

Laboratory Reporting Conventions:

| | | |
|---|---|---|
| DET | - | Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only. |
| ND | - | Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate). |
| NR/NA | - | Not Reported / Not Available |
| dry | - | Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight. |
| wet | - | Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis. |
| RPD | - | RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries). |
| MRL | - | METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table. |
| MDL* | - | METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results. |
| Dil | - | Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data. |
| Reporting Limits | - | Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable. |
| Electronic Signature | - | Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature. |

TestAmerica Seattle



Kate Haney, Project Manager

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9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


## CHAIN OF CUSTODY REPORT

**Work Order #:** BRD0257

CLIENT: ERM

REPORT TO: Kevin Kresch

ADDRESS: 915 118th Ave SE Suite 130 Bellevue WA 98005

PHONE: 425-462-8591 FAX:

INVOICE TO:

P.O. NUMBER:

PROJECT NAME: Normandy Park

PROJECT NUMBER: 75720

SAMPLED BY: Kevin Kresch

**TURNAROUND REQUEST** in Business Days *

Organic & Inorganic Analyses: 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE

REQUESTED ANALYSES

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | CVOC 8260B | Dissolved Metals (As, Cr, Fe, Mn) | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|---|---|
| 1 | KMW-7 | 4/15/08 1145 | X | | W | 3 | | 01 |
| 2 | MW-6 | 4/15/08 1224 | X | X | W | 4 | | 02 |
| 3 | DC-9b | 4/16/08 1338 | X | X | W | 4 | | 03 |
| 4 | KMW-2 | 4/16/08 1300 | X | X | W | 4 | | 04 |
| 5 | DC-8 | 4/16/08 1416 | X | X | W | 4 | | 05 |
| 6 | KMW-8 | 4/15/08 1308 | X | X | W | 4 | | 06 |
| 7 | DC-7 | 4/16/08 1505 | X | X | W | 4 | | 07 |
| 8 | MW-7 | 4/16/08 1602 | X | X | W | 4 | | 08 |
| 9 | DC-17 | 4/16/08 1702 | X | | W | 3 | | 09 |
| 10 | DC-13 | 4/16/08 1738 | X | | W | 3 | | 10 |

RELEASED BY: Kevin Kresch DATE: 4/17/08 TIME: 1255

PRINT NAME: Kevin Kresch FIRM: ERM

RECEIVED BY: Cathy Gamboli DATE: 4/17/08

PRINT NAME: Cathy Gamboli FIRM: TA-Sea TIME: 12:55

RELEASED BY: DATE:

PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:

PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

TEMP:

PAGE OF

CW 041908

Trip blank 04.15.08 1700

W 2

TAL-1000(0108)

-11

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August 08, 2008

Mike Arnold
ERM-Bellevue
915-118th Avenue S.E., Suite 130
Bellevue, WA 98005

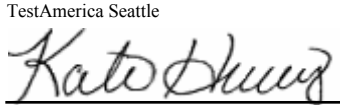
RE: Normandy Park

Enclosed are the results of analyses for samples received by the laboratory on 07/30/08 10:10. The following list is a summary of the Work Orders contained in this report, generated on 08/08/08 16:39.

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

| Work Order | Project | ProjectNumber |
|---|---|---|
| BRG0377 | Normandy Park | 75720 |

TestAmerica Seattle



Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| Drum-1-S | BRG0377-01 | Soil | 07/29/08 10:35 | 07/30/08 10:10 |
| Drum-2-S | BRG0377-02 | Soil | 07/29/08 10:50 | 07/30/08 10:10 |
| Drum-3-W | BRG0377-03 | Water | 07/29/08 11:06 | 07/30/08 10:10 |
| Drum-4-W | BRG0377-04 | Water | 07/29/08 11:16 | 07/30/08 10:10 |
| Drum-5-W | BRG0377-05 | Water | 07/29/08 11:24 | 07/30/08 10:10 |
| Drum-6-W | BRG0377-06 | Water | 07/29/08 11:40 | 07/30/08 10:10 |
| Drum-8-S | BRG0377-07 | Soil | 07/29/08 12:21 | 07/30/08 10:10 |
| Drum-9-S | BRG0377-08 | Soil | 07/29/08 12:33 | 07/30/08 10:10 |
| Drum-11-S | BRG0377-09 | Soil | 07/29/08 12:57 | 07/30/08 10:10 |
| Drum-12-S | BRG0377-10 | Soil | 07/29/08 13:40 | 07/30/08 10:10 |
| Drum-13-S | BRG0377-11 | Soil | 07/29/08 13:50 | 07/30/08 10:10 |
| Drum-14-S | BRG0377-12 | Soil | 07/29/08 14:00 | 07/30/08 10:10 |
| Drum-15-S | BRG0377-13 | Soil | 07/29/08 14:10 | 07/30/08 10:10 |
| Drum-16-S | BRG0377-14 | Soil | 07/29/08 14:15 | 07/30/08 10:10 |
| Drum-17-S | BRG0377-15 | Soil | 07/29/08 14:25 | 07/30/08 10:10 |
| Drum-18-S | BRG0377-16 | Soil | 07/29/08 14:32 | 07/30/08 10:10 |
| Drum-19-S | BRG0377-17 | Soil | 07/29/08 14:40 | 07/30/08 10:10 |
| Drum-20-S | BRG0377-18 | Soil | 07/29/08 14:50 | 07/30/08 10:10 |
| Drum-21-W | BRG0377-19 | Water | 07/29/08 15:02 | 07/30/08 10:10 |
| Drum-22-S | BRG0377-20 | Soil | 07/29/08 15:11 | 07/30/08 10:10 |
| Drum-23-S | BRG0377-21 | Soil | 07/29/08 15:18 | 07/30/08 10:10 |
| Drum-24-S | BRG0377-22 | Soil | 07/29/08 15:27 | 07/30/08 10:10 |

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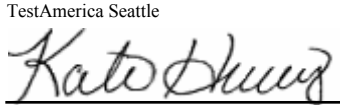

Kate Haney, Project Manager

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BRG0377-01** | **(Drum-1-S)** | | **Soil** | | | **Sampled: 07/29/08 10:35** | | | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 3.01 | ug/kg dry | 1x | 8G31039 | 07/31/08 13:46 | 07/31/08 16:06 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *114%* | | *60 - 140 %* | " | | | " | |
| | *Toluene-d8* | | | *103%* | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | | | *113%* | | *60 - 140 %* | " | | | " | |
| **BRG0377-02** | **(Drum-2-S)** | | **Soil** | | | **Sampled: 07/29/08 10:50** | | | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 3.25 | ug/kg dry | 1x | 8G31039 | 07/31/08 13:46 | 07/31/08 16:33 | **I2** |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *101%* | | *60 - 140 %* | " | | | " | ***I2*** |
| | *Toluene-d8* | | | *107%* | | *60 - 140 %* | " | | | " | ***I2*** |
| | *4-BFB* | | | *109%* | | *60 - 140 %* | " | | | " | ***I2*** |
| **BRG0377-07** | **(Drum-8-S)** | | **Soil** | | | **Sampled: 07/29/08 12:21** | | | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 2.67 | ug/kg dry | 1x | 8G31039 | 07/31/08 13:46 | 07/31/08 16:59 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *99.0%* | | *60 - 140 %* | " | | | " | |
| | *Toluene-d8* | | | *106%* | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | | | *111%* | | *60 - 140 %* | " | | | " | |
| **BRG0377-08** | **(Drum-9-S)** | | **Soil** | | | **Sampled: 07/29/08 12:33** | | | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 2.92 | ug/kg dry | 1x | 8G31039 | 07/31/08 13:46 | 07/31/08 17:26 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *100%* | | *60 - 140 %* | " | | | " | |
| | *Toluene-d8* | | | *104%* | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | | | *109%* | | *60 - 140 %* | " | | | " | |
| **BRG0377-09** | **(Drum-11-S)** | | **Soil** | | | **Sampled: 07/29/08 12:57** | | | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 2.77 | ug/kg dry | 1x | 8G31039 | 07/31/08 13:46 | 07/31/08 17:53 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *103%* | | *60 - 140 %* | " | | | " | |
| | *Toluene-d8* | | | *103%* | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | | | *104%* | | *60 - 140 %* | " | | | " | |
| **BRG0377-10** | **(Drum-12-S)** | | **Soil** | | | **Sampled: 07/29/08 13:40** | | | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 4.55 | ug/kg dry | 1x | 8H06016 | 08/06/08 08:39 | 08/06/08 14:03 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *124%* | | *60 - 140 %* | " | | | " | |
| | *Toluene-d8* | | | *99.6%* | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | | | *108%* | | *60 - 140 %* | " | | | " | |

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| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BRG0377-11** | **(Drum-13-S)** | | **Soil** | | | **Sampled: 07/29/08 13:50** | | | | | |
| **Tetrachloroethene** | | EPA 8260B | **8.65** | ----- | 3.17 | ug/kg dry | 1x | 8G31039 | 07/31/08 13:46 | 07/31/08 18:47 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *106%* | | *60 - 140 %* | " | | | " | |
| | *Toluene-d8* | | | *105%* | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | | | *111%* | | *60 - 140 %* | " | | | " | |
| **BRG0377-12** | **(Drum-14-S)** | | **Soil** | | | **Sampled: 07/29/08 14:00** | | | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 4.49 | ug/kg dry | 1x | 8H06016 | 08/06/08 08:39 | 08/06/08 14:28 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *128%* | | *60 - 140 %* | " | | | " | |
| | *Toluene-d8* | | | *98.1%* | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | | | *102%* | | *60 - 140 %* | " | | | " | |
| **BRG0377-13** | **(Drum-15-S)** | | **Soil** | | | **Sampled: 07/29/08 14:10** | | | | | |
| **Tetrachloroethene** | | EPA 8260B | **4.78** | ----- | 4.73 | ug/kg dry | 1x | 8H06016 | 08/06/08 08:39 | 08/06/08 14:54 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *145%* | | *60 - 140 %* | " | | | " | ***Z2*** |
| | *Toluene-d8* | | | *101%* | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | | | *113%* | | *60 - 140 %* | " | | | " | ***I2*** |
| **BRG0377-14** | **(Drum-16-S)** | | **Soil** | | | **Sampled: 07/29/08 14:15** | | | | | |
| **Tetrachloroethene** | | EPA 8260B | **7.69** | ----- | 3.18 | ug/kg dry | 1x | 8G31039 | 07/31/08 13:46 | 07/31/08 20:08 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *95.5%* | | *60 - 140 %* | " | | | " | |
| | *Toluene-d8* | | | *109%* | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | | | *111%* | | *60 - 140 %* | " | | | " | ***I2*** |
| **BRG0377-20** | **(Drum-22-S)** | | **Soil** | | | **Sampled: 07/29/08 15:11** | | | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 4.59 | ug/kg dry | 1x | 8H06016 | 08/06/08 08:39 | 08/06/08 15:19 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *136%* | | *60 - 140 %* | " | | | " | |
| | *Toluene-d8* | | | *96.5%* | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | | | *108%* | | *60 - 140 %* | " | | | " | |
| **BRG0377-21** | **(Drum-23-S)** | | **Soil** | | | **Sampled: 07/29/08 15:18** | | | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 4.45 | ug/kg dry | 1x | 8H06016 | 08/06/08 08:39 | 08/06/08 15:44 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *133%* | | *60 - 140 %* | " | | | " | |
| | *Toluene-d8* | | | *100%* | | *60 - 140 %* | " | | | " | |
| | *4-BFB* | | | *107%* | | *60 - 140 %* | " | | | " | |

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|---|---|---|---|
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| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method)

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRG0377-22 (Drum-24-S)** | | **Soil** | | | **Sampled: 07/29/08 15:27** | | | | | |
| **Tetrachloroethene** | EPA 8260B | **14.7** | ----- | 4.34 | ug/kg dry | 1x | 8H06016 | 08/06/08 08:39 | 08/06/08 16:09 | |
| *Surrogate(s): 1,2-DCA-d4* | | | *136%* | | *60 - 140 %* | " | | | " | |
| *Toluene-d8* | | | *103%* | | *60 - 140 %* | " | | | " | |
| *4-BFB* | | | *107%* | | *60 - 140 %* | " | | | " | |

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| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B

TestAmerica Seattle

| Analyte | | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BRG0377-15** | **(Drum-17-S)** | | **Soil** | | | | **Sampled: 07/29/08 14:25** | | | | |
| **Tetrachloroethene** | | EPA 8260B | **599** | ----- | 71.0 | ug/kg dry | 1x | 8H04011 | 08/04/08 07:54 | 08/04/08 13:43 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *108%* | | *75 - 125 %* | " | | | " | |
| | *Toluene-d8* | | | *105%* | | *75 - 125 %* | " | | | " | |
| | *4-BFB* | | | *101%* | | *75 - 125 %* | " | | | " | |
| **BRG0377-16** | **(Drum-18-S)** | | **Soil** | | | | **Sampled: 07/29/08 14:32** | | | | |
| **Tetrachloroethene** | | EPA 8260B | **573** | ----- | 65.8 | ug/kg dry | 1x | 8H04011 | 08/04/08 07:54 | 08/04/08 14:08 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *107%* | | *75 - 125 %* | " | | | " | |
| | *Toluene-d8* | | | *107%* | | *75 - 125 %* | " | | | " | |
| | *4-BFB* | | | *104%* | | *75 - 125 %* | " | | | " | |
| **BRG0377-17** | **(Drum-19-S)** | | **Soil** | | | | **Sampled: 07/29/08 14:40** | | | | |
| **Tetrachloroethene** | | EPA 8260B | **215** | ----- | 70.0 | ug/kg dry | 1x | 8H04011 | 08/04/08 07:54 | 08/04/08 14:34 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *104%* | | *75 - 125 %* | " | | | " | |
| | *Toluene-d8* | | | *105%* | | *75 - 125 %* | " | | | " | |
| | *4-BFB* | | | *103%* | | *75 - 125 %* | " | | | " | |
| **BRG0377-18** | **(Drum-20-S)** | | **Soil** | | | | **Sampled: 07/29/08 14:50** | | | | |
| **Tetrachloroethene** | | EPA 8260B | **197** | ----- | 155 | ug/kg dry | 1x | 8H04011 | 08/04/08 07:54 | 08/04/08 14:59 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *105%* | | *75 - 125 %* | " | | | " | |
| | *Toluene-d8* | | | *105%* | | *75 - 125 %* | " | | | " | |
| | *4-BFB* | | | *104%* | | *75 - 125 %* | " | | | " | |

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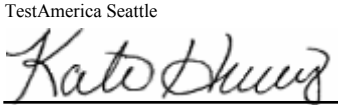

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## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BRG0377-03** | **(Drum-3-W)** | | | **Water** | | | | **Sampled: 07/29/08 11:06** | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 0.200 | ug/l | 1x | 8H05060 | 08/05/08 17:05 | 08/06/08 01:32 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *100%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | | *100%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | | *100%* | | *80 - 120 %* | " | | | " | |
| **BRG0377-04** | **(Drum-4-W)** | | | **Water** | | | | **Sampled: 07/29/08 11:16** | | | |
| **Tetrachloroethene** | | EPA 8260B | **1.02** | ----- | 0.200 | ug/l | 1x | 8H05060 | 08/05/08 17:05 | 08/06/08 01:59 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *101%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | | *100%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | | *101%* | | *80 - 120 %* | " | | | " | |
| **BRG0377-05** | **(Drum-5-W)** | | | **Water** | | | | **Sampled: 07/29/08 11:24** | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 0.200 | ug/l | 1x | 8H05060 | 08/05/08 17:05 | 08/06/08 02:25 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *97.4%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | | *99.3%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | | *99.1%* | | *80 - 120 %* | " | | | " | |
| **BRG0377-06** | **(Drum-6-W)** | | | **Water** | | | | **Sampled: 07/29/08 11:40** | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 0.200 | ug/l | 1x | 8H05060 | 08/05/08 17:05 | 08/06/08 02:52 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *99.2%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | | *99.8%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | | *97.8%* | | *80 - 120 %* | " | | | " | |
| **BRG0377-19** | **(Drum-21-W)** | | | **Water** | | | | **Sampled: 07/29/08 15:02** | | | |
| Tetrachloroethene | | EPA 8260B | ND | ----- | 0.200 | ug/l | 1x | 8H06012 | 08/06/08 10:09 | 08/06/08 12:39 | |
| *Surrogate(s):* | *1,2-DCA-d4* | | | *97.0%* | | *76 - 138 %* | " | | | " | |
| | *Toluene-d8* | | | *99.2%* | | *80 - 120 %* | " | | | " | |
| | *4-BFB* | | | *100%* | | *80 - 120 %* | " | | | " | |

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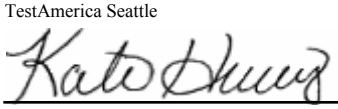

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## Physical Parameters by APHA/ASTM/EPA Methods

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRG0377-01 (Drum-1-S)** | | **Soil** | | | | **Sampled: 07/29/08 10:35** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **87.1** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-02 (Drum-2-S)** | | **Soil** | | | | **Sampled: 07/29/08 10:50** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **84.0** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-07 (Drum-8-S)** | | **Soil** | | | | **Sampled: 07/29/08 12:21** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **83.3** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-08 (Drum-9-S)** | | **Soil** | | | | **Sampled: 07/29/08 12:33** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **83.2** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-09 (Drum-11-S)** | | **Soil** | | | | **Sampled: 07/29/08 12:57** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **94.7** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-10 (Drum-12-S)** | | **Soil** | | | | **Sampled: 07/29/08 13:40** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **86.0** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-11 (Drum-13-S)** | | **Soil** | | | | **Sampled: 07/29/08 13:50** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **92.6** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-12 (Drum-14-S)** | | **Soil** | | | | **Sampled: 07/29/08 14:00** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **93.2** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-13 (Drum-15-S)** | | **Soil** | | | | **Sampled: 07/29/08 14:10** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **93.7** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-14 (Drum-16-S)** | | **Soil** | | | | **Sampled: 07/29/08 14:15** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **95.3** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-15 (Drum-17-S)** | | **Soil** | | | | **Sampled: 07/29/08 14:25** | | | | |

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Kate Haney, Project Manager

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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Physical Parameters by APHA/ASTM/EPA Methods

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRG0377-15 (Drum-17-S)** | | **Soil** | | | | **Sampled: 07/29/08 14:25** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **90.2** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-16 (Drum-18-S)** | | **Soil** | | | | **Sampled: 07/29/08 14:32** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **91.8** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-17 (Drum-19-S)** | | **Soil** | | | | **Sampled: 07/29/08 14:40** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **95.7** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-18 (Drum-20-S)** | | **Soil** | | | | **Sampled: 07/29/08 14:50** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **85.4** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-20 (Drum-22-S)** | | **Soil** | | | | **Sampled: 07/29/08 15:11** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **95.8** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-21 (Drum-23-S)** | | **Soil** | | | | **Sampled: 07/29/08 15:18** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **92.8** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |
| **BRG0377-22 (Drum-24-S)** | | **Soil** | | | | **Sampled: 07/29/08 15:27** | | | | |
| **Dry Weight** | BSOPSPL003R08 | **91.9** | ----- | 1.00 | % | 1x | 8H05048 | 08/05/08 13:38 | 08/06/08 00:00 | |

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|---|---|---|---|
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| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Volatile Organic Compounds (Special List) per EPA Method 8260B (Low Soil Method) - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8G31039** **Soil Preparation Method: EPA 5035**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8G31039-BLK1)** | | | | | | | **Extracted: 07/31/08 13:46** | | | | | | | |
| Tetrachloroethene | EPA 8260B | ND | --- | 5.00 | ug/kg wet | 1x | -- | -- | -- | -- | -- | -- | 07/31/08 15:39 | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 98.4%* | | | *Limits: 60-140%* | " | | | | | | | *07/31/08 15:39* | |
| *Toluene-d8* | | *97.3%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *99.5%* | | | *60-140%* | " | | | | | | | " | |
| **LCS (8G31039-BS1)** | | | | | | | **Extracted: 07/31/08 13:46** | | | | | | | |
| Tetrachloroethene | EPA 8260B | 49.9 | --- | 5.00 | ug/kg wet | 1x | -- | 50.0 | 99.7% | (60-140) | -- | -- | 07/31/08 14:45 | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 95.4%* | | | *Limits: 60-140%* | " | | | | | | | *07/31/08 14:45* | |
| *Toluene-d8* | | *98.3%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *97.7%* | | | *60-140%* | " | | | | | | | " | |
| **LCS Dup (8G31039-BSD1)** | | | | | | | **Extracted: 07/31/08 13:46** | | | | | | | |
| Tetrachloroethene | EPA 8260B | 51.8 | --- | 5.00 | ug/kg wet | 1x | -- | 50.0 | 104% | (60-140) | 3.74% | (25) | 07/31/08 15:12 | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 92.9%* | | | *Limits: 60-140%* | " | | | | | | | *07/31/08 15:12* | |
| *Toluene-d8* | | *100%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *102%* | | | *60-140%* | " | | | | | | | " | |

**QC Batch: 8H06016** **Soil Preparation Method: EPA 5035**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8H06016-BLK1)** | | | | | | | **Extracted: 08/06/08 08:39** | | | | | | | |
| Tetrachloroethene | EPA 8260B | ND | --- | 5.00 | ug/kg wet | 1x | -- | -- | -- | -- | -- | -- | 08/06/08 13:38 | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 113%* | | | *Limits: 60-140%* | " | | | | | | | *08/06/08 13:38* | |
| *Toluene-d8* | | *98.4%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *97.7%* | | | *60-140%* | " | | | | | | | " | |
| **LCS (8H06016-BS1)** | | | | | | | **Extracted: 08/06/08 08:39** | | | | | | | |
| Tetrachloroethene | EPA 8260B | 45.2 | --- | 5.00 | ug/kg wet | 1x | -- | 50.0 | 90.3% | (0-200) | -- | -- | 08/06/08 12:34 | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 99.8%* | | | *Limits: 60-140%* | " | | | | | | | *08/06/08 12:34* | |
| *Toluene-d8* | | *101%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *100%* | | | *60-140%* | " | | | | | | | " | |
| **LCS Dup (8H06016-BSD1)** | | | | | | | **Extracted: 08/06/08 08:39** | | | | | | | |
| Tetrachloroethene | EPA 8260B | 46.2 | --- | 5.00 | ug/kg wet | 1x | -- | 50.0 | 92.5% | (0-200) | 2.36% | (200) | 08/06/08 12:59 | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 103%* | | | *Limits: 60-140%* | " | | | | | | | *08/06/08 12:59* | |
| *Toluene-d8* | | *100%* | | | *60-140%* | " | | | | | | | " | |
| *4-BFB* | | *100%* | | | *60-140%* | " | | | | | | | " | |

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Kate Haney, Project Manager

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8H04011** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8H04011-BLK1)** | | | | | | | **Extracted: 08/04/08 07:54** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 100 | ug/kg wet | 1x | -- | -- | -- | -- | -- | -- | 08/04/08 10:15 | |
| Bromodichloromethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 1000 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 112%* | | | *Limits: 75-125%* | " | | | | | | | *08/04/08 10:15* | |
| *Toluene-d8* | | *104%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *102%* | | | *75-125%* | " | | | | | | | " | |

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Kate Haney, Project Manager

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|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Volatile Organic Compounds (Special List) by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8H04011** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LCS (8H04011-BS1)** | | | | | | | **Extracted: 08/04/08 07:54** | | | | | | | |
| Chlorobenzene | EPA 8260B | 3900 | --- | 100 | ug/kg wet | 1x | -- | 4000 | 97.4% | (75-125) | -- | -- | 08/04/08 08:37 | |
| 1,1-Dichloroethene | " | 3980 | --- | 100 | " | " | -- | " | 99.5% | (69-128) | -- | -- | " | |
| Trichloroethene | " | 3670 | --- | 100 | " | " | -- | " | 91.8% | (75-125) | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 105%* | | | *Limits: 75-125%* | " | | | | | | | *08/04/08 08:37* | |
| *Toluene-d8* | | *104%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *102%* | | | *75-125%* | " | | | | | | | " | |
| **LCS Dup (8H04011-BSD1)** | | | | | | | **Extracted: 08/04/08 07:54** | | | | | | | |
| Chlorobenzene | EPA 8260B | 3760 | --- | 100 | ug/kg wet | 1x | -- | 4000 | 94.0% | (75-125) | 3.60% | (20) | 08/04/08 09:02 | |
| 1,1-Dichloroethene | " | 3900 | --- | 100 | " | " | -- | " | 97.4% | (69-128) | 2.16% | " | " | |
| Trichloroethene | " | 3670 | --- | 100 | " | " | -- | " | 91.8% | (75-125) | 0.109% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 106%* | | | *Limits: 75-125%* | " | | | | | | | *08/04/08 09:02* | |
| *Toluene-d8* | | *102%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *104%* | | | *75-125%* | " | | | | | | | " | |

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|---|---|---|---|
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| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

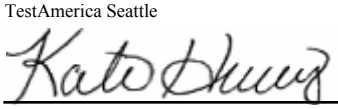
## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8H05060** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8H05060-BLK1)** | | | | | | | **Extracted: 08/05/08 17:05** | | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 0.250 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 08/06/08 01:05 | |
| Bromodichloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 0.250 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 99.4%* | | | *Limits: 76-138%* | " | | | | | | | *08/06/08 01:05* | |
| *Toluene-d8* | | *99.8%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *99.6%* | | | *80-120%* | " | | | | | | | " | |

TestAmerica Seattle



Kate Haney, Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

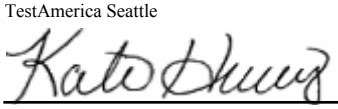
**QC Batch: 8H05060** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LCS (8H05060-BS1)** | | | | | | | | **Extracted: 08/05/08 17:05** | | | | | | |
| Chlorobenzene | EPA 8260B | 36.8 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 92.0% | (80-120) | -- | -- | 08/05/08 23:45 | |
| 1,1-Dichloroethene | " | 38.3 | --- | 0.200 | " | " | -- | " | 95.7% | " | -- | -- | " | |
| Trichloroethene | " | 36.4 | --- | 0.200 | " | " | -- | " | 91.0% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 100%* | | | *Limits: 76-138%* | " | | | | | | | *08/05/08 23:45* | |
| *Toluene-d8* | | *99.2%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *101%* | | | *80-120%* | " | | | | | | | " | |
| **LCS Dup (8H05060-BSD1)** | | | | | | | | **Extracted: 08/05/08 17:05** | | | | | | |
| Chlorobenzene | EPA 8260B | 37.7 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 94.2% | (80-120) | 2.42% | (20) | 08/06/08 08:14 | |
| 1,1-Dichloroethene | " | 38.1 | --- | 0.200 | " | " | -- | " | 95.3% | " | 0.419% | " | " | |
| Trichloroethene | " | 37.4 | --- | 0.200 | " | " | -- | " | 93.6% | " | 2.79% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 101%* | | | *Limits: 76-138%* | " | | | | | | | *08/06/08 08:14* | |
| *Toluene-d8* | | *98.2%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *98.0%* | | | *80-120%* | " | | | | | | | " | |

**QC Batch: 8H06012** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8H06012-BLK1)** | | | | | | | | **Extracted: 08/06/08 10:09** | | | | | | |
| Bromochloromethane | EPA 8260B | ND | --- | 0.250 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 08/06/08 15:00 | |
| Bromodichloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 0.250 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |

TestAmerica Seattle



Kate Haney, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8H06012** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8H06012-BLK1)** | | | | | | | | **Extracted: 08/06/08 10:09** | | | | | | |
| cis-1,3-Dichloropropene | EPA 8260B | ND | --- | 0.200 | ug/l | 1x | -- | -- | -- | -- | -- | -- | 08/06/08 15:00 | |
| trans-1,3-Dichloropropene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 102%* | | | *Limits: 76-138%* | " | | | | | | | *08/06/08 15:00* | |
| *Toluene-d8* | | *99.4%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *98.5%* | | | *80-120%* | " | | | | | | | " | |
| **LCS (8H06012-BS1)** | | | | | | | | **Extracted: 08/06/08 00:09** | | | | | | |
| Chlorobenzene | EPA 8260B | 38.8 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 97.1% | (80-120) | -- | -- | 08/06/08 09:37 | |
| 1,1-Dichloroethene | " | 39.3 | --- | 0.200 | " | " | -- | " | 98.2% | " | -- | -- | " | |
| Trichloroethene | " | 37.9 | --- | 0.200 | " | " | -- | " | 94.8% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 99.4%* | | | *Limits: 76-138%* | " | | | | | | | *08/06/08 09:37* | |
| *Toluene-d8* | | *98.4%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *99.2%* | | | *80-120%* | " | | | | | | | " | |
| **LCS Dup (8H06012-BSD1)** | | | | | | | | **Extracted: 08/06/08 00:09** | | | | | | |
| Chlorobenzene | EPA 8260B | 37.9 | --- | 0.200 | ug/l | 1x | -- | 40.0 | 94.8% | (80-120) | 2.37% | (20) | 08/06/08 10:03 | |
| 1,1-Dichloroethene | " | 38.2 | --- | 0.200 | " | " | -- | " | 95.5% | " | 2.86% | " | " | |
| Trichloroethene | " | 36.7 | --- | 0.200 | " | " | -- | " | 91.8% | " | 3.19% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 97.6%* | | | *Limits: 76-138%* | " | | | | | | | *08/06/08 10:03* | |
| *Toluene-d8* | | *100%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *100%* | | | *80-120%* | " | | | | | | | " | |
| **Matrix Spike (8H06012-MS1)** | | | | | **QC Source: BRH0049-01** | | | **Extracted: 08/06/08 00:09** | | | | | | |
| Chlorobenzene | EPA 8260B | 40.6 | --- | 0.200 | ug/l | 1x | ND | 40.0 | 102% | (75-125) | -- | -- | 08/06/08 10:33 | |
| 1,1-Dichloroethene | " | 43.6 | --- | 0.200 | " | " | ND | " | 109% | (61-120) | -- | -- | " | |
| Trichloroethene | " | 41.0 | --- | 0.200 | " | " | ND | " | 103% | (75-125) | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 101%* | | | *Limits: 76-138%* | " | | | | | | | *08/06/08 10:33* | |
| *Toluene-d8* | | *101%* | | | *80-120%* | " | | | | | | | " | |
| *4-BFB* | | *99.7%* | | | *80-120%* | " | | | | | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8H06012** **Water Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Matrix Spike Dup (8H06012-MSD1)** | | | | **QC Source: BRH0049-01** | | | | **Extracted: 08/06/08 00:09** | | | | | | |
| Chlorobenzene | EPA 8260B | 36.6 | --- | 0.200 | ug/l | 1x | ND | 40.0 | 91.4% | (75-125) | 10.6% | (20) | 08/06/08 11:00 | |
| 1,1-Dichloroethene | " | 38.7 | --- | 0.200 | " | " | ND | " | 96.7% | (61-120) | 12.1% | (30) | " | |
| Trichloroethene | " | 37.1 | --- | 0.200 | " | " | ND | " | 92.8% | (75-125) | 10.1% | (20) | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 102%* | | *Limits: 76-138%* | " | | | | | | | | *08/06/08 11:00* | |
| *Toluene-d8* | | *101%* | | *80-120%* | " | | | | | | | | " | |
| *4-BFB* | | *101%* | | *80-120%* | " | | | | | | | | " | |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
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| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Physical Parameters by APHA/ASTM/EPA Methods - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8H05048** **Soil Preparation Method: Dry Weight**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8H05048-BLK1)** | | | | | | | | **Extracted: 08/05/08 13:38** | | | | | | |
| Dry Weight | BSOPSPL00 3R08 | 100 | --- | 1.00 | % | 1x | -- | -- | -- | -- | -- | -- | 08/06/08 00:00 | |

TestAmerica Seattle

Kate Haney, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **ERM-Bellevue** | Project Name: | **Normandy Park** | |
| 915-118th Avenue S.E., Suite 130 | Project Number: | 75720 | Report Created: |
| Bellevue, WA 98005 | Project Manager: | Mike Arnold | 08/08/08 16:39 |

## Notes and Definitions

Report Specific Notes:

I2 - Internal Standard recovery was outside of method limits.

Z2 - Surrogate recovery was above the acceptance limits. Data not impacted.

Laboratory Reporting Conventions:

DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.

ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).

NR/NA - Not Reported / Not Available

dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.

wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.

RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).

MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.

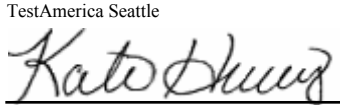
MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.

Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.

Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.

Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Seattle



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9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


# CHAIN OF CUSTODY REPORT

**Work Order #:** BRG0377

CLIENT: ERM

INVOICE TO:

REPORT TO:
ADDRESS: 915 118th Ave SE, Suite 130
Bellevue, WA 98005

PHONE: 425-462-8591 FAX:

P.O. NUMBER:

PROJECT NAME: Normandy Park

PROJECT NUMBER: 75720

SAMPLED BY: Kevin Kreech

**TURNAROUND REQUEST**
in Business Days *
Organic & Inorganic Analyses: 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE

REQUESTED ANALYSES: 8260 PCE only

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|
| 1 | Drum-1-S | 7/29/08 1035 | S | 4 | | -01 |
| 2 | Drum-2-S | 7/29/08 1050 | S | 4 | | -02 |
| 3 | Drum-3-W | 7/29/08 1106 | W | 3 | | -03 |
| 4 | Drum-4-W | 7/29/08 1116 | W | 3 | | -04 |
| 5 | Drum-5-W | 7/29/08 1124 | W | 3 | | -05 |
| 6 | Drum-6-W | 7/29/08 1140 | W | 3 | | -06 |
| 7 | Drum-8-S | 7/29/08 1221 | S | 4 | | -07 |
| 8 | Drum-9-S | 7/29/08 1233 | S | 4 | | -08 |
| 9 | Drum-11-S | 7/29/08 1257 | S | 4 | | -09 |
| 10 | Drum-12-S | 7/29/08 1340 | S | 4 | | -10 |

RELEASED BY: Kevin Kreech — FIRM: ERM — DATE: 7/29/08 — TIME: 1633
RECEIVED BY: — PRINT NAME: Francisco Lugo, Jr — FIRM: TA-SEA — DATE: 7/30/08 — TIME: 0943

RELEASED BY: — PRINT NAME: — FIRM: — DATE: — TIME:
RECEIVED BY: — PRINT NAME: — FIRM: — DATE: — TIME:

ADDITIONAL REMARKS:
Sends Results to Miki.Arnold@erm.com

@Lab 1010 W/CS

TEMP: 6.2°C

PAGE 1 OF 3

TAL-1000(0108)

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9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


# CHAIN OF CUSTODY REPORT

**Work Order #:** BRG0377

CLIENT: ERM

INVOICE TO:

REPORT TO:
ADDRESS: 915 118th Ave SE Suite 130
Bellevue, WA 98005

PHONE: 425-462-8991 FAX:

P.O. NUMBER:

PROJECT NAME: Normandy Park

PROJECT NUMBER: 75720

SAMPLED BY: Kevin Kneedl

**TURNAROUND REQUEST**
in Business Days *

Organic & Inorganic Analyses
10 (X) STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses
5 STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE

REQUESTED ANALYSES

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | 8260 PCE ONLY | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|---|
| 1 | Drum-13-S | 7/29/08 1350 | ✓ | S | 4 | | -11 |
| 2 | Drum-14-S | 7/29/08 1400 | ✓ | S | 4 | | -12 |
| 3 | Drum-15-S | 7/29/08 1410 | ✓ | S | 4 | | -13 |
| 4 | Drum-16-S | 7/29/08 1415 | ✓ | S | 4 | | -14 |
| 5 | Drum-17-S | 7/29/08 1425 | ✓ | S | 4 | | -15 |
| 6 | Drum-18-S | 7/29/08 1432 | ✓ | S | 4 | | -16 |
| 7 | Drum-19-S | 7/29/08 1440 | ✓ | S | 4 | | -17 |
| 8 | Drum-20-S | 7/29/08 1450 | ✓ | S | 4 | | -18 |
| 9 | Drum-21-W | 7/29/08 1502 | ✓ | W | 3 | | -19 |
| 10 | Drum-22-S | 7/29/08 1511 | ✓ | S | 4 | | -20 |

RELEASED BY: [signature]
PRINT NAME: Kevin Kneedl FIRM: ERM DATE: 7/29/08 TIME: 1633

RECEIVED BY: [signature]
PRINT NAME: Francisco Lung, Jr FIRM: TH-SEA DATE: 7/30/08 TIME: 0943

RELEASED BY:
PRINT NAME: FIRM: DATE: TIME:

RECEIVED BY:
PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS: @Lab 10/0 w/cs

TEMP: 6.2 °C

PAGE 2 OF 3

TAL-1000(0108)

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# CHAIN OF CUSTODY REPORT

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INVOICE TO:

REPORT TO: 915 118th Ave SE Suite 130
ADDRESS: Bellevue, WA 98005

PHONE: 425-462-8891 FAX:

P.O. NUMBER:

PROJECT NAME: Normandy Pond

PROJECT NUMBER: 75720

SAMPLED BY: Kevin Kreach

**TURNAROUND REQUEST**
in Business Days *

Organic & Inorganic Analyses: [10] STD. [7] [5] [4] [3] [2] [1] [<1]

Petroleum Hydrocarbon Analyses: [5] STD. [4] [3] [2] [1] [<1]

[OTHER] Specify:

* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE

REQUESTED ANALYSES

8260 BTEX ONLY

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|
| 1 | Drum-23-S | 7/29/08 1518 | S | 4 | | -21 |
| 2 | Drum-24-S | 7/29/08 1527 | S | 4 | | -22 |
| 3 | Trip blank-S | 07.29.08 1633 | S | 1 | | -23 |
| 4 | Trip blank-W | 07.29.08 1633 | W | 1 | | -24 |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |

CW 07.30.08

RELEASED BY: PRINT NAME: Kevin Kreach FIRM: ERM DATE: 7/29/08 TIME: 1633

RECEIVED BY: PRINT NAME: Francisco Lang Jr FIRM: TA-SEA DATE: 7/30/08 TIME: 0943

RELEASED BY: PRINT NAME: FIRM: DATE: TIME:

RECEIVED BY: PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS:

@Lab 1010 w/cs

TEMP: 6.2°C

PAGE 3 OF

TAL-1000(0108)

Lancaster Laboratories

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# Analysis Report

ANALYTICAL RESULTS

Prepared for:

ERM-West, Inc.
1777 Botelho Drive
Suite 260
Walnut Creek CA 94596

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

## SAMPLE GROUP

The sample group for this submittal is 1106844. Samples arrived at the laboratory on Saturday, August 23, 2008. The PO# for this group is 75720.20/OW.

| Client Description | Lancaster Labs Number |
|---|---|
| MW-8 Grab Water Sample | 5449438 |
| MW-9 Grab Water Sample | 5449439 |
| Trip Blank Water Sample | 5449440 |

## METHODOLOGY

The specific methodologies used in obtaining the enclosed analytical results are indicated on the laboratory chronicles.

| | | |
|---|---|---|
| ELECTRONIC COPY TO | ERM-West | Attn: Olivia Williams |
| ELECTRONIC COPY TO | ERM, Inc. | Attn: Mike Arnold |

Lancaster Laboratories

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# Analysis Report

Questions? Contact your Client Services Representative
Wendy A Kozma at (717) 656-2300

Respectfully Submitted,

Christine Dulaney
Senior Specialist

Lancaster Laboratories

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

# Analysis Report



**Lancaster Laboratories Sample No. WW5449438 Group No. 1106844**

**MW-8 Grab Water Sample**

Collected:08/21/2008 16:09 by OW

Account Number: 06735

Submitted: 08/23/2008 10:00
Reported: 09/04/2008 at 16:42
Discard: 09/12/2008

ERM-West, Inc.
1777 Botelho Drive
Suite 260
Walnut Creek CA 94596

06-08 SDG#: PLY06-01

| CAT No. | Analysis Name | CAS Number | As Received Result | | As Received Method Detection Limit | Units | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 02898 | EPA SW846/8260 (water-25ml) #1 | | | | | | |
| 02901 | Dichlorodifluoromethane | 75-71-8 | ND | | 0.1 | ug/l | 1 |
| 02902 | Chloromethane | 74-87-3 | ND | | 0.2 | ug/l | 1 |
| 02903 | Vinyl Chloride | 75-01-4 | ND | | 0.1 | ug/l | 1 |
| 02904 | Bromomethane | 74-83-9 | ND | | 0.1 | ug/l | 1 |
| 02905 | Chloroethane | 75-00-3 | ND | | 0.1 | ug/l | 1 |
| 02906 | Trichlorofluoromethane | 75-69-4 | ND | | 0.1 | ug/l | 1 |
| 02908 | 1,1-Dichloroethene | 75-35-4 | ND | | 0.1 | ug/l | 1 |
| 02910 | Acetone | 67-64-1 | ND | | 3.0 | ug/l | 1 |
| 02912 | Carbon Disulfide | 75-15-0 | ND | | 0.4 | ug/l | 1 |
| 02915 | Methylene Chloride | 75-09-2 | ND | | 0.2 | ug/l | 1 |
| 02918 | trans-1,2-Dichloroethene | 156-60-5 | ND | | 0.1 | ug/l | 1 |
| 02919 | Methyl Tertiary Butyl Ether | 1634-04-4 | ND | | 0.1 | ug/l | 1 |
| 02920 | n-Hexane | 110-54-3 | ND | | 0.1 | ug/l | 1 |
| 02921 | 1,1-Dichloroethane | 75-34-3 | ND | | 0.1 | ug/l | 1 |
| 02929 | 2,2-Dichloropropane | 594-20-7 | ND | | 0.1 | ug/l | 1 |
| 02930 | cis-1,2-Dichloroethene | 156-59-2 | ND | | 0.1 | ug/l | 1 |
| 02931 | 2-Butanone | 78-93-3 | ND | | 1.0 | ug/l | 1 |
| 02933 | Bromochloromethane | 74-97-5 | ND | | 0.1 | ug/l | 1 |
| 02936 | Chloroform | 67-66-3 | 0.3 | J | 0.1 | ug/l | 1 |
| 02938 | 1,1,1-Trichloroethane | 71-55-6 | ND | | 0.1 | ug/l | 1 |
| 02940 | Carbon Tetrachloride | 56-23-5 | ND | | 0.1 | ug/l | 1 |
| 02941 | 1,1-Dichloropropene | 563-58-6 | ND | | 0.1 | ug/l | 1 |
| 02942 | Benzene | 71-43-2 | ND | | 0.1 | ug/l | 1 |
| 02944 | 1,2-Dichloroethane | 107-06-2 | ND | | 0.1 | ug/l | 1 |
| 02954 | Trichloroethene | 79-01-6 | ND | | 0.1 | ug/l | 1 |
| 02956 | 1,2-Dichloropropane | 78-87-5 | ND | | 0.1 | ug/l | 1 |
| 02957 | Dibromomethane | 74-95-3 | ND | | 0.1 | ug/l | 1 |
| 02960 | Bromodichloromethane | 75-27-4 | ND | | 0.1 | ug/l | 1 |
| 02963 | cis-1,3-Dichloropropene | 10061-01-5 | ND | | 0.1 | ug/l | 1 |
| 02964 | 4-Methyl-2-Pentanone | 108-10-1 | ND | | 1.0 | ug/l | 1 |
| 02965 | Toluene | 108-88-3 | ND | | 0.1 | ug/l | 1 |
| 02966 | 1,1,2-Trichloroethane | 79-00-5 | ND | | 0.1 | ug/l | 1 |
| 02967 | trans-1,3-Dichloropropene | 10061-02-6 | ND | | 0.1 | ug/l | 1 |
| 02969 | Tetrachloroethene | 127-18-4 | 0.2 | J | 0.1 | ug/l | 1 |
| 02970 | 1,3-Dichloropropane | 142-28-9 | ND | | 0.1 | ug/l | 1 |
| 02971 | 2-Hexanone | 591-78-6 | ND | | 1.0 | ug/l | 1 |
| 02972 | Dibromochloromethane | 124-48-1 | ND | | 0.1 | ug/l | 1 |
| 02973 | 1,2-Dibromoethane | 106-93-4 | ND | | 0.1 | ug/l | 1 |

**Lancaster Laboratories Sample No. WW5449438** **Group No. 1106844**

**MW-8 Grab Water Sample**

Collected:08/21/2008 16:09 by OW

Account Number: 06735

Submitted: 08/23/2008 10:00
Reported: 09/04/2008 at 16:42
Discard: 09/12/2008

ERM-West, Inc.
1777 Botelho Drive
Suite 260
Walnut Creek CA 94596

06-08 SDG#: PLY06-01

| CAT No. | Analysis Name | CAS Number | As Received Result | As Received Method Detection Limit | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| 02974 | Chlorobenzene | 108-90-7 | ND | 0.1 | ug/l | 1 |
| 02975 | 1,1,1,2-Tetrachloroethane | 630-20-6 | ND | 0.1 | ug/l | 1 |
| 02976 | Ethylbenzene | 100-41-4 | ND | 0.1 | ug/l | 1 |
| 02977 | m+p-Xylene | 1330-20-7 | ND | 0.1 | ug/l | 1 |
| 02978 | o-Xylene | 95-47-6 | ND | 0.1 | ug/l | 1 |
| 02979 | Styrene | 100-42-5 | ND | 0.1 | ug/l | 1 |
| 02980 | Bromoform | 75-25-2 | ND | 0.1 | ug/l | 1 |
| 02981 | Isopropylbenzene | 98-82-8 | ND | 0.1 | ug/l | 1 |
| 02982 | 1,1,2,2-Tetrachloroethane | 79-34-5 | ND | 0.1 | ug/l | 1 |
| 02983 | Bromobenzene | 108-86-1 | ND | 0.1 | ug/l | 1 |
| 02984 | 1,2,3-Trichloropropane | 96-18-4 | ND | 0.3 | ug/l | 1 |
| 02986 | n-Propylbenzene | 103-65-1 | ND | 0.1 | ug/l | 1 |
| 02987 | 2-Chlorotoluene | 95-49-8 | ND | 0.1 | ug/l | 1 |
| 02988 | 1,3,5-Trimethylbenzene | 108-67-8 | ND | 0.1 | ug/l | 1 |
| 02989 | 4-Chlorotoluene | 106-43-4 | ND | 0.1 | ug/l | 1 |
| 02990 | tert-Butylbenzene | 98-06-6 | ND | 0.1 | ug/l | 1 |
| 02992 | 1,2,4-Trimethylbenzene | 95-63-6 | ND | 0.1 | ug/l | 1 |
| 02993 | sec-Butylbenzene | 135-98-8 | ND | 0.1 | ug/l | 1 |
| 02994 | p-Isopropyltoluene | 99-87-6 | ND | 0.1 | ug/l | 1 |
| 02995 | 1,3-Dichlorobenzene | 541-73-1 | ND | 0.1 | ug/l | 1 |
| 02996 | 1,4-Dichlorobenzene | 106-46-7 | ND | 0.1 | ug/l | 1 |
| 02997 | n-Butylbenzene | 104-51-8 | ND | 0.1 | ug/l | 1 |
| 02998 | 1,2-Dichlorobenzene | 95-50-1 | ND | 0.1 | ug/l | 1 |
| 02999 | 1,2-Dibromo-3-chloropropane | 96-12-8 | ND | 0.5 | ug/l | 1 |
| 04857 | 1,2,4-Trichlorobenzene | 120-82-1 | ND | 0.1 | ug/l | 1 |
| 05213 | Hexachlorobutadiene | 87-68-3 | ND | 0.1 | ug/l | 1 |
| 05214 | Naphthalene | 91-20-3 | ND | 0.1 | ug/l | 1 |
| 05246 | 1,2,3-Trichlorobenzene | 87-61-6 | ND | 0.1 | ug/l | 1 |
| 02900 | EPA SW846/8260 (water-25ml) #3 | | | | | |
| 05308 | Xylene (Total) | 1330-20-7 | ND | 0.1 | ug/l | 1 |

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Chronicle

Lancaster Laboratories

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# Analysis Report



**Lancaster Laboratories Sample No. WW5449438** **Group No. 1106844**

**MW-8 Grab Water Sample**

Collected:08/21/2008 16:09 by OW

Account Number: 06735

Submitted: 08/23/2008 10:00
Reported: 09/04/2008 at 16:42
Discard: 09/12/2008

ERM-West, Inc.
1777 Botelho Drive
Suite 260
Walnut Creek CA 94596

06-08 SDG#: PLY06-01

| CAT No. | Analysis Name | Method | Trial# | Analysis Date and Time | Analyst | Dilution Factor |
|---|---|---|---|---|---|---|
| 02898 | EPA SW846/8260 (water-25ml) #1 | SW-846 8260B 25mL purge | 1 | 08/28/2008 14:15 | Angela D Sneeringer | 1 |
| 02900 | EPA SW846/8260 (water-25ml) #3 | SW-846 8260B 25mL purge | 1 | 08/28/2008 14:15 | Angela D Sneeringer | 1 |
| 01163 | GC/MS VOA Water Prep | SW-846 5030B | 1 | 08/28/2008 14:15 | Angela D Sneeringer | 1 |

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# Analysis Report



**Lancaster Laboratories Sample No. WW5449439 Group No. 1106844**

**MW-9 Grab Water Sample**

Collected:08/21/2008 17:40 by OW

Account Number: 06735

Submitted: 08/23/2008 10:00
Reported: 09/04/2008 at 16:42
Discard: 09/12/2008

ERM-West, Inc.
1777 Botelho Drive
Suite 260
Walnut Creek CA 94596

06-09 SDG#: PLY06-02

| CAT No. | Analysis Name | CAS Number | As Received Result | | As Received Method Detection Limit | Units | Dilution Factor |
|---|---|---|---|---|---|---|---|
| 02898 | EPA SW846/8260 (water-25ml) #1 | | | | | | |
| 02901 | Dichlorodifluoromethane | 75-71-8 | ND | | 0.1 | ug/l | 1 |
| 02902 | Chloromethane | 74-87-3 | ND | | 0.2 | ug/l | 1 |
| 02903 | Vinyl Chloride | 75-01-4 | ND | | 0.1 | ug/l | 1 |
| 02904 | Bromomethane | 74-83-9 | ND | | 0.1 | ug/l | 1 |
| 02905 | Chloroethane | 75-00-3 | ND | | 0.1 | ug/l | 1 |
| 02906 | Trichlorofluoromethane | 75-69-4 | ND | | 0.1 | ug/l | 1 |
| 02908 | 1,1-Dichloroethene | 75-35-4 | ND | | 0.1 | ug/l | 1 |
| 02910 | Acetone | 67-64-1 | ND | | 3.0 | ug/l | 1 |
| 02912 | Carbon Disulfide | 75-15-0 | ND | | 0.4 | ug/l | 1 |
| 02915 | Methylene Chloride | 75-09-2 | ND | | 0.2 | ug/l | 1 |
| 02918 | trans-1,2-Dichloroethene | 156-60-5 | ND | | 0.1 | ug/l | 1 |
| 02919 | Methyl Tertiary Butyl Ether | 1634-04-4 | ND | | 0.1 | ug/l | 1 |
| 02920 | n-Hexane | 110-54-3 | ND | | 0.1 | ug/l | 1 |
| 02921 | 1,1-Dichloroethane | 75-34-3 | ND | | 0.1 | ug/l | 1 |
| 02929 | 2,2-Dichloropropane | 594-20-7 | ND | | 0.1 | ug/l | 1 |
| 02930 | cis-1,2-Dichloroethene | 156-59-2 | ND | | 0.1 | ug/l | 1 |
| 02931 | 2-Butanone | 78-93-3 | ND | | 1.0 | ug/l | 1 |
| 02933 | Bromochloromethane | 74-97-5 | ND | | 0.1 | ug/l | 1 |
| 02936 | Chloroform | 67-66-3 | 0.4 | J | 0.1 | ug/l | 1 |
| 02938 | 1,1,1-Trichloroethane | 71-55-6 | ND | | 0.1 | ug/l | 1 |
| 02940 | Carbon Tetrachloride | 56-23-5 | ND | | 0.1 | ug/l | 1 |
| 02941 | 1,1-Dichloropropene | 563-58-6 | ND | | 0.1 | ug/l | 1 |
| 02942 | Benzene | 71-43-2 | ND | | 0.1 | ug/l | 1 |
| 02944 | 1,2-Dichloroethane | 107-06-2 | ND | | 0.1 | ug/l | 1 |
| 02954 | Trichloroethene | 79-01-6 | ND | | 0.1 | ug/l | 1 |
| 02956 | 1,2-Dichloropropane | 78-87-5 | ND | | 0.1 | ug/l | 1 |
| 02957 | Dibromomethane | 74-95-3 | ND | | 0.1 | ug/l | 1 |
| 02960 | Bromodichloromethane | 75-27-4 | ND | | 0.1 | ug/l | 1 |
| 02963 | cis-1,3-Dichloropropene | 10061-01-5 | ND | | 0.1 | ug/l | 1 |
| 02964 | 4-Methyl-2-Pentanone | 108-10-1 | ND | | 1.0 | ug/l | 1 |
| 02965 | Toluene | 108-88-3 | ND | | 0.1 | ug/l | 1 |
| 02966 | 1,1,2-Trichloroethane | 79-00-5 | ND | | 0.1 | ug/l | 1 |
| 02967 | trans-1,3-Dichloropropene | 10061-02-6 | ND | | 0.1 | ug/l | 1 |
| 02969 | Tetrachloroethene | 127-18-4 | 0.1 | J | 0.1 | ug/l | 1 |
| 02970 | 1,3-Dichloropropane | 142-28-9 | ND | | 0.1 | ug/l | 1 |
| 02971 | 2-Hexanone | 591-78-6 | ND | | 1.0 | ug/l | 1 |
| 02972 | Dibromochloromethane | 124-48-1 | ND | | 0.1 | ug/l | 1 |
| 02973 | 1,2-Dibromoethane | 106-93-4 | ND | | 0.1 | ug/l | 1 |

**Lancaster Laboratories Sample No. WW5449439** **Group No. 1106844**

**MW-9 Grab Water Sample**

Collected:08/21/2008 17:40 by OW

Account Number: 06735

Submitted: 08/23/2008 10:00
Reported: 09/04/2008 at 16:42
Discard: 09/12/2008

ERM-West, Inc.
1777 Botelho Drive
Suite 260
Walnut Creek CA 94596

06-09 SDG#: PLY06-02

| CAT No. | Analysis Name | CAS Number | As Received Result | As Received Method Detection Limit | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| 02974 | Chlorobenzene | 108-90-7 | ND | 0.1 | ug/l | 1 |
| 02975 | 1,1,1,2-Tetrachloroethane | 630-20-6 | ND | 0.1 | ug/l | 1 |
| 02976 | Ethylbenzene | 100-41-4 | ND | 0.1 | ug/l | 1 |
| 02977 | m+p-Xylene | 1330-20-7 | ND | 0.1 | ug/l | 1 |
| 02978 | o-Xylene | 95-47-6 | ND | 0.1 | ug/l | 1 |
| 02979 | Styrene | 100-42-5 | ND | 0.1 | ug/l | 1 |
| 02980 | Bromoform | 75-25-2 | ND | 0.1 | ug/l | 1 |
| 02981 | Isopropylbenzene | 98-82-8 | ND | 0.1 | ug/l | 1 |
| 02982 | 1,1,2,2-Tetrachloroethane | 79-34-5 | ND | 0.1 | ug/l | 1 |
| 02983 | Bromobenzene | 108-86-1 | ND | 0.1 | ug/l | 1 |
| 02984 | 1,2,3-Trichloropropane | 96-18-4 | ND | 0.3 | ug/l | 1 |
| 02986 | n-Propylbenzene | 103-65-1 | ND | 0.1 | ug/l | 1 |
| 02987 | 2-Chlorotoluene | 95-49-8 | ND | 0.1 | ug/l | 1 |
| 02988 | 1,3,5-Trimethylbenzene | 108-67-8 | ND | 0.1 | ug/l | 1 |
| 02989 | 4-Chlorotoluene | 106-43-4 | ND | 0.1 | ug/l | 1 |
| 02990 | tert-Butylbenzene | 98-06-6 | ND | 0.1 | ug/l | 1 |
| 02992 | 1,2,4-Trimethylbenzene | 95-63-6 | ND | 0.1 | ug/l | 1 |
| 02993 | sec-Butylbenzene | 135-98-8 | ND | 0.1 | ug/l | 1 |
| 02994 | p-Isopropyltoluene | 99-87-6 | ND | 0.1 | ug/l | 1 |
| 02995 | 1,3-Dichlorobenzene | 541-73-1 | ND | 0.1 | ug/l | 1 |
| 02996 | 1,4-Dichlorobenzene | 106-46-7 | ND | 0.1 | ug/l | 1 |
| 02997 | n-Butylbenzene | 104-51-8 | ND | 0.1 | ug/l | 1 |
| 02998 | 1,2-Dichlorobenzene | 95-50-1 | ND | 0.1 | ug/l | 1 |
| 02999 | 1,2-Dibromo-3-chloropropane | 96-12-8 | ND | 0.5 | ug/l | 1 |
| 04857 | 1,2,4-Trichlorobenzene | 120-82-1 | ND | 0.1 | ug/l | 1 |
| 05213 | Hexachlorobutadiene | 87-68-3 | ND | 0.1 | ug/l | 1 |
| 05214 | Naphthalene | 91-20-3 | ND | 0.1 | ug/l | 1 |
| 05246 | 1,2,3-Trichlorobenzene | 87-61-6 | ND | 0.1 | ug/l | 1 |
| 02900 | EPA SW846/8260 (water-25ml) #3 | | | | | |
| 05308 | Xylene (Total) | 1330-20-7 | ND | 0.1 | ug/l | 1 |

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Chronicle

Lancaster Laboratories

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# Analysis Report



**Lancaster Laboratories Sample No. WW5449439** **Group No. 1106844**

**MW-9 Grab Water Sample**

Collected:08/21/2008 17:40 by OW

Account Number: 06735

Submitted: 08/23/2008 10:00
Reported: 09/04/2008 at 16:42
Discard: 09/12/2008

ERM-West, Inc.
1777 Botelho Drive
Suite 260
Walnut Creek CA 94596

06-09 SDG#: PLY06-02

| CAT No. | Analysis Name | Method | Trial# | Analysis Date and Time | Analyst | Dilution Factor |
|---|---|---|---|---|---|---|
| 02898 | EPA SW846/8260 (water-25ml) #1 | SW-846 8260B 25mL purge | 1 | 08/28/2008 14:37 | Angela D Sneeringer | 1 |
| 02900 | EPA SW846/8260 (water-25ml) #3 | SW-846 8260B 25mL purge | 1 | 08/28/2008 14:37 | Angela D Sneeringer | 1 |
| 01163 | GC/MS VOA Water Prep | SW-846 5030B | 1 | 08/28/2008 14:37 | Angela D Sneeringer | 1 |

Lancaster Laboratories

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# Analysis Report



**Lancaster Laboratories Sample No. WW5449440** **Group No. 1106844**

**Trip Blank Water Sample**

Collected:08/21/2008 17:50

Submitted: 08/23/2008 10:00
Reported: 09/04/2008 at 16:42
Discard: 09/12/2008

06-TB SDG#: PLY06-03*

Account Number: 06735

ERM-West, Inc.
1777 Botelho Drive
Suite 260
Walnut Creek CA 94596

| CAT No. | Analysis Name | CAS Number | As Received Result | As Received Method Detection Limit | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| 02898 | EPA SW846/8260 (water-25ml) #1 | | | | | |
| 02901 | Dichlorodifluoromethane | 75-71-8 | ND | 0.1 | ug/l | 1 |
| 02902 | Chloromethane | 74-87-3 | ND | 0.2 | ug/l | 1 |
| 02903 | Vinyl Chloride | 75-01-4 | ND | 0.1 | ug/l | 1 |
| 02904 | Bromomethane | 74-83-9 | ND | 0.1 | ug/l | 1 |
| 02905 | Chloroethane | 75-00-3 | ND | 0.1 | ug/l | 1 |
| 02906 | Trichlorofluoromethane | 75-69-4 | ND | 0.1 | ug/l | 1 |
| 02908 | 1,1-Dichloroethene | 75-35-4 | ND | 0.1 | ug/l | 1 |
| 02910 | Acetone | 67-64-1 | ND | 3.0 | ug/l | 1 |
| 02912 | Carbon Disulfide | 75-15-0 | ND | 0.4 | ug/l | 1 |
| 02915 | Methylene Chloride | 75-09-2 | ND | 0.2 | ug/l | 1 |
| 02918 | trans-1,2-Dichloroethene | 156-60-5 | ND | 0.1 | ug/l | 1 |
| 02919 | Methyl Tertiary Butyl Ether | 1634-04-4 | ND | 0.1 | ug/l | 1 |
| 02920 | n-Hexane | 110-54-3 | ND | 0.1 | ug/l | 1 |
| 02921 | 1,1-Dichloroethane | 75-34-3 | ND | 0.1 | ug/l | 1 |
| 02929 | 2,2-Dichloropropane | 594-20-7 | ND | 0.1 | ug/l | 1 |
| 02930 | cis-1,2-Dichloroethene | 156-59-2 | ND | 0.1 | ug/l | 1 |
| 02931 | 2-Butanone | 78-93-3 | ND | 1.0 | ug/l | 1 |
| 02933 | Bromochloromethane | 74-97-5 | ND | 0.1 | ug/l | 1 |
| 02936 | Chloroform | 67-66-3 | ND | 0.1 | ug/l | 1 |
| 02938 | 1,1,1-Trichloroethane | 71-55-6 | ND | 0.1 | ug/l | 1 |
| 02940 | Carbon Tetrachloride | 56-23-5 | ND | 0.1 | ug/l | 1 |
| 02941 | 1,1-Dichloropropene | 563-58-6 | ND | 0.1 | ug/l | 1 |
| 02942 | Benzene | 71-43-2 | ND | 0.1 | ug/l | 1 |
| 02944 | 1,2-Dichloroethane | 107-06-2 | ND | 0.1 | ug/l | 1 |
| 02954 | Trichloroethene | 79-01-6 | ND | 0.1 | ug/l | 1 |
| 02956 | 1,2-Dichloropropane | 78-87-5 | ND | 0.1 | ug/l | 1 |
| 02957 | Dibromomethane | 74-95-3 | ND | 0.1 | ug/l | 1 |
| 02960 | Bromodichloromethane | 75-27-4 | ND | 0.1 | ug/l | 1 |
| 02963 | cis-1,3-Dichloropropene | 10061-01-5 | ND | 0.1 | ug/l | 1 |
| 02964 | 4-Methyl-2-Pentanone | 108-10-1 | ND | 1.0 | ug/l | 1 |
| 02965 | Toluene | 108-88-3 | ND | 0.1 | ug/l | 1 |
| 02966 | 1,1,2-Trichloroethane | 79-00-5 | ND | 0.1 | ug/l | 1 |
| 02967 | trans-1,3-Dichloropropene | 10061-02-6 | ND | 0.1 | ug/l | 1 |
| 02969 | Tetrachloroethene | 127-18-4 | ND | 0.1 | ug/l | 1 |
| 02970 | 1,3-Dichloropropane | 142-28-9 | ND | 0.1 | ug/l | 1 |
| 02971 | 2-Hexanone | 591-78-6 | ND | 1.0 | ug/l | 1 |
| 02972 | Dibromochloromethane | 124-48-1 | ND | 0.1 | ug/l | 1 |
| 02973 | 1,2-Dibromoethane | 106-93-4 | ND | 0.1 | ug/l | 1 |

**Lancaster Laboratories Sample No. WW5449440** **Group No. 1106844**

**Trip Blank Water Sample**

Collected:08/21/2008 17:50

Submitted: 08/23/2008 10:00
Reported: 09/04/2008 at 16:42
Discard: 09/12/2008

06-TB SDG#: PLY06-03*

Account Number: 06735

ERM-West, Inc.
1777 Botelho Drive
Suite 260
Walnut Creek CA 94596

| CAT No. | Analysis Name | CAS Number | As Received Result | As Received Method Detection Limit | Units | Dilution Factor |
|---|---|---|---|---|---|---|
| 02974 | Chlorobenzene | 108-90-7 | ND | 0.1 | ug/l | 1 |
| 02975 | 1,1,1,2-Tetrachloroethane | 630-20-6 | ND | 0.1 | ug/l | 1 |
| 02976 | Ethylbenzene | 100-41-4 | ND | 0.1 | ug/l | 1 |
| 02977 | m+p-Xylene | 1330-20-7 | ND | 0.1 | ug/l | 1 |
| 02978 | o-Xylene | 95-47-6 | ND | 0.1 | ug/l | 1 |
| 02979 | Styrene | 100-42-5 | ND | 0.1 | ug/l | 1 |
| 02980 | Bromoform | 75-25-2 | ND | 0.1 | ug/l | 1 |
| 02981 | Isopropylbenzene | 98-82-8 | ND | 0.1 | ug/l | 1 |
| 02982 | 1,1,2,2-Tetrachloroethane | 79-34-5 | ND | 0.1 | ug/l | 1 |
| 02983 | Bromobenzene | 108-86-1 | ND | 0.1 | ug/l | 1 |
| 02984 | 1,2,3-Trichloropropane | 96-18-4 | ND | 0.3 | ug/l | 1 |
| 02986 | n-Propylbenzene | 103-65-1 | ND | 0.1 | ug/l | 1 |
| 02987 | 2-Chlorotoluene | 95-49-8 | ND | 0.1 | ug/l | 1 |
| 02988 | 1,3,5-Trimethylbenzene | 108-67-8 | ND | 0.1 | ug/l | 1 |
| 02989 | 4-Chlorotoluene | 106-43-4 | ND | 0.1 | ug/l | 1 |
| 02990 | tert-Butylbenzene | 98-06-6 | ND | 0.1 | ug/l | 1 |
| 02992 | 1,2,4-Trimethylbenzene | 95-63-6 | ND | 0.1 | ug/l | 1 |
| 02993 | sec-Butylbenzene | 135-98-8 | ND | 0.1 | ug/l | 1 |
| 02994 | p-Isopropyltoluene | 99-87-6 | ND | 0.1 | ug/l | 1 |
| 02995 | 1,3-Dichlorobenzene | 541-73-1 | ND | 0.1 | ug/l | 1 |
| 02996 | 1,4-Dichlorobenzene | 106-46-7 | ND | 0.1 | ug/l | 1 |
| 02997 | n-Butylbenzene | 104-51-8 | ND | 0.1 | ug/l | 1 |
| 02998 | 1,2-Dichlorobenzene | 95-50-1 | ND | 0.1 | ug/l | 1 |
| 02999 | 1,2-Dibromo-3-chloropropane | 96-12-8 | ND | 0.5 | ug/l | 1 |
| 04857 | 1,2,4-Trichlorobenzene | 120-82-1 | ND | 0.1 | ug/l | 1 |
| 05213 | Hexachlorobutadiene | 87-68-3 | ND | 0.1 | ug/l | 1 |
| 05214 | Naphthalene | 91-20-3 | ND | 0.1 | ug/l | 1 |
| 05246 | 1,2,3-Trichlorobenzene | 87-61-6 | ND | 0.1 | ug/l | 1 |
| 02900 | EPA SW846/8260 (water-25ml) #3 | | | | | |
| 05308 | Xylene (Total) | 1330-20-7 | ND | 0.1 | ug/l | 1 |

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Chronicle

Lancaster Laboratories

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

# Analysis Report



**Lancaster Laboratories Sample No. WW5449440** **Group No. 1106844**

**Trip Blank Water Sample**

Collected:08/21/2008 17:50

Submitted: 08/23/2008 10:00
Reported: 09/04/2008 at 16:42
Discard: 09/12/2008

Account Number: 06735

ERM-West, Inc.
1777 Botelho Drive
Suite 260
Walnut Creek CA 94596

06-TB SDG#: PLY06-03*

| CAT No. | Analysis Name | Method | Trial# | Analysis Date and Time | Analyst | Dilution Factor |
|---|---|---|---|---|---|---|
| 02898 | EPA SW846/8260 (water-25ml) #1 | SW-846 8260B 25mL purge | 1 | 08/28/2008 14:58 | Angela D Sneeringer | 1 |
| 02900 | EPA SW846/8260 (water-25ml) #3 | SW-846 8260B 25mL purge | 1 | 08/28/2008 14:58 | Angela D Sneeringer | 1 |
| 01163 | GC/MS VOA Water Prep | SW-846 5030B | 1 | 08/28/2008 14:58 | Angela D Sneeringer | 1 |

## Quality Control Summary

Client Name: ERM-West, Inc. Group Number: 1106844
Reported: 09/04/08 at 04:42 PM

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

## Laboratory Compliance Quality Control

| Analysis Name | Blank Result | Blank MDL | Report Units | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD | RPD Max |
|---|---|---|---|---|---|---|---|---|
| Batch number: C082411AA | Sample number(s): 5449438-5449440 | | | | | | | |
| Dichlorodifluoromethane | ND | 0.1 | ug/l | 57 | 60 | 47-160 | 6 | 30 |
| Chloromethane | ND | 0.2 | ug/l | 73 | 81 | 64-136 | 11 | 30 |
| Vinyl Chloride | ND | 0.1 | ug/l | 77 | 84 | 63-133 | 8 | 30 |
| Bromomethane | ND | 0.1 | ug/l | 81 | 88 | 74-124 | 8 | 30 |
| Chloroethane | ND | 0.1 | ug/l | 84 | 88 | 71-125 | 5 | 30 |
| Trichlorofluoromethane | ND | 0.1 | ug/l | 86 | 87 | 63-151 | 1 | 30 |
| 1,1-Dichloroethene | ND | 0.1 | ug/l | 94 | 96 | 86-124 | 2 | 30 |
| Acetone | ND | 3.0 | ug/l | 109 | 105 | 73-133 | 4 | 30 |
| Carbon Disulfide | ND | 0.4 | ug/l | 94 | 97 | 67-137 | 3 | 30 |
| Methylene Chloride | ND | 0.2 | ug/l | 100 | 99 | 83-111 | 2 | 30 |
| trans-1,2-Dichloroethene | ND | 0.1 | ug/l | 95 | 96 | 86-111 | 1 | 30 |
| Methyl Tertiary Butyl Ether | ND | 0.1 | ug/l | 91 | 92 | 77-115 | 2 | 30 |
| n-Hexane | ND | 0.1 | ug/l | 100 | 102 | 73-121 | 2 | 30 |
| 1,1-Dichloroethane | ND | 0.1 | ug/l | 100 | 102 | 84-116 | 2 | 30 |
| 2,2-Dichloropropane | ND | 0.1 | ug/l | 102 | 102 | 75-130 | 0 | 30 |
| cis-1,2-Dichloroethene | ND | 0.1 | ug/l | 96 | 97 | 86-113 | 2 | 30 |
| 2-Butanone | ND | 1.0 | ug/l | 111 | 106 | 70-145 | 5 | 30 |
| Bromochloromethane | ND | 0.1 | ug/l | 92 | 91 | 83-115 | 1 | 30 |
| Chloroform | ND | 0.1 | ug/l | 101 | 100 | 83-121 | 1 | 30 |
| 1,1,1-Trichloroethane | ND | 0.1 | ug/l | 100 | 100 | 79-131 | 0 | 30 |
| Carbon Tetrachloride | ND | 0.1 | ug/l | 101 | 102 | 73-143 | 0 | 30 |
| 1,1-Dichloropropene | ND | 0.1 | ug/l | 100 | 101 | 87-114 | 0 | 30 |
| Benzene | ND | 0.1 | ug/l | 97 | 97 | 87-111 | 1 | 30 |
| 1,2-Dichloroethane | ND | 0.1 | ug/l | 105 | 105 | 78-137 | 0 | 30 |
| Trichloroethene | ND | 0.1 | ug/l | 96 | 97 | 87-116 | 1 | 30 |
| 1,2-Dichloropropane | ND | 0.1 | ug/l | 98 | 98 | 85-115 | 0 | 30 |
| Dibromomethane | ND | 0.1 | ug/l | 98 | 96 | 90-116 | 2 | 30 |
| Bromodichloromethane | ND | 0.1 | ug/l | 100 | 99 | 85-123 | 1 | 30 |
| cis-1,3-Dichloropropene | ND | 0.1 | ug/l | 92 | 93 | 72-115 | 1 | 30 |
| 4-Methyl-2-Pentanone | ND | 1.0 | ug/l | 100 | 100 | 71-130 | 0 | 30 |
| Toluene | ND | 0.1 | ug/l | 96 | 96 | 89-113 | 1 | 30 |
| 1,1,2-Trichloroethane | ND | 0.1 | ug/l | 96 | 95 | 87-115 | 1 | 30 |
| trans-1,3-Dichloropropene | ND | 0.1 | ug/l | 98 | 98 | 77-122 | 0 | 30 |
| Tetrachloroethene | ND | 0.1 | ug/l | 94 | 94 | 81-116 | 0 | 30 |
| 1,3-Dichloropropane | ND | 0.1 | ug/l | 99 | 100 | 88-114 | 1 | 30 |
| 2-Hexanone | ND | 1.0 | ug/l | 104 | 104 | 69-135 | 1 | 30 |
| Dibromochloromethane | ND | 0.1 | ug/l | 95 | 94 | 84-127 | 1 | 30 |
| 1,2-Dibromoethane | ND | 0.1 | ug/l | 94 | 93 | 86-116 | 1 | 30 |
| Chlorobenzene | ND | 0.1 | ug/l | 93 | 94 | 88-112 | 1 | 30 |
| 1,1,1,2-Tetrachloroethane | ND | 0.1 | ug/l | 95 | 96 | 86-119 | 1 | 30 |
| Ethylbenzene | ND | 0.1 | ug/l | 98 | 98 | 88-114 | 0 | 30 |
| m+p-Xylene | ND | 0.1 | ug/l | 96 | 96 | 88-115 | 0 | 30 |
| o-Xylene | ND | 0.1 | ug/l | 95 | 96 | 88-115 | 1 | 30 |
| Styrene | ND | 0.1 | ug/l | 98 | 98 | 87-111 | 0 | 30 |
| Bromoform | ND | 0.1 | ug/l | 91 | 91 | 66-131 | 0 | 30 |
| Isopropylbenzene | ND | 0.1 | ug/l | 95 | 96 | 87-115 | 2 | 30 |

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: ERM-West, Inc. Group Number: 1106844
Reported: 09/04/08 at 04:42 PM

### Laboratory Compliance Quality Control

| Analysis Name | Blank Result | Blank MDL | Report Units | LCS %REC | LCSD %REC | LCS/LCSD Limits | RPD | RPD Max |
|---|---|---|---|---|---|---|---|---|
| 1,1,2,2-Tetrachloroethane | ND | 0.1 | ug/l | 93 | 95 | 83-119 | 1 | 30 |
| Bromobenzene | ND | 0.1 | ug/l | 90 | 90 | 84-112 | 0 | 30 |
| 1,2,3-Trichloropropane | ND | 0.3 | ug/l | 94 | 92 | 80-120 | 2 | 30 |
| n-Propylbenzene | ND | 0.1 | ug/l | 99 | 100 | 88-116 | 1 | 30 |
| 2-Chlorotoluene | ND | 0.1 | ug/l | 93 | 94 | 90-112 | 2 | 30 |
| 1,3,5-Trimethylbenzene | ND | 0.1 | ug/l | 96 | 96 | 86-113 | 1 | 30 |
| 4-Chlorotoluene | ND | 0.1 | ug/l | 93 | 93 | 90-113 | 1 | 30 |
| tert-Butylbenzene | ND | 0.1 | ug/l | 93 | 95 | 90-114 | 2 | 30 |
| 1,2,4-Trimethylbenzene | ND | 0.1 | ug/l | 96 | 97 | 86-114 | 1 | 30 |
| sec-Butylbenzene | ND | 0.1 | ug/l | 97 | 98 | 83-115 | 1 | 30 |
| p-Isopropyltoluene | ND | 0.1 | ug/l | 95 | 95 | 85-115 | 0 | 30 |
| 1,3-Dichlorobenzene | ND | 0.1 | ug/l | 91 | 91 | 85-109 | 1 | 30 |
| 1,4-Dichlorobenzene | ND | 0.1 | ug/l | 90 | 91 | 85-112 | 1 | 30 |
| n-Butylbenzene | ND | 0.1 | ug/l | 99 | 100 | 84-116 | 2 | 30 |
| 1,2-Dichlorobenzene | ND | 0.1 | ug/l | 92 | 92 | 89-114 | 0 | 30 |
| 1,2-Dibromo-3-chloropropane | ND | 0.5 | ug/l | 94 | 91 | 65-129 | 3 | 30 |
| 1,2,4-Trichlorobenzene | ND | 0.1 | ug/l | 83 | 84 | 71-115 | 1 | 30 |
| Hexachlorobutadiene | ND | 0.1 | ug/l | 87 | 88 | 74-117 | 1 | 30 |
| Naphthalene | ND | 0.1 | ug/l | 84 | 84 | 69-123 | 1 | 30 |
| 1,2,3-Trichlorobenzene | ND | 0.1 | ug/l | 84 | 86 | 76-117 | 2 | 30 |
| Xylene (Total) | ND | 0.1 | ug/l | 96 | 96 | 88-115 | 0 | 30 |

### Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

| Analysis Name | MS %REC | MSD %REC | MS/MSD Limits | RPD | RPD MAX | BKG Conc | DUP Conc | DUP RPD | Dup RPD Max |
|---|---|---|---|---|---|---|---|---|---|
| Batch number: C082411AA | Sample number(s): 5449438-5449440 UNSPK: P447849 | | | | | | | | |
| Dichlorodifluoromethane | 68 | | 44-195 | | | | | | |
| Chloromethane | 82 | | 66-158 | | | | | | |
| Vinyl Chloride | 84 | | 72-155 | | | | | | |
| Bromomethane | 85 | | 73-139 | | | | | | |
| Chloroethane | 86 | | 75-142 | | | | | | |
| Trichlorofluoromethane | 94 | | 68-173 | | | | | | |
| 1,1-Dichloroethene | 102 | | 90-144 | | | | | | |
| Acetone | 96 | | 52-165 | | | | | | |
| Carbon Disulfide | 106 | | 76-170 | | | | | | |
| Methylene Chloride | 98 | | 87-118 | | | | | | |
| trans-1,2-Dichloroethene | 100 | | 86-135 | | | | | | |
| Methyl Tertiary Butyl Ether | 89 | | 75-128 | | | | | | |
| n-Hexane | 115 | | 78-155 | | | | | | |
| 1,1-Dichloroethane | 100 | | 92-130 | | | | | | |
| 2,2-Dichloropropane | 99 | | 79-142 | | | | | | |
| cis-1,2-Dichloroethene | 105 | | 78-136 | | | | | | |
| 2-Butanone | 98 | | 54-168 | | | | | | |
| Bromochloromethane | 96 | | 85-127 | | | | | | |
| Chloroform | 96 | | 85-137 | | | | | | |
| 1,1,1-Trichloroethane | 98 | | 81-155 | | | | | | |
| Carbon Tetrachloride | 100 | | 85-157 | | | | | | |
| 1,1-Dichloropropene | 103 | | 86-128 | | | | | | |

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

# Quality Control Summary

Client Name: ERM-West, Inc. Group Number: 1106844
Reported: 09/04/08 at 04:42 PM

## Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

| Analysis Name | MS %REC | MSD %REC | MS/MSD Limits | RPD | RPD MAX | BKG Conc | DUP Conc | DUP RPD | Dup RPD Max |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | 98 | | 85-126 | | | | | | |
| 1,2-Dichloroethane | 97 | | 79-147 | | | | | | |
| Trichloroethene | 98 | | 80-139 | | | | | | |
| 1,2-Dichloropropane | 100 | | 86-126 | | | | | | |
| Dibromomethane | 93 | | 90-122 | | | | | | |
| Bromodichloromethane | 90 | | 86-139 | | | | | | |
| cis-1,3-Dichloropropene | 85 | | 67-126 | | | | | | |
| 4-Methyl-2-Pentanone | 95 | | 61-145 | | | | | | |
| Toluene | 95 | | 87-128 | | | | | | |
| 1,1,2-Trichloroethane | 97 | | 75-143 | | | | | | |
| trans-1,3-Dichloropropene | 85 | | 71-129 | | | | | | |
| Tetrachloroethene | 95 | | 82-131 | | | | | | |
| 1,3-Dichloropropane | 94 | | 82-126 | | | | | | |
| 2-Hexanone | 99 | | 58-146 | | | | | | |
| Dibromochloromethane | 80 | | 80-146 | | | | | | |
| 1,2-Dibromoethane | 90 | | 84-122 | | | | | | |
| Chlorobenzene | 94 | | 88-126 | | | | | | |
| 1,1,1,2-Tetrachloroethane | 92 | | 88-131 | | | | | | |
| Ethylbenzene | 95 | | 89-129 | | | | | | |
| m+p-Xylene | 92 | | 84-132 | | | | | | |
| o-Xylene | 92 | | 86-129 | | | | | | |
| Styrene | 79 | | 17-156 | | | | | | |
| Bromoform | 67 | | 62-141 | | | | | | |
| Isopropylbenzene | 97 | | 93-128 | | | | | | |
| 1,1,2,2-Tetrachloroethane | 97 | | 77-131 | | | | | | |
| Bromobenzene | 91 | | 88-114 | | | | | | |
| 1,2,3-Trichloropropane | 92 | | 75-128 | | | | | | |
| n-Propylbenzene | 102 | | 86-128 | | | | | | |
| 2-Chlorotoluene | 96 | | 88-119 | | | | | | |
| 1,3,5-Trimethylbenzene | 87 | | 74-130 | | | | | | |
| 4-Chlorotoluene | 97 | | 89-125 | | | | | | |
| tert-Butylbenzene | 99 | | 88-129 | | | | | | |
| 1,2,4-Trimethylbenzene | 88 | | 64-140 | | | | | | |
| sec-Butylbenzene | 102 | | 89-136 | | | | | | |
| p-Isopropyltoluene | 96 | | 81-132 | | | | | | |
| 1,3-Dichlorobenzene | 93 | | 89-123 | | | | | | |
| 1,4-Dichlorobenzene | 93 | | 87-123 | | | | | | |
| n-Butylbenzene | 100 | | 84-139 | | | | | | |
| 1,2-Dichlorobenzene | 91 | | 83-123 | | | | | | |
| 1,2-Dibromo-3-chloropropane | 87 | | 43-183 | | | | | | |
| 1,2,4-Trichlorobenzene | 83 | | 71-131 | | | | | | |
| Hexachlorobutadiene | 88 | | 63-147 | | | | | | |
| Naphthalene | 83 | | 54-142 | | | | | | |
| 1,2,3-Trichlorobenzene | 81 | | 70-134 | | | | | | |
| Xylene (Total) | 92 | | 84-131 | | | | | | |

## Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

# Quality Control Summary

Client Name: ERM-West, Inc. Group Number: 1106844
Reported: 09/04/08 at 04:42 PM

## Surrogate Quality Control

Analysis Name: EPA SW846/8260 (water-25ml) #1
Batch number: C082411AA

| | Dibromofluoromethane | 1,2-Dichloroethane-d4 | Toluene-d8 | 4-Bromofluorobenzene |
|---|---|---|---|---|
| 5449438 | 90 | 91 | 96 | 88 |
| 5449439 | 91 | 91 | 93 | 88 |
| 5449440 | 91 | 91 | 99 | 89 |
| Blank | 97 | 92 | 99 | 91 |
| LCS | 96 | 95 | 101 | 99 |
| LCSD | 96 | 95 | 101 | 101 |
| MS | 94 | 91 | 98 | 94 |
| Limits: | 77-114 | 74-113 | 77-110 | 78-110 |

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

# Analysis Request/ Environmental Services Chain of Custody

Lancaster Laboratories

For Lancaster Laboratories use only

Acct. # 6735 Group# 1106844 Sample # 5449438-40

**COC # 189779**

Please print. Instructions on reverse side correspond with circled numbers.

(1) Client: ERM Acct. #:

Project Name/#: Normandy Park/75720 PWSID #:

Project Manager: Mike Arnold P.O.#:

Sampler: Olivia Williams (425) 462-8591 Quote #:

Name of state where samples were collected: NA

For Lab Use Only
FSC:
SCR#: 163824

| (2) Sample Identification | Date Collected | Time Collected | (3) Grab | Composite | Matrix: Soil | Water | Other | (4) Total # of Containers | (5) Analyses Requested: Preservation Codes H | VOCs - 8260 | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-8 | 8/21/08 | 1609 | X | | | X | | 4 | X | | |
| MW-9 | 8/21/08 | 1740 | X | | | X | | 4 | X | | |
| Trip Blank | 8/21/08 | 1750 | X | | | X | | 2 | X | | |

Preservation Codes
H=HCl T=Thiosulfate
N=$HNO_3$ B=NaOH
S=$H_2SO_4$ O=Other

(6) Temperature of samples upon receipt (if requested)

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush
(Rush TAT is subject to Lancaster Laboratories approval and surcharge.)
Date results are needed:
Rush results requested by (please circle): Phone Fax E-mail
Phone #: Fax #:
E-mail address: mike.arnold@erm.com

(8) **Data Package Options** (please circle if required)
Type I (validation/NJ Reg)
Type II (Tier II)
Type III (Reduced NJ)
Type IV (CLP SOW)
Type VI (Raw Data Only)
TX TRRP-13
MA MCP CT RCP
SDG Complete? Yes No
Site-specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate volume.)
Internal COC Required? Yes / No

| Relinquished by: | Date | Time | Received by: | Date | Time |
|---|---|---|---|---|---|
| | 8/21/08 | 1550 | | 8/15/08 | AM |
| Relinquished by: | Date | Time | Received by: | Date | Time |
| | 8/22/08 | 1115 | | | |
| Relinquished by: | Date | Time | Received by: | Date | Time |
| Relinquished by: | Date | Time | Received by: | Date | Time |
| Relinquished by: | Date | Time | Received by: | Date | Time |
| | | | | 8/23/08 | 1000 |

(9)

Lancaster Laboratories, Inc., 2425 New Holland Pike, Lancaster, PA 17601 (717) 656-2300 Fax: (717) 656-6766

Copies: White and yellow should accompany samples to Lancaster Laboratories. The pink copy should be retained by the client.

2102.03

# Lancaster Laboratories
# Explanation of Symbols and Abbreviations

*The following defines common symbols and abbreviations used in reporting technical data:*

| | | | |
|---|---|---|---|
| **N.D.** | none detected | **BMQL** | Below Minimum Quantitation Level |
| **TNTC** | Too Numerous To Count | **MPN** | Most Probable Number |
| **IU** | International Units | **CP Units** | cobalt-chloroplatinate units |
| **umhos/cm** | micromhos/cm | **NTU** | nephelometric turbidity units |
| **C** | degrees Celsius | **F** | degrees Fahrenheit |
| **Cal** | (diet) calories | **lb.** | pound(s) |
| **meq** | milliequivalents | **kg** | kilogram(s) |
| **g** | gram(s) | **mg** | milligram(s) |
| **ug** | microgram(s) | **l** | liter(s) |
| **ml** | milliliter(s) | **ul** | microliter(s) |
| **m3** | cubic meter(s) | **fib >5 um/ml** | fibers greater than 5 microns in length per ml |

**<** less than – The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

**>** greater than

**ppm** parts per million – One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

**ppb** parts per billion

**Dry weight basis** Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture.

*U.S. EPA data qualifiers:*

**Organic Qualifiers**

| | |
|---|---|
| **A** | TIC is a possible aldol-condensation product |
| **B** | Analyte was also detected in the blank |
| **C** | Pesticide result confirmed by GC/MS |
| **D** | Compound quatitated on a diluted sample |
| **E** | Concentration exceeds the calibration range of the instrument |
| **J** | Estimated value |
| **N** | Presumptive evidence of a compound (TICs only) |
| **P** | Concentration difference between primary and confirmation columns >25% |
| **U** | Compound was not detected |
| **X,Y,Z** | Defined in case narrative |

**Inorganic Qualifiers**

| | |
|---|---|
| **B** | Value is <CRDL, but ≥IDL |
| **E** | Estimated due to interference |
| **M** | Duplicate injection precision not met |
| **N** | Spike amount not within control limits |
| **S** | Method of standard additions (MSA) used for calculation |
| **U** | Compound was not detected |
| **W** | Post digestion spike out of control limits |
| ***** | Duplicate analysis not within control limits |
| **+** | Correlation coefficient for MSA <0.995 |

Analytical test results for methods listed on the laboratories' accreditation scope meet all requirements of NELAC unless otherwise noted under the individual analysis.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

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June 06, 2008

# LABORATORY REPORT

Client:
ERM - Bellevue
915 118th Avenue SE Suite 130
Bellevue, WA 98005
Attn: Mike Arnold

Work Order: LRE0179
Project Name: Normandy Park
Project Number: [none]
Date Received: 05/21/08

*The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica.*

*TestAmerica Laboratories, Inc. certifies that the analytical results contained herein apply only to the specific sample(s) analyzed.*

*The Chain of Custody, 1 page, is included and is an integral part of this report. This entire report was reviewed and approved for release.*

If you have any questions relating to this analytical report, please contact your Laboratory Project Manager at 714-258-8610.

Analyses included in this report were performed by the laboratory shown at the top of this report unless otherwise indicated.

Approved By:

Beth Riley

Beth Riley
Project Manager

NELAP Certification # E87652

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ERM - Bellevue
915 118th Avenue SE Suite 130
Bellevue, WA 98005
Mike Arnold

Work Order: LRE0179
Project: Normandy Park
Project Number: [none]

Received: 05/21/08 09:45
Reported: 06/06/08 10:10

| SAMPLE IDENTIFICATION | LAB NUMBER | COLLECTION | MATRIX | CONTAINER TYPE |
|---|---|---|---|---|
| NP-BASEMENT | LRE0179-01 | 05/20/08 13:30 | Air | Passivated Canister |
| NP-MAIN FLOOR | LRE0179-02 | 05/20/08 13:35 | Air | Passivated Canister |
| NP-OUTDOOR | LRE0179-03 | 05/20/08 13:45 | Air | Passivated Canister |

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Bellevue, WA 98005
Mike Arnold

Work Order: LRE0179
Project: Normandy Park
Project Number: [none]

Received: 05/21/08 09:45
Reported: 06/06/08 10:10

## ANALYTICAL REPORT

**Sample ID: LRE0179-01 (NP-BASEMENT - Air)** **Sampled: 05/20/08 13:30**

**EPA TO15 - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Data Qualifiers | Units | MDL | RL | Dilution | Date Analyzed | Instrument | Analyst | QC Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon tetrachloride | ND | | ppbv | 0.15 | 0.30 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| Chloroform | ND | | ppbv | 0.15 | 0.30 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| 1,1-Dichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| 1,2-Dichloroethane | ND | | ppbv | 0.10 | 0.20 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| **1,1-Dichloroethene** | **0.12** | J | ppbv | 0.10 | 0.20 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| 1,2-Dichloropropane | ND | | ppbv | 0.080 | 0.20 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| 1,2-Dichloro-1,1,2,2-tetrafluoroethane | ND | | ppbv | 0.090 | 0.20 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| Methylene chloride | ND | | ppbv | 0.15 | 0.30 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| 1,1,2,2-Tetrachloroethane | ND | | ppbv | 0.15 | 0.30 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| Tetrachloroethene | ND | | ppbv | 0.20 | 0.40 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| 1,1,1-Trichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| 1,1,2-Trichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| Trichloroethene | ND | | ppbv | 0.20 | 0.40 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| Trichlorofluoromethane | ND | | ppbv | 0.20 | 0.40 | 1.0 | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| *Surr: 4-Bromofluorobenzene (70-130%)* | *98 %* | | | | | | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| *Surr: 1,2-Dichloroethane-d4 (70-130%)* | *98 %* | | | | | | 06/03/08 19:15 | gcmse | DLK | 8F04005 |
| *Surr: Toluene-d8 (70-130%)* | *97 %* | | | | | | 06/03/08 19:15 | gcmse | DLK | 8F04005 |

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ERM - Bellevue
915 118th Avenue SE Suite 130
Bellevue, WA 98005
Mike Arnold

Work Order: LRE0179
Project: Normandy Park
Project Number: [none]

Received: 05/21/08 09:45
Reported: 06/06/08 10:10

## ANALYTICAL REPORT

**Sample ID: LRE0179-02 (NP-MAIN FLOOR - Air)** **Sampled: 05/20/08 13:35**

**EPA TO15 - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Data Qualifiers | Units | MDL | RL | Dilution | Date Analyzed | Instrument | Analyst | QC Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon tetrachloride | ND | | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| Chloroform | ND | | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| 1,1-Dichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| 1,2-Dichloroethane | ND | | ppbv | 0.10 | 0.20 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| 1,1-Dichloroethene | ND | | ppbv | 0.10 | 0.20 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| 1,2-Dichloropropane | ND | | ppbv | 0.080 | 0.20 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| 1,2-Dichloro-1,1,2,2-tetrafluoroethane | ND | | ppbv | 0.090 | 0.20 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| **Methylene chloride** | **0.30** | J | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| 1,1,2,2-Tetrachloroethane | ND | | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| Tetrachloroethene | ND | | ppbv | 0.20 | 0.40 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| **1,1,1-Trichloroethane** | **0.91** | | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| 1,1,2-Trichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| Trichloroethene | ND | | ppbv | 0.20 | 0.40 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| **Trichlorofluoromethane** | **0.62** | | ppbv | 0.20 | 0.40 | 1.0 | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| *Surr: 4-Bromofluorobenzene (70-130%)* | *102 %* | | | | | | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| *Surr: 1,2-Dichloroethane-d4 (70-130%)* | *117 %* | | | | | | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |
| *Surr: Toluene-d8 (70-130%)* | *101 %* | | | | | | 05/31/08 18:53 | gcmsd | DLK | 8F02003 |

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Bellevue, WA 98005
Mike Arnold

Work Order: LRE0179
Project: Normandy Park
Project Number: [none]

Received: 05/21/08 09:45
Reported: 06/06/08 10:10

## ANALYTICAL REPORT

**Sample ID: LRE0179-03 (NP-OUTDOOR - Air)** **Sampled: 05/20/08 13:45**

**EPA TO15 - Volatile Organic Compounds by GC/MS**

| Analyte | Result | Data Qualifiers | Units | MDL | RL | Dilution | Date Analyzed | Instrument | Analyst | QC Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon tetrachloride | ND | | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| Chloroform | ND | | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| 1,1-Dichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| 1,2-Dichloroethane | ND | | ppbv | 0.10 | 0.20 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| 1,1-Dichloroethene | ND | | ppbv | 0.10 | 0.20 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| 1,2-Dichloropropane | ND | | ppbv | 0.080 | 0.20 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| 1,2-Dichloro-1,1,2,2-tetrafluoroethane | ND | | ppbv | 0.090 | 0.20 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| Methylene chloride | ND | | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| 1,1,2,2-Tetrachloroethane | ND | | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| Tetrachloroethene | ND | | ppbv | 0.20 | 0.40 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| **1,1,1-Trichloroethane** | **0.21** | J | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| 1,1,2-Trichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| Trichloroethene | ND | | ppbv | 0.20 | 0.40 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| **Trichlorofluoromethane** | **0.46** | | ppbv | 0.20 | 0.40 | 1.0 | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| *Surr: 4-Bromofluorobenzene (70-130%)* | *104 %* | | | | | | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| *Surr: 1,2-Dichloroethane-d4 (70-130%)* | *113 %* | | | | | | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |
| *Surr: Toluene-d8 (70-130%)* | *103 %* | | | | | | 05/31/08 19:37 | gcmsd | DLK | 8F02003 |

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Bellevue, WA 98005
Mike Arnold

Work Order: LRE0179
Project: Normandy Park
Project Number: [none]

Received: 05/21/08 09:45
Reported: 06/06/08 10:10

## PROJECT QUALITY CONTROL DATA

### Blank

| Analyte | Result | Data Qualifier | Units | MDL | RL | Dilution | Date Analyzed | Instrument | Analyst | QC Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sample ID: 8F02003-BLK1 (Blank - Air)** | | | | | | | | | | |
| **EPA TO15 - Volatile Organic Compounds by GC/MS** | | | | | | | | | | |
| Carbon tetrachloride | ND | | ppbv | 0.15 | 0.30 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| Chloroform | ND | | ppbv | 0.15 | 0.30 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| 1,1-Dichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| 1,2-Dichloroethane | ND | | ppbv | 0.10 | 0.20 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| 1,1-Dichloroethene | ND | | ppbv | 0.10 | 0.20 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| 1,2-Dichloropropane | ND | | ppbv | 0.080 | 0.20 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| 1,2-Dichloro-1,1,2,2-tetrafluoroethane | ND | | ppbv | 0.090 | 0.20 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| Methylene chloride | ND | | ppbv | 0.15 | 0.30 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| 1,1,2,2-Tetrachloroethane | ND | | ppbv | 0.15 | 0.30 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| Tetrachloroethene | ND | | ppbv | 0.20 | 0.40 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| 1,1,1-Trichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| 1,1,2-Trichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| Trichloroethene | ND | | ppbv | 0.20 | 0.40 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| Trichlorofluoromethane | ND | | ppbv | 0.20 | 0.40 | 1.00 | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| *Surr: 4-Bromofluorobenzene* | *101%* | | | | | | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| *Surr: 1,2-Dichloroethane-d4* | *103%* | | | | | | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |
| *Surr: Toluene-d8* | *102%* | | | | | | 05/31/08 10:30 | gcmsd | DLK | 8F02003 |

### Blank - Cont.

| Analyte | Result | Data Qualifier | Units | MDL | RL | Dilution | Date Analyzed | Instrument | Analyst | QC Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sample ID: 8F04005-BLK1 (Blank - Air)** | | | | | | | | | | |
| **EPA TO15 - Volatile Organic Compounds by GC/MS** | | | | | | | | | | |
| Carbon tetrachloride | ND | | ppbv | 0.15 | 0.30 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| Chloroform | ND | | ppbv | 0.15 | 0.30 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| 1,1-Dichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| 1,2-Dichloroethane | ND | | ppbv | 0.10 | 0.20 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| 1,1-Dichloroethene | ND | | ppbv | 0.10 | 0.20 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| 1,2-Dichloropropane | ND | | ppbv | 0.080 | 0.20 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| 1,2-Dichloro-1,1,2,2-tetrafluoroethane | ND | | ppbv | 0.090 | 0.20 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| Methylene chloride | ND | | ppbv | 0.15 | 0.30 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| 1,1,2,2-Tetrachloroethane | ND | | ppbv | 0.15 | 0.30 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| Tetrachloroethene | ND | | ppbv | 0.20 | 0.40 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |

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Bellevue, WA 98005
Mike Arnold

Work Order: LRE0179
Project: Normandy Park
Project Number: [none]

Received: 05/21/08 09:45
Reported: 06/06/08 10:10

## PROJECT QUALITY CONTROL DATA

### Blank - Cont.

| Analyte | Result | Data Qualifier | Units | MDL | RL | Dilution | Date Analyzed | Instrument | Analyst | QC Batch |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sample ID: 8F04005-BLK1 (Blank - Air) - cont.** | | | | | | | | | | |
| **EPA TO15 - Volatile Organic Compounds by GC/MS** | | | | | | | | | | |
| 1,1,1-Trichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| 1,1,2-Trichloroethane | ND | | ppbv | 0.15 | 0.30 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| Trichloroethene | ND | | ppbv | 0.20 | 0.40 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| Trichlorofluoromethane | ND | | ppbv | 0.20 | 0.40 | 1.00 | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| *Surr: 4-Bromofluorobenzene* | *100%* | | | | | | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| *Surr: 1,2-Dichloroethane-d4* | *98%* | | | | | | 06/03/08 17:40 | gcmse | DLK | 8F04005 |
| *Surr: Toluene-d8* | *99%* | | | | | | 06/03/08 17:40 | gcmse | DLK | 8F04005 |

### LCS

| Analyte | Result | Data Qualifiers | Units | RL | Dilution | Spike Conc | % Rec | Target Range | Instrument | Date Analyzed | QC Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample ID: 8F02003-BS1 (LCS - Air)** | | | | | | | | | | | |
| **EPA TO15 - Volatile Organic Compounds by GC/MS** | | | | | | | | | | | |
| Chloroform | 11.5 | | ppbv | 0.30 | 1.00 | 10.0 | 115% | 70 - 130 | gcmsd | 05/31/08 09:09 | 8F02003 |
| 1,2-Dichloroethane | 10.8 | | ppbv | 0.20 | 1.00 | 10.0 | 108% | 70 - 130 | gcmsd | 05/31/08 09:09 | 8F02003 |
| 1,1,2-Trichloroethane | 9.48 | | ppbv | 0.30 | 1.00 | 10.0 | 95% | 70 - 130 | gcmsd | 05/31/08 09:09 | 8F02003 |
| Trichlorofluoromethane | 11.0 | | ppbv | 0.40 | 1.00 | 10.6 | 104% | 70 - 130 | gcmsd | 05/31/08 09:09 | 8F02003 |
| *Surr: 4-Bromofluorobenzene* | 4.18 | | ppbv | | 1.00 | 4.00 | 104% | 70 - 130 | gcmsd | 05/31/08 09:09 | 8F02003 |
| *Surr: 1,2-Dichloroethane-d4* | 4.14 | | ppbv | | 1.00 | 4.00 | 104% | 70 - 130 | gcmsd | 05/31/08 09:09 | 8F02003 |
| *Surr: Toluene-d8* | 3.84 | | ppbv | | 1.00 | 4.00 | 96% | 70 - 130 | gcmsd | 05/31/08 09:09 | 8F02003 |

### LCS - Cont.

| Analyte | Result | Data Qualifiers | Units | RL | Dilution | Spike Conc | % Rec | Target Range | Instrument | Date Analyzed | QC Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample ID: 8F04005-BS1 (LCS - Air)** | | | | | | | | | | | |
| **EPA TO15 - Volatile Organic Compounds by GC/MS** | | | | | | | | | | | |
| Chloroform | 9.25 | | ppbv | 0.30 | 1.00 | 10.0 | 92% | 70 - 130 | gcmse | 06/03/08 16:15 | 8F04005 |
| 1,2-Dichloroethane | 9.09 | | ppbv | 0.20 | 1.00 | 10.0 | 91% | 70 - 130 | gcmse | 06/03/08 16:15 | 8F04005 |

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THE LEADER IN ENVIRONMENTAL TESTING
1721 South Grand Avenue Santa Ana, CA 92705 * 714-258-8610 * Fax 714-258-0921

ERM - Bellevue
915 118th Avenue SE Suite 130
Bellevue, WA 98005
Mike Arnold

Work Order: LRE0179
Project: Normandy Park
Project Number: [none]

Received: 05/21/08 09:45
Reported: 06/06/08 10:10

# PROJECT QUALITY CONTROL DATA

## LCS - Cont.

| Analyte | Result | Data Qualifiers | Units | RL | Dilution | Spike Conc | % Rec | Target Range | Instrument | Date Analyzed | QC Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample ID: 8F04005-BS1 (LCS - Air) - cont.** | | | | | | | | | | | |
| **EPA TO15 - Volatile Organic Compounds by GC/MS** | | | | | | | | | | | |
| 1,1,2-Trichloroethane | 8.71 | | ppbv | 0.30 | 1.00 | 10.0 | 87% | 70 - 130 | gcmse | 06/03/08 16:15 | 8F04005 |
| Trichlorofluoromethane | 8.29 | | ppbv | 0.40 | 1.00 | 10.6 | 78% | 70 - 130 | gcmse | 06/03/08 16:15 | 8F04005 |
| *Surr: 4-Bromofluorobenzene* | 4.02 | | ppbv | | 1.00 | 4.00 | 101% | 70 - 130 | gcmse | 06/03/08 16:15 | 8F04005 |
| *Surr: 1,2-Dichloroethane-d4* | 3.88 | | ppbv | | 1.00 | 4.00 | 97% | 70 - 130 | gcmse | 06/03/08 16:15 | 8F04005 |
| *Surr: Toluene-d8* | 4.00 | | ppbv | | 1.00 | 4.00 | 100% | 70 - 130 | gcmse | 06/03/08 16:15 | 8F04005 |

## LCS Dup

| Analyte | Result | Data Qualifiers | Units | RL | Dilution | Spike Conc | % Rec | Target Range | RPD | Limit | Date Analyzed | QC Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample ID: 8F02003-BSD1 (LCS Dup - Air)** | | | | | | | | | | | | |
| **EPA TO15 - Volatile Organic Compounds by GC/MS** | | | | | | | | | | | | |
| Chloroform | 11.5 | | ppbv | 0.30 | 1.00 | 10.0 | 115% | 70 - 130 | 0.4 | 25 | 05/31/08 09:50 | 8F02003 |
| 1,2-Dichloroethane | 10.9 | | ppbv | 0.20 | 1.00 | 10.0 | 109% | 70 - 130 | 0.5 | 25 | 05/31/08 09:50 | 8F02003 |
| 1,1,2-Trichloroethane | 9.40 | | ppbv | 0.30 | 1.00 | 10.0 | 94% | 70 - 130 | 0.9 | 25 | 05/31/08 09:50 | 8F02003 |
| Trichlorofluoromethane | 11.0 | | ppbv | 0.40 | 1.00 | 10.6 | 103% | 70 - 130 | 0.3 | 25 | 05/31/08 09:50 | 8F02003 |
| *Surr: 4-Bromofluorobenzene* | 4.14 | | ppbv | | 1.00 | 4.00 | 103% | 70 - 130 | | | 05/31/08 09:50 | 8F02003 |
| *Surr: 1,2-Dichloroethane-d4* | 4.19 | | ppbv | | 1.00 | 4.00 | 105% | 70 - 130 | | | 05/31/08 09:50 | 8F02003 |
| *Surr: Toluene-d8* | 3.88 | | ppbv | | 1.00 | 4.00 | 97% | 70 - 130 | | | 05/31/08 09:50 | 8F02003 |

## LCS Dup - Cont.

| Analyte | Result | Data Qualifiers | Units | RL | Dilution | Spike Conc | % Rec | Target Range | RPD | Limit | Date Analyzed | QC Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample ID: 8F04005-BSD1 (LCS Dup - Air)** | | | | | | | | | | | | |
| **EPA TO15 - Volatile Organic Compounds by GC/MS** | | | | | | | | | | | | |
| Chloroform | 9.45 | | ppbv | 0.30 | 1.00 | 10.0 | 94% | 70 - 130 | 2 | 25 | 06/03/08 16:58 | 8F04005 |
| 1,2-Dichloroethane | 9.50 | | ppbv | 0.20 | 1.00 | 10.0 | 95% | 70 - 130 | 4 | 25 | 06/03/08 16:58 | 8F04005 |
| 1,1,2-Trichloroethane | 8.23 | | ppbv | 0.30 | 1.00 | 10.0 | 82% | 70 - 130 | 6 | 25 | 06/03/08 16:58 | 8F04005 |
| Trichlorofluoromethane | 8.75 | | ppbv | 0.40 | 1.00 | 10.6 | 83% | 70 - 130 | 5 | 25 | 06/03/08 16:58 | 8F04005 |

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
1721 South Grand Avenue Santa Ana, CA 92705 * 714-258-8610 * Fax 714-258-0921

ERM - Bellevue
915 118th Avenue SE Suite 130
Bellevue, WA 98005
Mike Arnold

Work Order: LRE0179
Project: Normandy Park
Project Number: [none]

Received: 05/21/08 09:45
Reported: 06/06/08 10:10

## PROJECT QUALITY CONTROL DATA

### LCS Dup - Cont.

| Analyte | Result | Data Qualifiers | Units | RL | Dilution | Spike Conc | % Rec | Target Range | RPD | Limit | Date Analyzed | QC Batch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample ID: 8F04005-BSD1 (LCS Dup - Air) - cont.** | | | | | | | | | | | | |
| **EPA TO15 - Volatile Organic Compounds by GC/MS** | | | | | | | | | | | | |
| *Surr: 4-Bromofluorobenzene* | 4.17 | | ppbv | | 1.00 | 4.00 | 104% | 70 - 130 | | | 06/03/08 16:58 | 8F04005 |
| *Surr: 1,2-Dichloroethane-d4* | 3.97 | | ppbv | | 1.00 | 4.00 | 99% | 70 - 130 | | | 06/03/08 16:58 | 8F04005 |
| *Surr: Toluene-d8* | 3.89 | | ppbv | | 1.00 | 4.00 | 97% | 70 - 130 | | | 06/03/08 16:58 | 8F04005 |

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
1721 South Grand Avenue Santa Ana, CA 92705 * 714-258-8610 * Fax 714-258-0921

| | | | | |
|---|---|---|---|---|
| ERM - Bellevue | Work Order: | LRE0179 | Received: | 05/21/08 09:45 |
| 915 118th Avenue SE Suite 130 | | | Reported: | 06/06/08 10:10 |
| Bellevue, WA 98005 | Project: | Normandy Park | | |
| Mike Arnold | Project Number: | [none] | | |

**DATA QUALIFIERS AND DEFINITIONS**

**J** Estimated value. Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). The user of this data should be aware that this data is of limited reliability.

**ND** Not detected at the reporting limit (or method detection limit if shown)

**Environmental Resources Management**

# CHAIN OF CUSTODY RECORD

NO: 4194

915-118th Avenue S.E. Suite 130 ● Bellevue, WA 98005 ● (425) 462-8591 ● FAX (425) 455-3573

LRE0179

Page 1 of 1

| PROJECT # | PROJECT NAME |
|---|---|
| 75720.02 | Normandy Park PCE |

| SAMPLER: (PRINT NAME) | (SIGNATURE) |
|---|---|
| Mike Arnold | |

RECEIVING LABORATORY: Test America Santa Ana, CA

| SAMPLE I.D. | DATE | TIME | COMP | GRAB | SAMPLING METHOD | PRESERVATIVE | ICE (Y/N) | SAMPLING VOLUME | # OF CONTAINERS | MATRIX: SOIL | MATRIX: WATER | MATRIX: GAS | REQUESTED PARAMETERS: Halogenated VOCs only Method TO-15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NP-Basement | 5/20/08 | 1330 | | X | Vacuum | NO | N | 1 canister | 1 | | | / | / |
| NP-Main Floor | 5/20/08 | 1335 | | X | Vacuum | NO | N | ↓ | 1 | | | / | / |
| NP-Outdoor | 5/20/08 | 1345 | | X | Vacuum | NO | N | ↓ | 1 | | | / | / |

| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY | DATE | TIME |
|---|---|---|---|---|---|
| | 5/20/08 | 1615 | | 5/21/08 | 0945 |
| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY | DATE | TIME |
| | | | | | |
| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY | DATE | TIME |
| | | | | | |

FIELD REMARKS:

REMARKS ON SAMPLE RECEIPT

☐ BOTTLE INTACT ☐ CUSTODY SEALS ☐ CHILLED
☐ PRESERVED ☐ SEALS INTACT ☐ SEE REMARKS

ERM REMARKS:

SEND REPORT TO:
Mike Arnold mike.arnold@erm.com

WHITE - LABORATORY COPY CANARY - FIELD COPY PINK - DATABASE MANAGER GOLD - PROJECT FILE

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# CANISTER FIELD DATA RECORD

CLIENT: TEST AMERICA
CANISTER SERIAL #: 3055
DATE CLEANED: 042208C
CLIENT SAMPLE #: _____
SITE LOCATION: _____

VFR ID: _____
Duration of comp. : _____ Hrs. / mins.
Flow setting: _____ ml/min
Initials: _____

| READING | TIME | Vac. (inches Hg) Or PRESS. (psig) | DATE | INITIALS |
|---|---|---|---|---|
| INITIAL VACUUM CHECK | | 30" | 5/16/08 | |
| INITIAL FIELD VACUUM | | | | |
| FINAL FIELD READING | | | | |

| LABORATORY CANISTER PRESSURIZATION | | | |
|---|---|---|---|
| INITIAL VACUUM (Inches Hg / PSIA (circle unit used)) | 14.25 | 5/21/08 | |
| FINAL PRESSURE (PSIA) | 24.62 | 5/21/08 | |

Pressurization Gas: $N_2$

COMMENTS:

| COMPOSITE TIME (HOURS) | FLOW RATE RANGE (ml/min) |
|---|---|
| 15 Min. | 316 – 333 |
| 30 Min. | 158 – 166.7 |
| 1 | 79.2 – 83.3 |
| 2 | 39.6 – 41.7 |
| 4 | 19.8 – 20.8 |
| 6 | 13.2 – 13.9 |
| 8 | 9.9 – 10.4 |
| 10 | 7.92 – 8.3 |
| 12 | 6.6 – 6.9 |
| 24 | 3.5 – 4.0 |

2

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

2

# CANISTER FIELD DATA RECORD

CLIENT: TEST AMERICA
CANISTER SERIAL #: 3001
DATE CLEANED: 042208C
CLIENT SAMPLE #: _____
SITE LOCATION: _____

VFR ID: _____
Duration of comp. : _____ Hrs. / mins.
Flow setting: _____ ml/min
Initials: _____

| READING | TIME | Vac. (inches Hg) Or PRESS. (psig) | DATE | INITIALS |
|---|---|---|---|---|
| INITIAL VACUUM CHECK | | 30.21 | 5/16/08 | |
| INITIAL FIELD VACUUM | | | | |
| FINAL FIELD READING | | | | |

| LABORATORY CANISTER PRESSURIZATION | | | |
|---|---|---|---|
| INITIAL VACUUM (Inches Hg / PSIA) (circle unit used)) | 14.22 | 5/21/08 | |
| FINAL PRESSURE (PSIA) | 23.28 | 5/21/08 | |

Pressurization Gas: $N_2$

COMMENTS:

| COMPOSITE TIME (HOURS) | FLOW RATE RANGE (ml/min) |
|---|---|
| 15 Min. | 316 – 333 |
| 30 Min. | 158 – 166.7 |
| 1 | 79.2 – 83.3 |
| 2 | 39.6 – 41.7 |
| 4 | 19.8 – 20.8 |
| 6 | 13.2 – 13.9 |
| 8 | 9.9 – 10.4 |
| 10 | 7.92 – 8.3 |
| 12 | 6.6 – 6.9 |
| 24 | 3.5 – 4.0 |

3

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# CANISTER FIELD DATA RECORD

3

CLIENT: TEST AMERICA
CANISTER SERIAL #: 1050c
DATE CLEANED: 042208C
CLIENT SAMPLE #:
SITE LOCATION:

VFR ID:
Duration of comp. : Hrs. / mins.
Flow setting: ml/min
Initials:

| READING | TIME | Vac. (inches Hg) Or PRESS. (psig) | DATE | INITIALS |
|---|---|---|---|---|
| INITIAL VACUUM CHECK | | 30.21 | 5/16/08 | |
| INITIAL FIELD VACUUM | | | | |
| FINAL FIELD READING | | | | |

| LABORATORY CANISTER PRESSURIZATION | | | |
|---|---|---|---|
| INITIAL VACUUM (Inches Hg / PSIA (circle unit used)) | 14.28 | 5/20/08 | |
| FINAL PRESSURE (PSIA) | 23.52 | 5/21/08 | |

Pressurization Gas: $N_2$

COMMENTS:

| COMPOSITE TIME (HOURS) | FLOW RATE RANGE (ml/min) |
|---|---|
| 15 Min. | 316 – 333 |
| 30 Min. | 158 – 166.7 |
| 1 | 79.2 – 83.3 |
| 2 | 39.6 – 41.7 |
| 4 | 19.8 – 20.8 |
| 6 | 13.2 – 13.9 |
| 8 | 9.9 – 10.4 |
| 10 | 7.92 – 8.3 |
| 12 | 6.6 – 6.9 |
| 24 | 3.5 – 4.0 |

# CANISTER QC CERTIFICATION

TestAmerica

Certification Type: TO-15 SCAN

Date Cleaned/Batch: 4-22-08C

Date of QC: 04-25-08

Data File Number: MSBOW213 (MS50)

**CANISTER ID NUMBERS**

| | |
|---|---|
| * 3244 | 3417 |
| 2234 | ✓ 1050C |
| ✓ 3001 | 3424 |
| 1060C | 2253 |
| ✓ 3055 | 3009 |
| 1124 | 1291 |

The above canisters were cleaned as a batch. This certifies this batch contains no target analyte concentration greater than or equal to the method criteria for the "*Certification Type*" indicated above.

**"*" INDICATES THE CAN OR CANS WHICH WERE SCREENED.**

Reviewed By: [signature]

Date: 4-25-8

N:\COI\DOCS\TestAmerica DOCs\Can QC Cert 20070712.doc

TestAmerica Los Angeles

AIR LOW LEVEL TO-14A / TO-15

Data file : \\LAPC064\msd_c\chem\gcmsd.i\080424.B\MB04243.D
Lab Smp Id: BLANK Client Smp ID: 3244
Inj Date : 25-APR-2008 07:48
Operator : DLK Inst ID: gcmsd.i
Smp Info : BLANK,3244,,SCREEN BLANK
Misc Info : 1,1,500,500,3,,BLANK,TO15LONG.SUB,0,
Comment :
Method : \\LAPC064\msd_c\CHEM\GCMSD.I\080424.B\TO15.m
Meth Date : 25-Apr-2008 07:36 kammererd Quant Type: ISTD
Cal Date : 11-MAR-2008 12:09 Cal File: IC03118.D
Als bottle: 9 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: TO15LONG.SUB
Target Version: 4.14
Processing Host: LAPC064

Concentration Formula:
Amt * DF * (FinalPres / InitPres)*(CalVol / SmpVol) * CpndVariable

| Name | Value | Description |
|---|---|---|
| DF | 1.000 | Dilution Factor |
| FinalPres | 1.000 | Final Pressure |
| InitPres | 1.000 | Initial Pressure |
| CalVol | 500.000 | Calibration Volume |
| SmpVol | 500.000 | Sample Volume |
| Cpnd Variable | | Local Compound Variable |

| | Compounds | QUANT SIG MASS | RT | EXP RT | REL RT | RESPONSE | CONCENTRATIONS ON-COLUMN ( ppbv) | FINAL ( ppbv) |
|---|---|---|---|---|---|---|---|---|
| | 20 Acetone | 43 | 6.785 | 6.926 | (0.624) | 22629 | 0.50190 | 0.5019(aQ) |
| * | 45 Bromochloromethane | 49 | 10.880 | 10.889 | (1.000) | 193560 | 4.00000 | |
| $ | 52 1,2-Dichloroethane-d4 | 65 | 11.728 | 11.734 | (0.949) | 206441 | 4.73337 | 4.733 |
| * | 60 1,4-Difluorobenzene | 114 | 12.360 | 12.366 | (1.000) | 391410 | 4.00000 | |
| $ | 70 Toluene-d8 | 98 | 14.556 | 14.559 | (0.878) | 379427 | 4.13581 | 4.136 |
| * | 80 Chlorobenzene-d5 | 117 | 16.584 | 16.587 | (1.000) | 396519 | 4.00000 | |
| $ | 92 4-Bromofluorobenzene | 95 | 17.947 | 17.950 | (1.082) | 285312 | 4.04061 | 4.041 |

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.

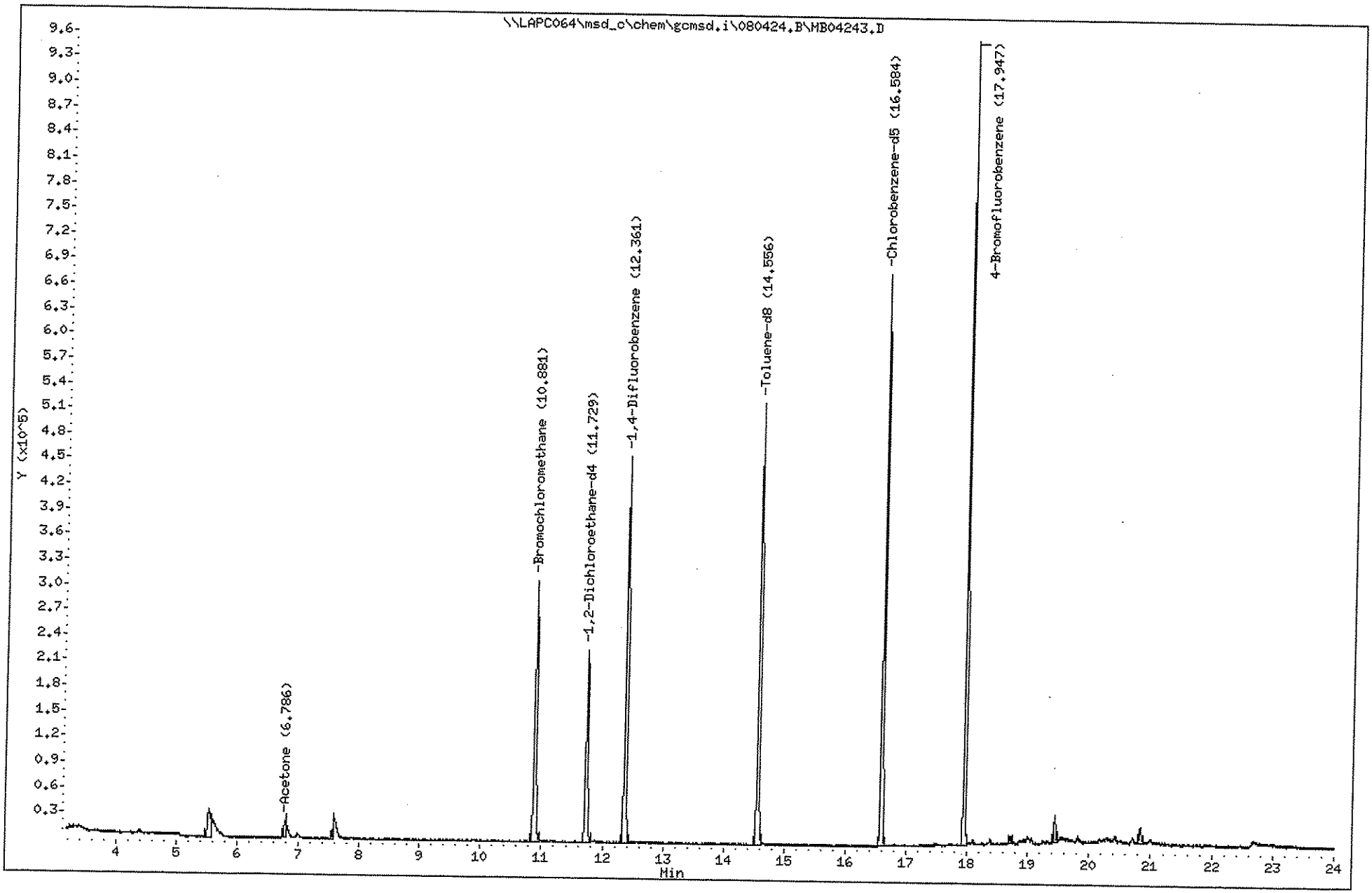
Data File: \\LAPC064\msd_c\chem\gcmsd.i\080424.B\MB04243.D
Date : 25-APR-2008 07:48
Client ID: 3244
Sample Info: BLANK,3244,,SCREEN BLANK

Column phase: J&W DB-5ms

Instrument: gcmsd.i

Operator: DLK
Column diameter: 0.32





*Appendix F*
*Natural Oxidant Demand Analytical Report*

**CARUS CORPORATION**
Technology and Quality
Remediation Report

24 April 2008

| | | | |
|---|---|---|---|
| Customer: | ERM<br>915-118th Avenue S. E. Suite 130<br>Bellvue, WA 98005 | Cc: | M. Dingens<br>K. Frasco<br>J. Tarka |
| Attention: | Olivia Williams | | |
| From: | E. Vlastnik | Keywords: | Permanganate<br>Remediation |
| TECH # | 10785 | | Soil |
| Subject: | RemOx® S ISCO Reagent Permanganate Natural Oxidant Demand | | |

**Summary**
The overall average RemOx® S ISCO Reagent permanganate natural oxidant demand (PNOD) for the four soil samples at 48 hours was determined to be 0.7 g/kg. The average demands ranged from 0.6 g/kg for MW-4-40 and MW-7-42 to 0.8 g/kg for MW-3-43.5 and MW-5-43. These values are calculated on a weight as potassium permanganate ($KMnO_4$) per dry weight of soil. Based on these soil demands, in-situ chemical oxidation with permanganate is recommended for this site.

**Background**
Four soil samples were received from ERM from the Normandy Park Project (Project #: 75720) on April 15, 2008. The soil samples were collected on April 8 and 10, 2008 and described as MW-3-43.5, MW-4-40, MW-5-43, and MW-7-42. The samples were analyzed for permanganate natural oxidant demand following ASTM D7262-07 Test Method A. The measurement of the permanganate natural oxidant demand is used to estimate the concentration of permanganate that will be consumed by the natural reducing agents during a given time period of 48 hours.

**Experimental**
The samples were analyzed for permanganate natural oxidant demand following ASTM D7262-07 Test Method A. A brief summary is as follows:

To determine the PNOD, the soil was baked at 105°C for 24 hours then allowed to cool to room temperature. The soil was then blended and passed through a U.S. 10 sieve (2 mm). For each sample reactors were loaded with 50 grams soil and 100 ml of 20.0 g/L $KMnO_4$ for an initial dose of 40.0 g/kg $KMnO_4$ on a dry soil weight basis at a 1:2 soil to aqueous reagent ratio. Each soil dose was performed in triplicate. The reaction vessels were inverted once to mix the reagents. Residual permanganate ($MnO_4^-$) was determined at 48 hours. The demands were calculated on a dry weight basis.

**Results**
The permanganate demand is the amount of permanganate consumed in a given amount of time. It should be noted that in a soil or groundwater sample, the oxidation of any compound by

permanganate is dependent on the initial dose of permanganate and the reaction time available. As the permanganate dose is increased, the reaction rate and oxidant consumption may also increase. Some compounds that are not typically oxidized by permanganate under low doses can become reactive with permanganate at higher concentrations. Therefore, increasing the permanganate dose to extreme excess could be disadvantageous to a remediation project (e.g., inefficient chemical usage, higher costs, etc.).

The 48-hour PNOD results can be seen in Table 1 (on a dry soil basis).

**Table 1:** 48-Hour PNOD *

| Soil Sample Identification | Average and Standard Deviation (g/kg) | Replicate 1 (g/kg)) | Replicate 2 (g/kg) | Replicate 3 (g/kg) |
|---|---|---|---|---|
| MW-3-43.5 4/8/08 0945 | 0.8 ± 0.1 | 0.7 | 0.9 | 0.9 |
| MW-4-40 4/8/08 1230 | 0.6 ± 0.1 | 0.5 | 0.7 | 0.6 |
| MW-5-43 4/8/08 1550 | 0.8 ± 0.8 | 0.8 | 0.9 | 0.8 |
| MW-7-42 4/10/08 935 | 0.6 ± 0.1 | 0.5 | 0.6 | 0.7 |
| Overall Average | 0.7 | | | |

*Demands were calculated on a weight $KMnO_4$/dry soil weight basis from an initial dose of 40.0 g/kg $KMnO_4$ initial dose at a 1:2 soil to aqueous solution ratio.

**Conclusions**

For this application the amount of permanganate needed will be dependent on the reaction time allowed. On average, the soil samples had a low demand with the 48-hour permanganate demand value 0.7 g/kg. The soil demands ranged from 0.6 g/kg for MW-4-40 and MW-7-42 to 0.8 g/kg for MW-3-43.5 and MW-5-43. Generally, remediation sites with a soil demand of less than 35.0 g/kg at 48 hours are favorable for in-situ chemical oxidation with permanganate (see Table 2 for additional information). A pilot study or good characterization is generally recommended to confirm laboratory results and determine the parameters for a full-scale trial.

**Table 2:** Correlation of Permanganate Natural Oxidant Demand Results*

| **PNOD (g/kg)** | **Rank** | Comment |
|---|---|---|
| <15 | Low | ISCO with $MnO_4^-$ is recommended. PNOD contribution to $MnO_4^-$ demand is low. |
| 15-35 | Moderate | ISCO with $MnO_4^-$ is recommended. |
| 35-50 | Moderately High | ISCO with $MnO_4^-$ is recommended but PNOD will contribute significantly to $MnO_4^-$ demand. Pilot testing may help define these demands. |
| >50 | High | Pilot testing is highly recommended to determine effective PNOD at the site. |

*Dry Weight Basis

RemOx® ISCO Reagent is a registered trademark of Carus Corporation

**Environmental Resources Management**

# CHAIN OF CUSTODY RECORD

NO: 4473

915-118th Avenue S.E. Suite 130 ● Bellevue, WA 98005 ● (425) 462-8591 ● FAX (425) 455-3573 Tech 10785

Page 1 of 1

| PROJECT # | PROJECT NAME |
|---|---|
| 75720 | Normandy Park |

| SAMPLER: (PRINT NAME) | (SIGNATURE) |
|---|---|
| Kevin Knesek | for K. Knesek |

**RECEIVING LABORATORY**

Canus Chemical Company Attn: Beth Vlastnik
1500 8th St
LaSalle, IL 61301 (810)435-6856

| SAMPLE I.D. | DATE | TIME | COMP | GRAB | SAMPLING METHOD | PRESERVATIVE | ICE (Y/N) | SAMPLING VOLUME | # OF CONTAINERS | MATRIX: SOIL | MATRIX: WATER | MATRIX: GAS | REQUESTED PARAMETERS: Natural Oxidant Demand ASTM D7262-07 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-3-43.5 | 4/8/08 | 0945 | | X | | | Y | | 2 | X | | | X |
| MW-4-40 | 4/8/08 | 1230 | | X | | | Y | | 2 | X | | | X |
| MW-5-43 | 4/8/08 | 1550 | | X | | | Y | | 2 | X | | | X |
| MW-7-42 | 4/10/08 | 0935 | | X | | | Y | | 3 | X | | | X |
| | | | | | | | X | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY | DATE | TIME |
|---|---|---|---|---|---|
| Olivia Williams | 4/14/08 | 1300 | FedEx | 4/14/08 | |
| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY | DATE | TIME |
| | | | Beth Vlastnik | 4/15/08 | 1.30 pm. at stockroom 2 12:30 pm m. |
| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY | DATE | TIME |
| | | | | | |

**FIELD REMARKS**

3 jars collected for MW-7-42 due to smaller sampling containers

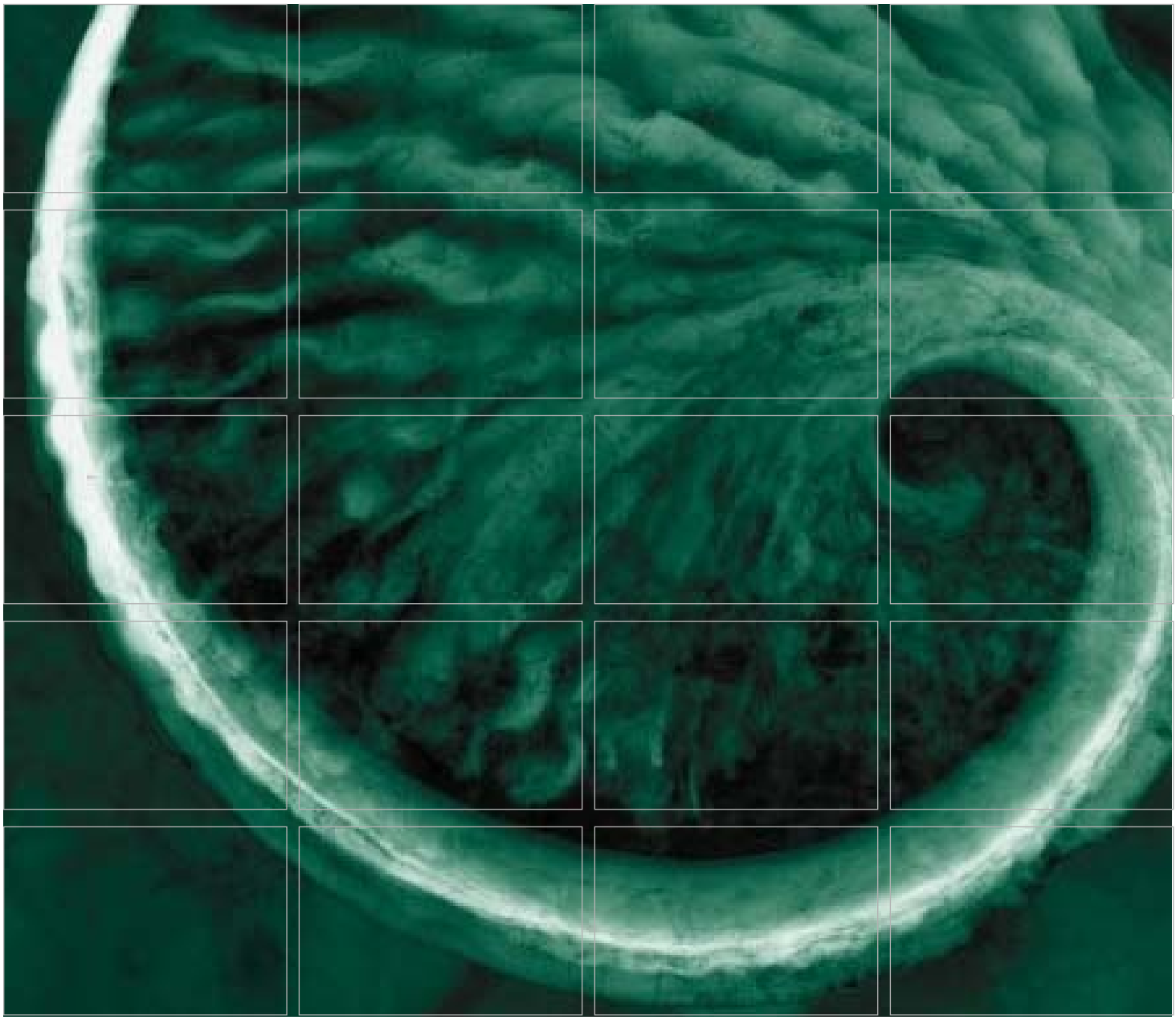
**REMARKS ON SAMPLE RECEIPT**

☐ BOTTLE INTACT ☐ CUSTODY SEALS ☒ CHILLED 10C on when opened
☐ PRESERVED ☐ SEALS INTACT ☐ SEE REMARKS

**ERM REMARKS**

**SEND REPORT TO:** Olivia Williams
olivia.williams@erm.com

WHITE - LABORATORY COPY CANARY - FIELD COPY PINK - DATABASE MANAGER GOLD - PROJECT FILE



# FINAL Soil Vapor Extraction Interim Remedial Action Design and Work Plan

**Prepared for:**
Riddell Williams P.S. and
Wolfstone, Panchot & Bloch, P.S.

**Manhattan Village Shopping Center and Harris Properties**
**17817-17825 and 17835 1st Avenue South**
**Normandy Park, Washington**

March 2009

www.erm.com

ERM

*Delivering sustainable solutions in a more competitive world*

Riddell Williams P.S. and Wolfstone, Panchot & Bloch, P.S.

# FINAL Soil Vapor Extraction Interim Remedial Action Design and Work Plan

*Manhattan Village Shopping Center and Harris Properties*
*17817-17825 and 17835 1st Avenue South*
*Normandy Park, Washington*

March 2009

Project No. 0092621

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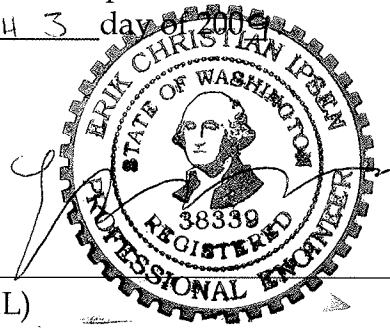
**ENGINEER'S CERTIFICATION**

I, ERIK C. IPSEN, Professional Engineer in the State of Washington, hereby certify to the best of my knowledge and belief that this design document is true and correct and has been prepared in accordance with general industry standards and applicable federal, state, and local requirements, and hereunto set out hand and affix my seal this MARCH 3 day of 2009.




(SEAL)

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## *LIST OF ACRONYMS*

| | |
|---|---|
| bgs | Below ground surface |
| cfm | Cubic feet per minute |
| Ecology | Washington State Department of Ecology |
| GAC | Granular activated carbon |
| HASP | Health and Safety Plan |
| HP | Horsepower |
| IRA | Interim remedial action |
| MTCA | Model Toxics Control Act |
| MVSC | Manhattan Village Shopping Center |
| O&M | Operation and Maintenance |
| µg/m3 | micrograms per cubic meter |
| µg/kg | micrograms per kilogram |
| µg/L | micrograms per liter |
| PCE | Tetrachloroethene, tetrachloroethylene |
| PE | Polyethylene |
| PID | Photoionization detector |
| PSCAA | Puget Sound Clean Air Agency |
| PVC | Polyvinyl chloride |
| SAP | Sampling and Analysis Plan |
| SEPA | Washington State Environmental Policy Act |
| SVE | Soil vapor extraction |
| WAC | Washington Administrative Code |
| VOC | Volatile organic compound |
| USEPA | U.S. Environmental Protection Agency |

## *1.0 INTRODUCTION*

ERM-West, Inc. (ERM) has prepared this Soil Vapor Extraction Interim Remedial Action Work Plan (Work Plan) for the Manhattan Village Shopping Center (MVSC) and Harris Property (collectively, "the Site") located in Normandy Park, Washington. The purpose of this Work Plan is to provide details regarding the design and planned construction of a soil vapor extraction (SVE) interim remedial action (IRA) to reduce the mass of tetrachloroethene (PCE) in the Site soils. This Work Plan was developed in accordance with the Interim Actions section of the Model Toxics Control Act (MTCA) Cleanup Regulation from the Washington Administrative Code (WAC) 173-340-430.

## *1.1 REGULATORY FRAMEWORK*

The MTCA Cleanup Regulation (WAC 173-340) applies to the discovery, investigation, and remediation of contaminated sites in Washington. The analytical results for soil and groundwater samples collected from the Site were compared to the MTCA Method A Cleanup Levels (WAC 173-340-900). MTCA Method A Cleanup Levels are conservative compliance standards for common contaminants at sites with relatively few hazardous substances present.

PCE was detected in soil samples obtained during the March 2008 through August 2008 field investigation activities. Project screening levels were developed for each detected compound based on applicable MTCA cleanup levels. The project screening level for PCE in soil is 50 micrograms per kilogram (µg/kg), based on MTCA Method A Soil Cleanup Level for Unrestricted Land Uses (WAC 173-340-900, Table 740-1).

Implementation of the IRA will be conducted in general accordance with applicable sections WAC 173-340-430, Interim Actions.

## *1.2 BACKGROUND*

### *1.2.1 Site Description*

The MVSC and Harris properties are adjacent to the west of 1st Avenue South, as shown in Figure 1. A Site plan map is included in Figure 2. The MVSC is approximately 4 acres in area and consists of four buildings connected by a paved parking area with scattered small landscaped areas. The address of the property is 17827 1st Avenue South. The southern building in the shopping center is a single-story QFC grocery store. To the east of the QFC there is a single-story structure currently used as a day care facility. North of the QFC is a strip mall that holds restaurants, retail shops, and a dry cleaning facility (Four Star Dry Cleaners). A building, currently unoccupied, is located east of the strip mall building and previously housed a Dairy Queen restaurant.

The Harris property includes six contiguous tax parcels with a total area of approximately 3.3 acres adjacent to the north of the MVSC property. The Harris property is occupied by two residential structures, two single-story commercial buildings, and a storage shed. The commercial properties are at addresses of 17801 and 17817 1st Avenue South, and the residential properties are at 137 and 145 Southwest 178th Street. Ground cover near the commercial buildings is mixed pavement and gravel, and the residences are surrounded by lawn and landscaped areas. Two of the tax lots (approximately 48,000 square feet) of the Harris property are undeveloped. Records suggest that a dry cleaning facility (Manhattan Cleaners and Coin-Op Laundry) previously operated in the southernmost commercial building at the Harris property.

Vadose-zone soils across the Site generally consist of silt, interbedded silt and sand, and sand from the ground surface to groundwater, which is typically encountered at depths ranging from approximately 23 to 40 feet below ground surface (bgs). Saturated zone soils are primarily sand with some silt and gravel. Groundwater flow is generally toward the north across both properties.

### *1.2.2 Previous Investigation Activities*

PCE has been detected in soil and groundwater at the Site, and available data indicate past releases of PCE from dry cleaning operations at Four Star Dry Cleaners facility in the MVSC and from the former Manhattan Cleaners and Coin-Op Laundry on the Harris property. Multiple phases of investigation have been performed by the landowners to evaluate the

nature and extent of the soil and groundwater impacts on their respective properties. The most recent soil and groundwater investigation was performed in March 2008 through August 2008.

The results of soil and groundwater investigations suggest that PCE releases have resulted in vadose zone soil impacts in the in the vicinity of former septic systems at both properties, and sanitary and storm sewer lines at the MVSC property. PCE has been detected in vadose zone soils at the Site at concentrations greater than the Washington State MTCA Method A Cleanup Level of 50 µg/kg in some locations. The distribution of soil with PCE concentrations greater than the MTCA Method A cleanup level based on the most recent soil sample results is shown on Figure 3.

Groundwater sampling results indicate that dissolved PCE in groundwater is distributed from the vicinity of the Four Star Dry Cleaners facility and former sanitary sewer line, across the Harris property to the north, to the Dunn Lumber property north of the Harris property across Southwest 178th Street. During the April 2008 sampling event, PCE was detected in 19 of the 20 groundwater samples collected from the Site wells, and concentrations of the compound were greater than the MTCA Method A Cleanup Level of 5 micrograms per liter (µg/L) in 10 of the samples.

### *1.2.3 Previous Remediation Activities*

Limited soil remediation by SVE was performed at the MVSC property in 1999 and 2000. Results of this remediation indicate that the system recovered a significant mass of volatile organic compounds (VOCs) from Site soils. Available data indicate that the SVE system was effective at removing significant PCE mass from soils, but that the SVE system was decommissioned before PCE concentrations in soil decreased to less than the applicable cleanup standard. A significant decrease in PCE concentrations in groundwater across much of the Site was observed during the period of SVE operation, suggesting that SVE operation may have positively affected groundwater quality. Soil investigation results from 2008 at the MVSC property indicate that residual areas of PCE above the MTCA Method A soil cleanup standard of 50 µg/kg persist in vadose-zone soils in the vicinity of Four Star Dry Cleaners facility. An area of detections of PCE greater than the cleanup level is also present in the eastern portion of the Harris property near the location of a former septic tank system that likely received waste from the former Manhattan Cleaners and Coin-Op Laundry on that property.

The septic tanks on the Harris property were removed in 2006. PCE and related VOCs were detected in the sludge inside the tanks, as well as in soils near the tanks. Approximately 37 tons of soil and concrete were removed from the vicinity of the tanks and disposed. No VOCs were detected at concentrations greater than applicable MTCA cleanup levels in the excavation limit samples collected after soil removal activities were complete.

### *1.2.4 Selection of Interim Cleanup Action*

Limited soil remediation by SVE was performed at the MVSC property in 1999. Results of this remediation indicate that the system was effective in recovering a significant mass of PCE from Site soils. SVE was selected as the preferred remedial alternative for the IRA because of the ease of implementability over the other alternatives, which each require excavation of soils. Excavation was determined to be an unacceptable alternative because of the presence of buildings over and near the PCE-impacted soils, as well as the depth of PCE impacts, which are greater than 30 feet bgs in some areas.

## *1.3 INTERIM REMEDIAL ACTION OBJECTIVE*

The objective of the SVE IRA described in this Work Plan is to reduce the mass of PCE in the soil at the Site to less than the MTCA Method A soil cleanup level of 50 µg/kg.

## *1.4 GENERAL APPROACH*

The IRA will consist of installing ten SVE wells at the Site to induce soil vapor extraction in areas where sampling has indicated PCE-impacted soils above the cleanup level are located. SVE wells will be located on the MVSC and Harris Properties in the areas of PCE in unsaturated soils at concentrations greater than the cleanup level. The SVE wells will be screened in the vadose zone above the groundwater table. Sampling of the extracted vapors will be conducted to monitor the effectiveness of the SVE in soils during system operation. Existing Site wells will be used to monitor the effectiveness of the SVE system, if any, on groundwater quality. SVE effluent will be discharged directly to the atmosphere, unless odor concerns require treatment with granular activated carbon (GAC) prior to discharging to the atmosphere. Design drawings for the construction of the SVE system are included in Appendix A.

If required based on vacuum monitoring during system operation, a low-permeability cover system may be installed over the area of influence of the primary row of SVE wells to reduce short circuiting of ambient air from above grade within the wells' radii of influence. The cover would encourage air from outside the area of influence to be drawn through the impacted soils and captured by the SVE wells. Additionally, an air inlet well may be installed on the south side of the MVSC building to induce northward subsurface airflow to capture impacted soils beneath the building.

The network of SVE wells has been designed to address the areas of the Site designated as having PCE impacts at or above the MTCA Method A Cleanup Level of 50 µg/kg. The system is planned to be operated continuously while alternating the wells that will be extracting vapors on a monthly basis to encourage air flow from the area of impact. The wells that are not drawing vapors will be configured to act as ambient air inlet wells. IRA performance will be monitored by monthly vapor sampling and semiannual groundwater sampling during system operation. Compliance with remedial action objectives will be demonstrated by evaluation of PCE concentrations in soil samples to be collected from borings once it is believed remedial action objectives have been met based on performance monitoring results.

## *1.5 WORK PLAN ORGANIZATION*

This Work Plan consists of five sections and two appendices. The contents of this Work Plan are divided into the following sections:

- Section 1.0 – Introduction: A description of overall project objectives and general site background information;
- Section 2.0 – System Design: A description of the design parameters, equipment, and assumptions for the SVE system;
- Section 3.0 – IRA Implementation: A description of the specific activities involved with the installation, start-up, operations and maintenance (O&M), performance monitoring, reporting, and effectiveness monitoring of the remediation system;
- Section 4.0 – Reporting: A brief summary of the various reports to be submitted throughout the installation, operation, and decommissioning of the IRA; and

- Section 5.0 – References: A list of reference documents used during preparation of this Work Plan.

The appendices consist of the following information:

- Appendix A: Construction Drawings;
- Appendix B: Design Calculations

## *2.0 SYSTEM DESIGN*

The IRA system consists of extraction, treatment, and discharge stages for vapor phase contaminants. Ten SVE wells will remove and convey soil vapors to the central treatment system. The treatment system consists of a knock-out tank to remove condensate from the vapor, GAC adsorption of contaminants from the vapor stream (option for odor control), and discharge of the treated vapors into the atmosphere. The system is expected to operate at an overall air flow rate of approximately 150 cubic feet per minute (cfm), although the actual operational flow rate will be determined through system startup testing.

The following sections describe the major components of the SVE system, their function, and key process control equipment and parameters associated with these components. Construction drawings showing the layout and details of the various system components are included in Appendix A.

## *2.1 EXTRACTION AND AIR INLET WELLS*

Ten SVE wells (SVE-1 through SVE-10) will be installed west of the commercial building on the Harris property, along the southern Harris property boundary, and in the northwest portion of the MVSC property (see Appendix A, Drawing C-1). The extraction wells will be two-inch-diameter polyvinyl chloride (PVC) wells with 5- to 25-foot screens. One well, SVE-6, is intended to address shallow soil impacts, and will be constructed with a two-inch diameter PVC well casing with a 5-foot screen (see Appendix A, Drawing C-4). The wells will be screened above the groundwater table to extract impacted vapors from the vadose zone. A sealed wellhead assembly will be installed at the top of the casing to prevent short-circuiting of airflow from within the borehole. The extraction wells will be installed as described in Section 3.3. The extraction well design is shown on Drawing C-4 in Appendix A.

If it is determined during system monitoring that adequate air flow is not being achieved in soils beneath the MVSC building, an air inlet well may be installed south of the MVSC building in the asphalt parking lot. The air inlet well would be a two-inch diameter PVC well with a 25-foot screen. The wellhead would remain valved open to allow ambient air to be drawn into the subsurface and pulled toward the extraction system. If well

construction is appropriate, well DC-1 may alternately be retrofitted as a venting well.

The SVE wells will be operated by alternating wells that extract vapors and wells that induce subsurface air flow manually on a monthly basis. The SVE wells that will be used for air inlet purposes for the month will be closed off from the vacuum blower and opened to the atmosphere to draw in ambient air into the well which will migrate through the impacted soils and be collected by the functioning SVE wells. The alternating SVE/air inlet well operation is described in more detail in Section 3.7.2 and will also be discussed in the project O&M manual to be developed after system installation.

## *2.2 LOW-PERMEABILITY COVER*

If vacuum monitoring during system operation shows that the influence of the SVE system does not extend across the inferred impacted area beneath the MVSC building, a low-permeability cover may be installed over the northern portion of the SVE area of influence on the undeveloped section of the Harris Property. The cover would serve to increase influence of the vapor extraction system to draw impacted soil vapors from beneath the MVSC building, and not merely draw ambient air from the ground surface in the undeveloped area to the north of the building. The cover may consist of a compacted clay layer, spray-on tackifier solution, or high-density polyethlyene geomembrane. Additional details regarding the low-permeability cover will be provided to Washington State Department of Ecology (Ecology) if the cover is deemed necessary based on the SVE system performance monitoring results.

## *2.3 PIPING*

Extracted soil vapors will be conveyed from the SVE wells to the treatment system in a piping network consisting of two-inch and six-inch diameter Schedule-40 PVC pipe rated at 75 pounds per square inch, minimum. The piping from wells SVE-1, SVE-2, and SVE-6 (in paved areas on the MVSC property) and SVE-10 (in the gravel parking lot on the Harris Property) will be installed in a trench to minimize the impact to the portions of the Site that experience vehicular traffic. The piping connections from the six remaining SVE wells and the main trunk line connecting the wells to the treatment system will be installed above grade as shown on Drawing C-5 in Appendix A. Pipeline vacuum pressures and

flow rates will be monitored using vacuum gauges and flow meter monitoring ports at the SVE well heads and at the treatment system.

An additional 2-inch diameter Schedule 40 PVC pipe will be placed in the trench on the MVSC property from the SVE-1 well vault north to the retaining wall between the MVSC and the Harris properties. The additional pipe may be used for future air sparging remedial activities, currently considered as part of one of the remedial alternatives for groundwater at the Site. The pipe will be placed during SVE system construction to minimize potential future trenching needs in the MVSC paved area. The additional pipe will terminate with capped ends in the SVE-1 vault box and at the retaining wall to allow easy access for use in future remedial activities.

## *2.4 TREATMENT SYSTEM*

The IRA treatment system will be located inside a six-foot tall chain-link fence in the undeveloped portion of the Harris Property, north of the MVSC (see Appendix A, Drawing C-2). A knockout tank will be installed upstream of the regenerative blower to separate the liquid condensate from the extraction system. The knockout tank will be fitted with a centrifugal pump to discharge collected fluids to a polyethylene (PE) storage tank. The regenerative blower will have a 5-horsepower motor and be capable of creating a vacuum of 15 inches of water at 250 cfm with standard operation anticipated to be around 150 cfm (see calculations, Appendix B). Based on the anticipated mass of PCE to be removed by the SVE system, regulations do not require treatment of the vapor prior to discharge to the atmosphere. If odor concerns are identified, extracted soil vapor will be treated prior to discharge using one 400-pound capacity GAC vessel installed after the SVE blower. A piping and instrumentation diagram of the SVE system is included as Drawing C-3 in Appendix A.

The vapor stream will be discharged to the atmosphere via a discharge stack in the treatment area. Based on the maximum anticipated PCE removal rate calculated (see Section 2.9), the system will not require an air operating permit from the Puget Sound Clean Air Agency (PSCAA), the regional air regulatory agency. According to PSCAA Regulation I, Section 6.03(c)(94), soil and groundwater remediation projects involving less than 500 pounds per year of PCE are exempt from all permitting and notification requirements provided that sufficient records are maintained to document the exemption.

During system operation, VOC concentrations will be monitored routinely at the point of discharge to ensure the system remains exempt from PSCAA air quality regulations. If a GAC vessel is used, VOC concentrations will be monitored both at the inlet and outlet of the vessel.

## *2.5 WATER DISCHARGE*

Condensate accumulated in the knock-out tank will transferred automatically when a high-level float switch is triggered. The water will be pumped via a centrifugal transfer pump to a 200-gallon PE storage tank located in the treatment area. When the condensate storage tank is near capacity, the water will be tested and disposed of accordingly by an approved vendor as a hazardous or non-hazardous waste. Cold weather condensate generation calculations have been included in Appendix B.

## *2.6 CONTROLS*

A programmable logic control system will be located in the treatment system enclosure to automatically control various treatment system operating parameters (i.e. blower speed, auto shut-offs, etc.). Onsite controls for the system will include the following:

- Blower (flow) control;
- Transfer pump control;
- Hour meter; and
- System power (start-up/shut-down).

A supervisory control and data acquisition system will be used to remotely monitor system operation. The cellular autodialer would alert ERM, as the operational contractor, to major mechanical issues, such as power interruption, blower shutoff, and loss of emission control. System alarms will include:

- Blower high-temperature alarm;
- Knock-out tank high-liquid-level alarm;
- 200-gallon knock-out water storage tank high-liquid-level alarm;
- GAC vessel high-pressure and high temperature alarms, if GAC is used; and

- System shutdown alarm.

The remediation system will be configured to automatically shut down operation if any alarms are triggered.

## *2.7 POWER SUPPLY*

Electric utility for the remediation system is required for the vacuum pump and the programmable logic control/supervisory control and data acquisition control system. The blower is expected to require 3-phase, 240 voltage, and 60 Hertz frequency power supply. It is anticipated that the power drop located near the treatment system enclosure will be utilized for the operation of the SVE system.

## *2.8 VAPOR MONITORING PROBES*

Six vapor monitoring probes (VMP-1 through VMP-6) were installed in March 2008 at the locations shown on Drawing C-1 in Appendix A. The vapor monitoring probes consist of ¾-inch diameter PVC probes with 0.010-inch slotted screens installed between 10 and 15 feet bgs. The probes will be used to monitor subsurface vacuum and VOC concentrations during the IRA.

## *2.9 ANTICIPATED SYSTEM PERFORMANCE*

Soil vapor analytical data that were collected during previous Site investigations and remedial efforts were used to estimate the PCE mass emission from the SVE system. A copy of the mass removal calculations at the airflow rate of 150 cfm is provided in Appendix B.

Mass removal estimations were based on a concentration versus airflow calculation. The maximum soil vapor PCE concentration observed during the previous Site SVE system operation was approximately 52 µg/L (52,000 micrograms per cubic meter[µg/$m^3$]) (Farallon 2004). An average of 30.65 µg/L (30,650 µg/$m^3$) PCE from four vapor sampling events was used to estimate mass removal rates. At an estimated average airflow rate of 150 cfm (25 cfm per well, six wells operating simultaneously), the maximum estimated annual removal for PCE was calculated to be approximately 151 pounds. This is a conservative estimate based on limited soil vapor concentration data. Vapor concentrations often

decrease rapidly during SVE operation, so it is anticipated that the actual mass of PCE removed from the subsurface will be less than the calculated value.

The estimated daily mass removal rates is based on several assumptions, including that the emission concentrations remain constant and the SVE system is operating continuously throughout the year. Typically, in-situ mass varies over time, and SVE systems do not operate continuously throughout the year due to malfunctions or modifications to system operations. Therefore, the actual mass removed may be less than this calculated estimate.

# *3.0 INTERIM REMEDIAL ACTION IMPLEMENTATION*

## *3.1 REGULATORY NOTIFICATION*

Ecology will be notified of the proposed IRA as part of the Voluntary Cleanup Program and will be provided with all reports referenced in this Work Plan.

## *3.2 SCHEDULE*

The selected remedial alternative will be implemented in general accordance with the following schedule:

| Task | Estimated Timeframe | Estimated Calendar Schedule |
|---|---|---|
| 1 - Construction and Startup of Remediation System | 6 weeks | Spring 2009 |
| 2a - Operation and Maintenance of Remediation System | 1 year (estimated) | Spring 2009 – Spring 2010 |
| 2b - Remedial Effectiveness Monitoring (concurrent with previous task) | 1 year | Spring 2009 – Spring 2010 |
| 3 – Confirmation Sampling, System Decommissioning, Reporting, and Site Restoration | 3 months | Spring 2010 – Summer 2010 (dependant upon system monitoring results) |

The system operation will be assessed after one year of operation to evaluate the effectiveness of meeting the remedial objective of achieving the soil cleanup level. An evaluation of the potential of PCE mass reduction of dissolved-phase PCE concentrations in groundwater will also be completed. Recommendations for system modifications, if required, will be made at this time. Note that if remedial goals have not been met at the end of one year, additional system operation may be required prior to implementation of Task 3 - Confirmation Sampling, System Decommissioning, Reporting, and Site Restoration.

## *3.3 SITE PREPARATION*

Prior to any drilling or trenching activities, the proposed locations of the SVE wells and piping trenches will be marked using white spray paint. A site meeting will be arranged to identify and mark applicable utilities that require clearance. At least five days before any subsurface work is scheduled to begin, a One-Call ticket will be placed to mark the location of utilities accessing the Site from public right-of-way. A private locating company will be contracted to mark the location of utilities on the Site. Additionally, all wells will be manually cleared using an air knife/vacuum truck, or other applicable clearance method to a minimum depth of 4 feet bgs. If it is determined that drilling or excavation at any of the planned locations could interfere with underground utilities, the planned well or trench will be relocated a safe distance away from the utilities, but as close as possible to the original planned location.

## *3.4 WELL INSTALLATION*

Ten SVE wells will be installed as part of the IRA. The proposed locations and construction diagrams of the wells are shown on the Construction Drawings in Appendix A. The SVE wells will be installed by a Washington-licensed driller. During drilling, geologic samples will be collected at 2.5-foot intervals for lithological logging. An experienced field geologist will log the soil samples, monitor the drilling activities, record the well installation procedures, and prepare a boring log and well construction diagram for each new SVE well.

The wells will be constructed of 2-inch diameter, threaded, flush-joint, Schedule-40 PVC casing with 5 to 25 feet of 0.020-inch machine-slotted PVC screen (see Table in on Sheet C-4, Appendix A for specific well construction details). The annular space between the well screen and the borehole wall will be backfilled with a clean silica sand filter pack up to two feet above the top of the well screen. The wells will be sealed from the top of the sand pack to approximately two feet bgs with hydrated bentonite chips. The wellhead assembly installed at the top of the well casing will include a vacuum gauge, flow sensor pressure gauge, sample port, and PVC ball valve. Each wellhead assembly in trafficked areas (SVE-1, SVE-2, SVE-6, and SVE-10) will be completed within a flush-mount 3-foot by 2-foot by 1.5-foot vault. All other wellheads will be completed above grade. The SVE well heads will include a vapor sampling port, a flow measurement port, a vacuum gauge, a tee with ball valve to allow for operation as air inlet well, and a ball valve on the vacuum line for

controlling air flow. Details for construction of the SVE wells and wellheads are shown on Drawing C-4 in Appendix A.

Nine of the vapor extraction wells (SVE-1 through SVE-5 and SVE-7 through SVE-10) will be installed using a hollow-stem auger rig. SVE-6 will be installed by using an air knife/vacuum truck to the total depth of 10.5 feet bgs because of the close proximity of utility lines (gas and sanitary sewer) in the alley behind the MVSC building.

## *3.5 TRENCHING AND PIPING*

Trenches shall be a minimum of 12 inches wide and excavated to a minimum depth of three inches deeper than the bottom of the installed pipe (see details on Drawing C-5, Appendix A). The Schedule-40 PVC SVE and air sparge pipes will be placed in a minimum 4-inch thick sand bedding. Buried pipes will have 12 inches of compacted sand cover overlain by nominally compacted backfill. Backfill under paved areas will be compacted to 90 percent of modified proctor density and paved to match the existing ground surface. Underground pipes will be buried a minimum of 36 inches below grade.

## *3.6 EQUIPMENT INSTALLATION*

The primary aboveground SVE equipment includes the blower system and vapor treatment equipment. The SVE equipment will be skid-mounted inside a chain-link fence and includes the following components:

- Regenerative blower powered by a 5-horsepower explosion-proof electric motor rated for a flow rate of 150 cfm at a vacuum of 60 inches of water ;
- Moisture knock-out tank;
- Cartridge filters; and
- 200-gallon PE condensate storage tank.

## *3.7 OPERATION AND MAINTENANCE*

This section discusses key aspects of system operation, including startup procedures and ongoing maintenance necessary to establish and maintain the desired system operation parameters. A project-specific O&M plan

including guidelines for overall system operation, manufacturer's recommendations for equipment maintenance, preventative maintenance schedules, and documentation forms will be developed for the remediation system prior to system startup.

### *3.7.1 System Startup*

Upon completion of construction, the remediation system will undergo a 2-week period of system start-up and optimization. System start-up will be completed in two primary phases: a stepped-rate test and a constant-rate test. During both phases of the tests, subsurface vacuum levels will measured at vapor monitoring points (VMP-1 through VMP-6) and nearby monitoring wells that are partially screened in the vadose zone (possibly DC-1 and DC-19). Prior to initiating system start-up, baseline vacuum measurements will be collected from the monitoring locations.

A stepped-rate test will performed to evaluate system performance at a range of operating rates in order to optimize system performance. The stepped-rate test will evaluate the following:

- The relationship between applied vacuum and induced airflow;
- The relationship between applied vacuum and sustained radius of influence; and
- The vacuum that will be utilized during the constant-rate test.

The stepped-rate test will be completed in multiple phases with the applied vacuum (blower speed) increasing for each phase. At each stepped-rate test phase the following operational parameters will be collected:

- Vacuum at extraction points (inches $H_2O$);
- Air flow at extraction points (cfm);
- Vacuum at monitoring points (inches $H_2O$);
- Air flow (individual wellheads and SVE system effluent);
- Air temperature (individual wellheads and SVE system effluent); and
- VOC concentration (individual wellheads and SVE system effluent measured using Tedlar® bags and a photoionization detector [PID]).

Air flow, temperature, and VOC concentrations will also be measured at the influent to the GAC vessel, if one is used.

Following the completion of the stepped-rate test, a constant-rate test will be implemented. During the constant rate test, the optimal operation rate determined during the stepped-rate test will be evaluated over a longer operating period. The SVE system operating parameters and monitoring point vacuum data collected during the stepped-rate test will also collected during the constant-rate test. The parameters measured during the constant-rate test will be utilized to evaluate the maximum sustained area of influence that can be established during system operation, evaluate mass removal rates, and to optimize operating parameters for the SVE equipment. The constant-rate test will be completed for 24 to 72 hours to ensure that measurements equilibrate properly and that sufficient data can be collected.

After the stepped- and constant-rate tests, the optimal initial operating rate will be selected and the system will begin long-term operation. During long-term operation, vacuum and flow rate readings will be collected at the extraction wellheads, soil vapor monitoring probes, selected groundwater monitoring wells, and at the treatment system three times per week for the first two weeks. Additionally, samples of the system effluent vapor will be collected three times per week during startup to monitor treatment effectiveness.

### *3.7.2 Standard Operation*

The SVE system will be operated on a rotating SVE/air inlet basis so that half of the wells will be operated as either SVE or air inlet wells at a given time. The function of each of the wells will be manually rotated (from SVE to air inlet and vice versa) on a monthly basis. This rotating operation sequence will be conducted to maximize subsurface air flow beneath the southern paved portion of the area of impact. During initial system operation, six wells (SVE-1, SVE-3, SVE-5, SVE-7, SVE-9 and SVE-10) will be operated as SVE wells with a maximum anticipated flow rate of approximately 25 cfm per well. The remaining wells (SVE-2, SVE-4, SVE-6, and SVE-8) will operate as air inlet wells with the air inlet valve on the wellhead open (see Drawing C-4, Appendix A) to allow for ambient air to be pulled into the subsurface and drawn through the PCE-impacted area toward the operating SVE wells. On an approximate monthly basis (or other frequency determined to enhance system performance), the wells will be manually rotated so that the SVE wells become air inlet wells and the air inlet wells operate as SVE wells, with the exception of SVE-10 which will always operate as an SVE well. The function of the wells will be modified by manually opening and closing the air inlet and vacuum flow control valves on the individual wellheads. After monitoring system

performance, the rotation of the SVE/air inlet wells may be modified to optimize system performance.

During system operation, system monitoring and equipment maintenance will be performed three times weekly during the initial two weeks of operation, weekly during the following four weeks and monthly thereafter. Maintenance will also occur on an as-needed basis should any malfunctions and/or system alarms occur (see Section 2.6).

Equipment maintenance on the treatment system, including the vacuum pump, filters, GAC vessel (if used), and pumps will be conducted by a person familiar with the equipment and in accordance with manufacturer's recommendations to maintain proper equipment operation. All maintenance activities will be documented in the field book as described in Section 3.9.

The remediation system includes key maintenance items that will be completed on a routine or as-needed basis to maintain continuous operation of the system to the maximum extent practicable.

## *3.8 PERFORMANCE MONITORING*

During operation, the performance of the remediation system will be periodically assessed to evaluate whether changes to the system operation are necessary to maximize contaminant removal efficiency. Such changes can include, but are not limited to, reductions or increases in system extraction rate and conversions from an alternating operating scenario to a continuous vacuum scenario for all wells, addition of an air inlet well(s), or installation of surface vapor intrusion barrier.

During the four weeks following the initial two-week startup period, system monitoring will be conducted on a weekly basis. After that, long-term system monitoring schedule will require monthly monitoring. It is assumed that the system will operate for a period of one year, although PCE recovery progress during system operation will provide data to determine the appropriate operational duration. All system readings will be recorded in the Site field book as described in Section 3.9.

### *3.8.1 Volatile Organic Compound Mass Removal Monitoring*

Periodic vapor stream sampling and analysis will be used to evaluate the total PCE mass being recovered from soils. On a weekly to monthly basis,

depending on the length of time after startup, system effluent vapor samples will be collected and analyzed for VOCs by United States Environmental Protection Agency (USEPA) Method TO-15.

### *3.8.2 Emission Control Effectiveness Monitoring*

If a GAC treatment vessel is used, air emission control effectiveness will be evaluated by monitoring VOC concentrations in GAC vessel influent and effluent using a vacuum sample canister analyzed by USEPA Method TO-15. Removal efficiency will be evaluated by comparing the samples collected before and after the GAC vessel. The GAC vessel will be replaced with a new GAC vessel if data and observations indicate that it is no longer effectively mitigating potential odor impacts.

### *3.8.3 Groundwater Quality Monitoring*

Groundwater samples will be collected at select monitoring wells during two semiannual events to be conducted after 6 months and one year of SVE system operation to evaluate whether SVE activities are affecting PCE concentrations in groundwater. Groundwater samples will be collected from seven monitoring wells (DC-3, DC-4, DC-11, DC-13, KMW-2, KMW-9, and MW-4) and will be analyzed for halogenated VOCs by USEPA Method 8260. Groundwater sample collection procedures will be completed as described in the Data Gap Investigation Work Plan by ERM dated 14 January 2008.

### *3.8.4 Effects on Groundwater Flow*

During SVE system operation, groundwater levels will be measured in the nearby monitoring wells to evaluate whether the operation of the SVE system is having an adverse impact on the general flow direction of the shallow aquifer. In the unlikely event that an impact is noted that could adversely affect PCE distribution in groundwater, the flow rate through the blowers will be decreased as an initial response and the effect on the water table will continue to be measured.

## *3.9 DATA COLLECTION AND RECORDKEEPING*

A qualified ERM consultant will be present at the drill rig to log samples, monitor drilling operations, record soil and ground water data, monitor and record well installation procedures, and monitor and record installation of trenches and remediation system equipment. ERM

personnel will have sufficient experience and proper equipment in operable condition to efficiently perform these duties. For installation and construction activities, the consultant will be a professional engineer registered in the state of Washington or a qualified technician under the direction supervision of a professional engineer registered in the state of Washington.

The field technician will maintain a field notebook during all on-Site activities. The field notebook will be a weather-resistant, bound, survey-type field book. Entries in the field notebook will be made in ink and will include:

- Name of field personnel;
- Daily weather conditions;
- Subcontractors and vendors on Site;
- Daily activities;
- Construction techniques;
- Materials used and items installed;
- Tests and measurements performed;
- Data generated during drilling and construction activities; and
- Other applicable comments or notes.

## *3.10 SAMPLE IDENTIFICATION AND SHIPMENT*

All air and water samples collected for analysis will be properly labeled with the date, time, required analysis, and sample name based on location (e.g. MW-1, Effluent, etc.). All information listed on the sample bottles will also be listed on the chain of custody that correlates to each sample cooler. All samples submitted to the laboratory will be preserved and chilled, as required, and delivered or shipped to the analytical laboratory packed in a cooler to minimize the risk of breakage. If shipped, sample coolers will be properly packed and sealed and will include a signed custody seal to confirm the cooler was not opened during transport.

## *3.11 FIELD MEASUREMENTS*

Locations of the new SVE wells, equipment, and trenches, including all pipe elbows, tees, and valves will be measured in the field to develop "as-built" drawings of the SVE system. All field measurements will be taken with a measuring wheel, tape measure, or other means of providing accurate measurements and will be documented in the field book as described in Section 3.9. An "as-built" set of drawings will be developed based on the measurements taken in the field during construction.

## *3.12 WASTE GENERATION, TRANSPORTATION, AND DISPOSAL*

Drill cuttings, purge water, and decontamination water generated during system construction and monitoring activities will be contained in segregated 55-gallon drums. The waste drums will be clearly marked with a description of the contents and the accumulation date. The contents of each drum will be designated as Washington dangerous waste or non-dangerous waste in accordance with Washington State Dangerous Waste Regulations, Chapter 173-303 WAC. The waste will be disposed appropriately as non-dangerous or dangerous waste based on its characteristics.

When the SVE system condensate storage tank is near capacity, the water will be profiled and disposed of per Washington State Dangerous Waste Regulations, Chapter 173-303 WAC.

If required, the replacement and disposal of the carbon media in the GAC unit will be performed by a carbon vendor. The schedule for carbon replacement will be determined by monitoring the VOC concentration and odor condition at the effluent of the GAC unit. Based on an estimated flow rate of approximately 150 cfm, an estimated PCE concentration of 31 µg/L, a carbon usage of approximately 5 pounds of carbon per pound of PCE, the estimated carbon usage rate at the Site is 2.1 pounds per day. When monitoring results indicate the GAC vessel is reaching breakthrough, the spent GAC vessel will be replaced with new GAC vessel.

## *3.13 SYSTEM EFFECTIVENESS EVALUATION*

The interim action objective for the SVE program is to reduce residual PCE concentrations in soils to less than 50 µg/kg, the MTCA Method A

Soil Cleanup Level for Unrestricted Land Use. This section discusses the criteria that will be measured to evaluate the effectiveness of the remediation system operation in meeting the remedial objectives of PCE removal in soils to below the cleanup level.

Soil and groundwater samples will be collected and analyzed to evaluate progress of removal of soil dissolved-phase contamination toward the cleanup standards discussed above. Although soil cleanup is the primary objective of this IRA, results of previous remedial efforts at the Site indicate that the IRA may reduce PCE concentrations in groundwater. Therefore, semiannual sampling and analysis of groundwater will be completed at select wells to evaluate groundwater quality.

In order to eventually discontinue use of the remediation system at the Site, regulatory cleanup levels must be attained in soils across the Site. Soil sampling will be completed after PCE recovery rates in the SVE system decrease to a level that suggests that residual PCE concentrations remaining in soil are less than the MTCA Method A Cleanup Level.

Soil samples will be collected from ten borings completed in areas of PCE-impacted soil (sample locations to be identified in later report prior to collection). Eight of the borings will be completed in the vicinity of the Four Star Dry Cleaners facility at the MVSC (approximately one every 50 linear feet), and two borings will be completed in the vicinity of the former septic system on the Harris property. Up to three soil samples will be collected from each boring at depths corresponding to PCE impacts identified in nearby site investigation borings. Each of the soil samples will be analyzed for VOCs by USEPA Method 8260.

Soil sampling will be completed using a direct-push drilling rig operated by a Washington-licensed driller. Soil samples will be collected at 2.5-foot intervals for lithological logging and possible laboratory analysis. An experienced field geologist will log the soil samples, monitor the drilling activities, record the boring and sampling procedures, and prepare a log for each boring. After each boring is completed, the borehole will be abandoned in compliance with Washington requirements and grade conditions will be restored.

## *3.14 SYSTEM DECOMMISSIONING*

Once MTCA-compliant conditions are established, or it is determined that SVE operation will is no longer effectively removing PCE from Site soils,

the SVE system will be decommissioned with Ecology approval. Equipment and above-ground piping will be removed, underground piping will be capped and abandoned in place, and the wells will be decommissioned. Well decommissioning will be completed to Washington standards, and will include restoring grade conditions at each well location.

## *4.0 REPORTING*

Reports to be generated as part of the SVE program include:

- A combined Compliance Monitoring Plan/Sampling and Analysis Plan (SAP);
- A Health and Safety Plan (HASP);
- An SVE System O&M Manual;
- A System Construction and Startup Report;
- Semi-annual progress memoranda; and
- A Remedial Completion Confirmation and System Decommissioning Report.

## *4.1 COMPLIANCE MONITORING/SAMPLING AND ANALYSIS PLAN*

The combined Compliance Monitoring Plan/SAP a will be completed before the system is installed and will be applicable to the system installation and operational period. The Compliance Monitoring Plan/SAP will be developed in accordance with the applicable requirements of WAC 173-340-410 and WAC 173-340-820.

## *4.2 HEALTH AND SAFETY PLAN*

A Site-specific HASP will be developed for work anticipated at the Site. The procedures described in the HASP will be implemented by a health and safety representative during all site work. The purpose of the HASP will be to:

- Assign health and safety responsibilities to members of the project team;
- Establish safety requirements for all equipment during system construction and operation, including hazards associated with the operation of motorized equipment;
- Establish personal protective equipment requirements for project tasks;
- Provide contact information for key field and office project staff; and

- Establish emergency response procedures.

The health and safety guidelines identified in the HASP will meet the health and safety requirements of WAC 173-340-810.

## *4.3 OPERATION AND MAINTENANCE MANUAL*

The SVE System O&M Manual will be completed within one month of system startup and will include information on system operation, troubleshooting, requirements, and maintenance requirements.

## *4.4 SYSTEM CONSTRUCTION AND STARTUP REPORT*

The System Construction and Startup Report will be completed after system installation and one month of operation and will include:

- Summary of construction, monitoring, and maintenance observations;
- "As-built" construction drawings;
- Operational information on the SVE system performance;
- Permitting information and permit compliance program details.

## *4.5 INTERIM REMEDIAL PROGRESS REPORTS*

Brief monthly monitoring reports will be completed to present a summary of the monitoring and maintenance activities for the month, the ongoing system operational parameters, results of any laboratory results, and general progress towards the project objective.

Remedial progress monitoring memoranda will be completed semi-annually after system startup and will summarize system operation details, field work completed, sample results, and observations for the previous three months of system operation. Each memorandum will include both vapor monitoring and groundwater sampling results. Each memorandum will also include an evaluation of PCE recovery rates and discussion of remedial effectiveness and projected progress toward meeting soil cleanup standards. The final memorandum will include a recommendation for cessation of SVE system operation based on PCE recovery rates and soil sampling results from borings planned to confirm

remedial compliance. Semi-annual progress reports are planned for the duration of system operation.

## *4.6 REMEDIAL COMPLETION CONFIRMATION AND SYSTEM DECOMMISSIONING REPORT*

At the end of SVE system operation, ERM will prepare and submit a Remedial Completion Confirmation and System Decommissioning Report. This report will, as part of the evaluation of effectiveness of the cleanup action, include the following:

- Summary of system operation;
- A summary of soil boring data developed to confirm compliance with the PCE cleanup level in soil;
- Detailed rationale for establishing regulatory compliance for PCE in soil, or a demonstration of system ineffectiveness if remedial action goals are not met; and
- System decommissioning and site restoration information.

Note that the site owners anticipate providing appropriate information to Ecology through the Voluntary Cleanup Program to support the decision to terminate SVE operations, and will confirm Ecology concurrence with that plan prior to commencing SVE system decommissioning activities.

## *5.0 REFERENCES*

ERM, 2008a. Data Gap Investigation Work Plan. 14 January 2008.

ERM, 2008b. Draft Data Gap Investigation Report. December 2008.

Farallon, 2004. Farallon Consulting. Dry Cleaner Monitoring Results – November 2004. 29 December 2004.

SCS Engineers 2000. Voluntary Cleanup Program Soil Remediation Report, Soil Vapor Extraction PCE Remediation Project, Four Star Dry Cleaners Site, Manhattan Village Shopping Center. October 2000.

*Figures*

Project No. 0075720.00

Date: 11/17/08

Drawn By: R.O./C.T.

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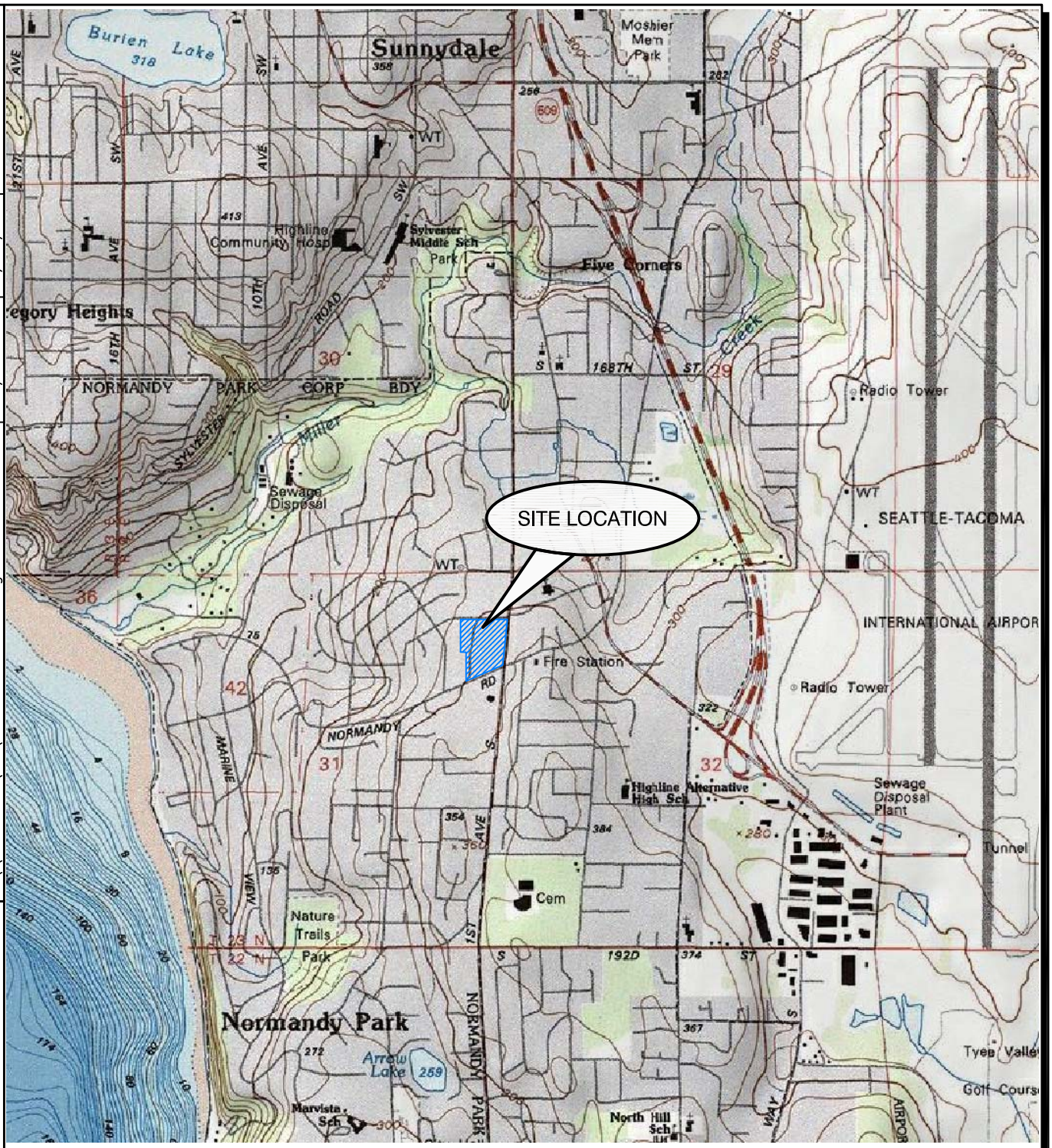


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References:
TOPO!® Software
U.S.G.S. 7.5 Minute Series (Topographic) Quadrangle, Des Moines, WA
Version: 1995; Current: 1990

Figure 1
*Site Location Map*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM *11/08*

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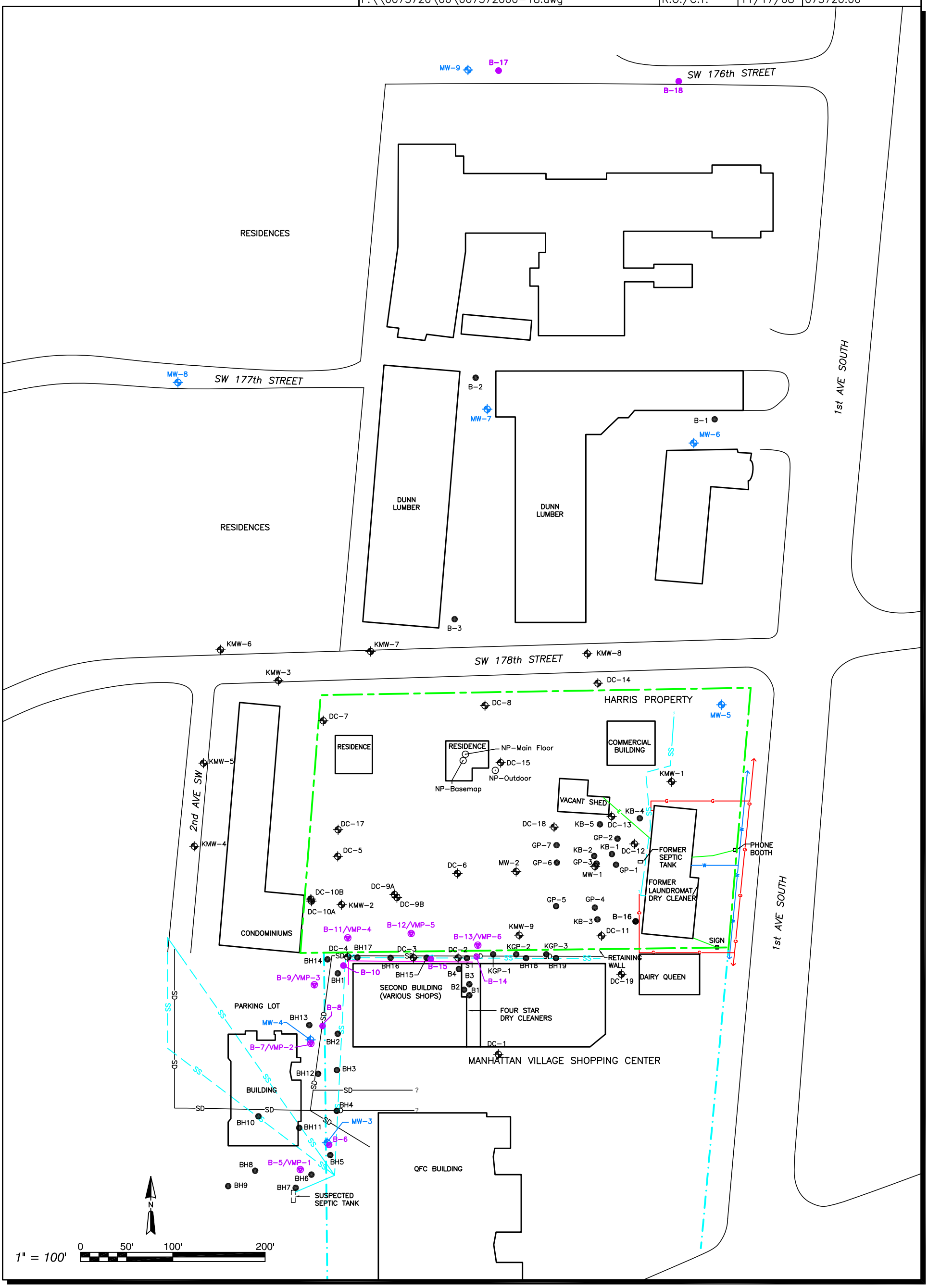


LEGEND

- Monitoring Well
- Soil Boring
- Soil Vapor Extraction Well
- Domestic Well
- Storm Water Catch Basin
- Monitoring Well, Installed 2008
- Soil Boring, Completed 2008
- Soil Vapor Probe, Installed 2008
- Air Sample, Collected 2008

- Approximate Harris Property Boundary
- Approximate Manhatten Plaza Shopping Center Property Boundary
- Underground Electrical Utility
- Underground Natural Gas Utility
- Underground Sewer Utility
- Underground Storm Drain Utility
- Underground Water Utility

Figure 2
*Site Plan*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM 11/08

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N

1" = 100'

0 50' 100' 200'

B-17

B-18

SW 176th STREET

RESIDENCES

SW 177th STREET

1st AVE SOUTH

B-2

B-1

DUNN LUMBER

DUNN LUMBER

RESIDENCES

WATER SUPPLY WELL

B-3

SW 178th STREET

2nd AVE SW

HARRIS PROPERTY

RESIDENCE

RESIDENCE

COMMERCIAL BUILDING

WELL HOUSE

VACANT SHED

SVS-6 SVS-3 SVS-2

KB-4 KB-5 KB-2 KB-1 SVS-4 SVS-5

GP-7 GP-2 GP-6 GP-3 GP-1

FORMER SEPTIC TANK

PHONE BOOTH

SVS-1

FORMER LAUNDROMAT/ DRY CLEANER

GP-5 GP-4 KB-3 B-16

SVS-7 SVS-8 SVS-9 SIGN

KGP-1 KGP-2 KGP-3

RETAINING WALL

FORMER DAIRY QUEEN

CONDOMINIUMS

B-11 B-12 B-14 B-13 B-15 B-10 B-6

BH17 BH14 BH16 BH15 BH18 BH19

B-10 S1

B4 B3 B2 B1

SECOND BUILDING (VARIOUS SHOPS)

FOUR STAR DRY CLEANERS

PARKING LOT

BH13 BH1 BH2 B-9 B-8 B-7 BH12 BH3 BH4 BH10 BH11 B-6 B-5 BH8 BH6 BH5 BH9 BH7

BUILDING

SUSPECTED SEPTIC TANK

MANHATTAN VILLAGE SHOPPING CENTER

QFC BUILDING

| B-12 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/27/08 | 10' | ND |
| | 20' | 2.99 |
| | 30' | 8.48 |

| B-13 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/27/08 | 10' | 31.1 |
| | 20' | 31.4 |
| | 30' | 23.1 |

| B-11 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/27/08 | 10' | 32.4 |
| | 20' | 346 |
| | 30' | 279 |

| B-9 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/25/08 | 10' | 6.16 |
| | 20' | 14.3 |
| | 30' | 11.6 |

| B-16 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/25/08 | 10' | ND |
| | 20' | ND |
| | 30' | ND |

| B-8 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/26/08 | 10' | 6.54 |
| | 20' | 5.54 |
| | 30' | 5.62 |

| B-14 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/24/08 | 10' | 11.8 |
| | 20' | 29.6 |
| | 30' | 594 |

| B-7 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/25/08 | 10' | ND |
| | 20' | 3.51 |
| | 30' | 8.84 |

| B-15 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/24/08 | 10' | 5.32 |
| | 20' | 18.8 |
| | 30' | 7.85 |

| B-5 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/26/08 | 10' | ND |
| | 20' | 3.4 |
| | 30' | 8.88 |

| B-10 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/24/08 | 10' | 671 |
| | 20' | 50.8 |
| | 30' | 15.4 |

| B-6 | | |
|---|---|---|
| Date | Depth | VOCs |
| 03/25/08 | 10' | ND |
| | 20' | 8.16 |
| | 30' | 8.99 |

LEGEND

- Existing Soil Boring
- Soil Boring, Completed 2008
- 32.4 — PCE Concetration (µg/kg)
- 279 — PCE Concentration Above the Cleanup Standard (50 µg/kg)
- Inferred Impacted Soil Boundary, April 2008 Data
- Inferred Impacted Soil Boundary, April 2005 Data
- Approximate Harris Property Boundary
- Approximate Manhattan Village Shopping Center Property Boundary
- Underground Electrical Utility
- Underground Natural Gas Utility
- Underground Sewer Utility
- Underground Storm Drain Utility
- Underground Water Utility

Figure 3

*Tetrachloroethene in Soil*

*MVSC/Harris Properties*

*Normandy Park, Washington*

ERM 12/08

# *Appendix A*
# *Construction Drawings*

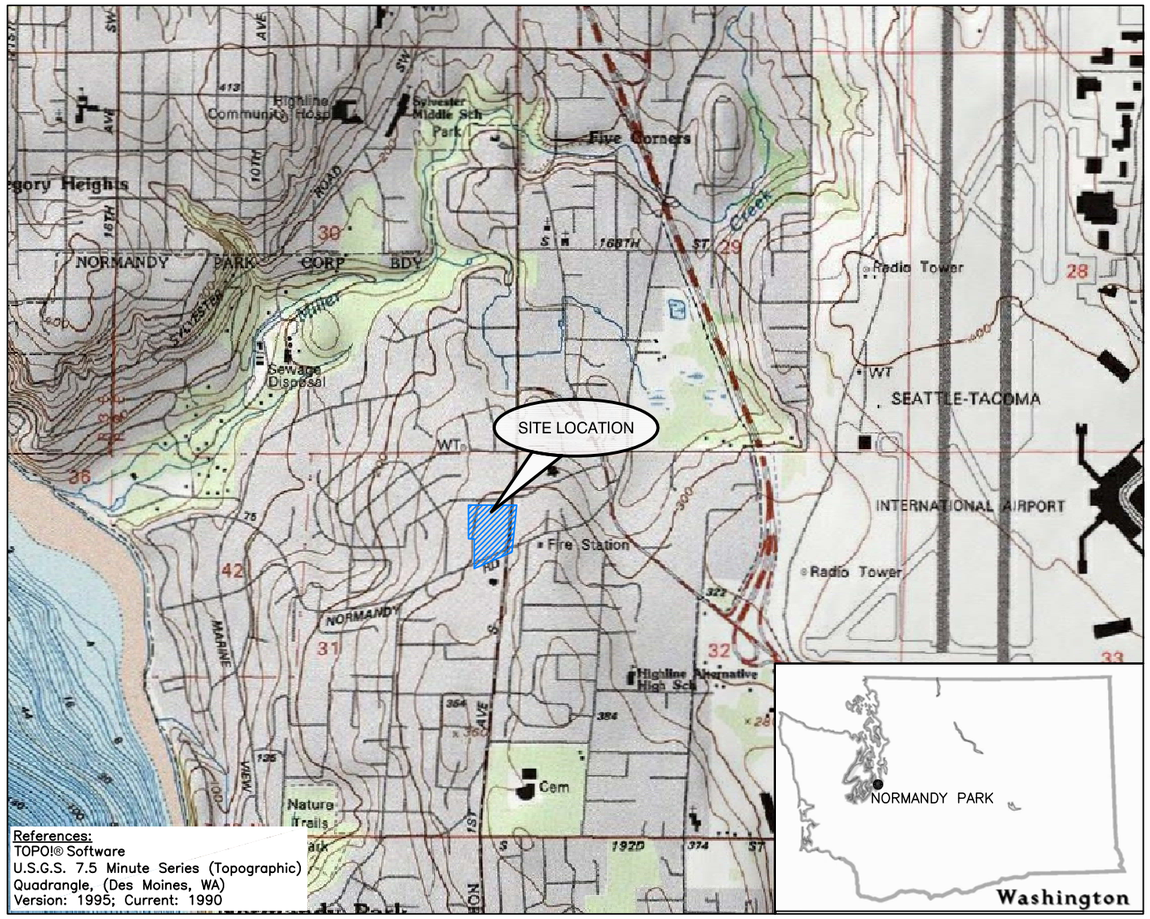
# MANHATTAN VILLAGE SHOPPING CENTER (MVSC)/HARRIS PROPERTIES

NORMANDY PARK, WASHINGTON

# SOIL VAPOR EXTRACTION SYSTEM REMEDIAL DESIGN

MARCH 2009

## *LOCATION MAP*

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## *INDEX OF DRAWINGS*

| *DRAWING NO.* | *DISC. NO.* | *DESCRIPTION* |
|---|---|---|
| 0092621-01 | T-1 | SITE LOCATION MAP AND INDEX OF DRAWINGS |
| 0092621-02 | G-1 | GENERAL NOTES |
| 0092621-03 | C-1 | RADIUS OF INFLUENCE |
| 0092621-04 | C-2 | SITE AND SYSTEM LAYOUT |
| 0092621-05 | C-3 | PIPING AND INSTRUMENTATION DIAGRAM |
| 0092621-06 | C-4 | WELL CONSTRUCTION DETAILS |
| 0092621-07 | C-5 | PIPING AND TRENCH DETAILS |

| REV | DATE | REVISION | APPR'D | REV BY |
|---|---|---|---|---|
| | | | | |

ERM

SITE LOCATION MAP AND INDEX OF DRAWINGS — REV

| SCALE | DESIGNED BY | DRAWN BY | DRAWING NUMBER | SHEET |
|---|---|---|---|---|
| AS NOTED | O. WILLIAMS, P.E. | C.TALLADA | 0092621-01 | 1 of 7 |
| DATE | CHECKED | APPROVED | JOB NUMBER | |
| 03/02/09 | E. IPSEN, P.E. | | 0092621-01 | |

MVSC / HARRIS PROPERTIES
NORMANDY PARK, WASHINGTON

DISCIPLINE NO. T-1

ENVIRONMENTAL RESOURCES MANAGEMENT

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## PIPING AND INSTRUMENTATION

- SAMPLE PORT
- HAND OPERATED VALVE
- TEE WITH CAP
- PI — PRESSURE INDICATOR
- LS — LOW LEVEL SWITCH
- LSH — HIGH LEVEL SWITCH
- LSHH — HIGH–HIGH LEVEL SWITCH
- FIQ — FLOW INDICATOR/QUANTIFIER

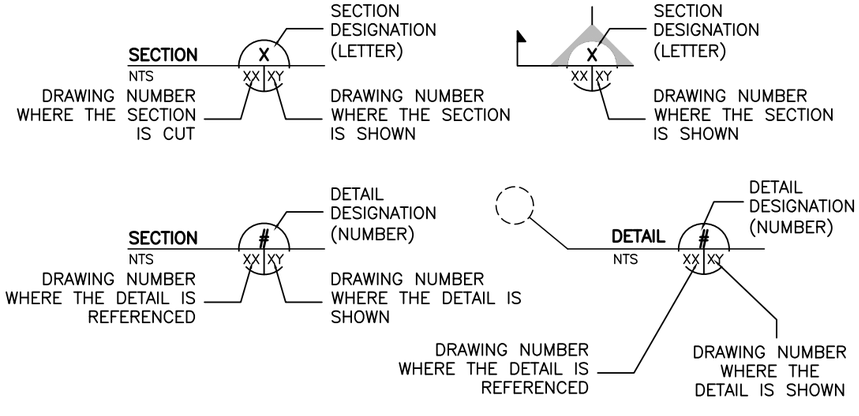
## PLAN SYMBOLS

- EXISTING MONITORING WELL
- PROPOSED SOIL VAPOR EXTRACTION WELL
- VAPOR MONITORING PROBE
- UNDERGROUND FUTURE AIR SPARGE PIPING
- CHAIN LINK FENCE
- ABOVEGROUND SVE PIPING
- UNDERGROUND SVE PIPING
- INFERRED IMPACTED SOIL BOUNDARY, GREATER THAN 50 µg/kg, APRIL 2008
- INFERRED IMPACTED SOIL BOUNDARY, GREATER THAN 50 µg/kg, APRIL 2005
- APPROXIMATE HARRIS PROPERTY BOUNDARY
- APPROXIMATE MANHATTAN VILLAGE SHOPPING CENTER PROPERTY BOUNDARY
- E — UNDERGROUND ELECTRICAL UTILITY
- G — UNDERGROUND NATURAL GAS UTILITY
- SS — UNDERGROUND SANITARY SEWER UTILITY
- SD — UNDERGROUND STORM DRAIN UTILITY
- W — UNDERGROUND WATER UTILITY

- RADIUS OF INFLUENCE, EST 50'
- ASPHALT PAVEMENT
- AGGREGATE, GRANULAR MATERIAL
- CONCRETE
- NOMINALLY COMPACTED BACKFILL
- SAND
- TOPSOIL
- CEMENT–BENTONITE GROUT
- HYDRATED BENTONITE CHIPS

## ABBREVIATIONS

| | |
|---|---|
| ø | DIAMETER |
| µg/kg | MICROGRAMS PER KILOGRAM |
| ' | FOOT, FEET |
| " | INCHES |
| APPROX | APPROXIMATE |
| AVE | AVENUE |
| EL | ELEVATION |
| EST | ESTIMATED |
| MIN | MINIMUM |
| MVSC | MANHATTAN VILLAGE SHOPPING CENTER |
| NTS | NOT TO SCALE |
| S | SOUTH |
| SVE | SOIL VAPOR EXTRATION |
| PCE | TETRACHLOROETHENE |
| PSI | POUNDS PER SQUARE INCH |
| PVC | POLYVINYL CHLORIDE |
| SCFM | STANDARD CUBIC FEET PER MINUTE |
| SCH | SCHEDULE |
| SVE | SOIL VAPOR EXTRACTION |
| SW | SOUTHWEST |
| TYP | TYPICAL |
| WC | WATER COLUMN |




## GENERAL NOTES

1. LOCATIONS SHOWN FOR EXISTING UTILITIES AND OTHER SITE FEATURES ARE APPROXIMATE AND WERE COMPILED FROM INFORMATION PROVIDED BY PREVIOUS DESIGN PLANS, LIMITED FIELD SURVEY, AND SITE VERIFICATION.
2. FIELD LOCATE EXISTING UTILITIES TO DETERMINE EXTENT OF PROTECTION REQUIRED AND/OR CHANGES THAT MAY BE REQUIRED. USE CARE WHEN EXCAVATING OR DRILLING NEAR UTILITIES.
3. UTILITY LOCATES: CALL MINIMUM 5 DAYS AND MAXIMUM 10 DAYS BEFORE EXCAVATION OR DRILLING. 1–800–424–5555 OR 811.
4. CONSTRUCTION AREA SHALL BE SECURED AGAINST UNAUTHORIZED ENTRY DUING DURATION OF PROJECT.

## CONSTRUCTION NOTES

1. ASPHALT AND CONCRETE SURFACES SHALL BE SAWCUT IN A STRAIGHT LINE PRIOR TO REMOVAL FOR TRENCHING OR DRILLING.
2. UTILITY TRENCHES SHALL BE EXCAVATED A MINIMUM OF 3 INCHES DEEPER THAN THE BOTTOM OF INSTALLED PIPE. ALL LINES SHALL HAVE A MINIMUM OF 12 INCHES OF COMPACTED SAND AND A MINIMUM BURIAL DEPTH OF 36 INCHES UNLESS OTHERWISE NOTED.
3. TRENCHES SHALL BE BACKFILLED WITH CLEAN SAND WITH A MAXIMUM LOOSE LIFT OF 8 INCHES BEFORE COMPACTION. COMPACTION SHALL BE TO A DENSITY OF NO LESS THAN 95% OF MAXIMUM.
4. WARNING TAPE SHALL BE INSTALLED IN ALL TRENCH BACKFILL AT LEAST 6 INCHES ABOVE THE UPPERMOST PIPING.
5. SURFACING MATERIALS SHALL MATCH SURROUNDINGS UNLESS OTHERWISE NOTED.
6. ALL ELECTRICAL PANELS, METERS, CONDUIT, AND PIPING IN TREATMENT AREA SHALL BE MOUNTED A MINIMUM OF 36 INCHES ABOVE GRADE. ALL PANELS, METERS, CONDUIT AND PIPING SHALL BE MOUNTED ON UNISTRUT ON 2–FOOT CENTERS.
7. EXTREME CAUTION SHALL BE TAKEN TO PREVENT DAMAGE TO MONITORING WELLS AND OTHER EXISTING SITE FEATURES DURING CONSTRUCTION.
8. PVC PIPE SHALL BE PRESSURE TESTED TO A MINIMUM OF 75 PSI PRIOR TO BACKFILLING AND/OR USE.

| REV | DATE | REVISION | APPR'D | REV BY |
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GENERAL NOTES

REV

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|---|---|---|---|
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SHEET 2 of 7

MVSC / HARRIS PROPERTIES
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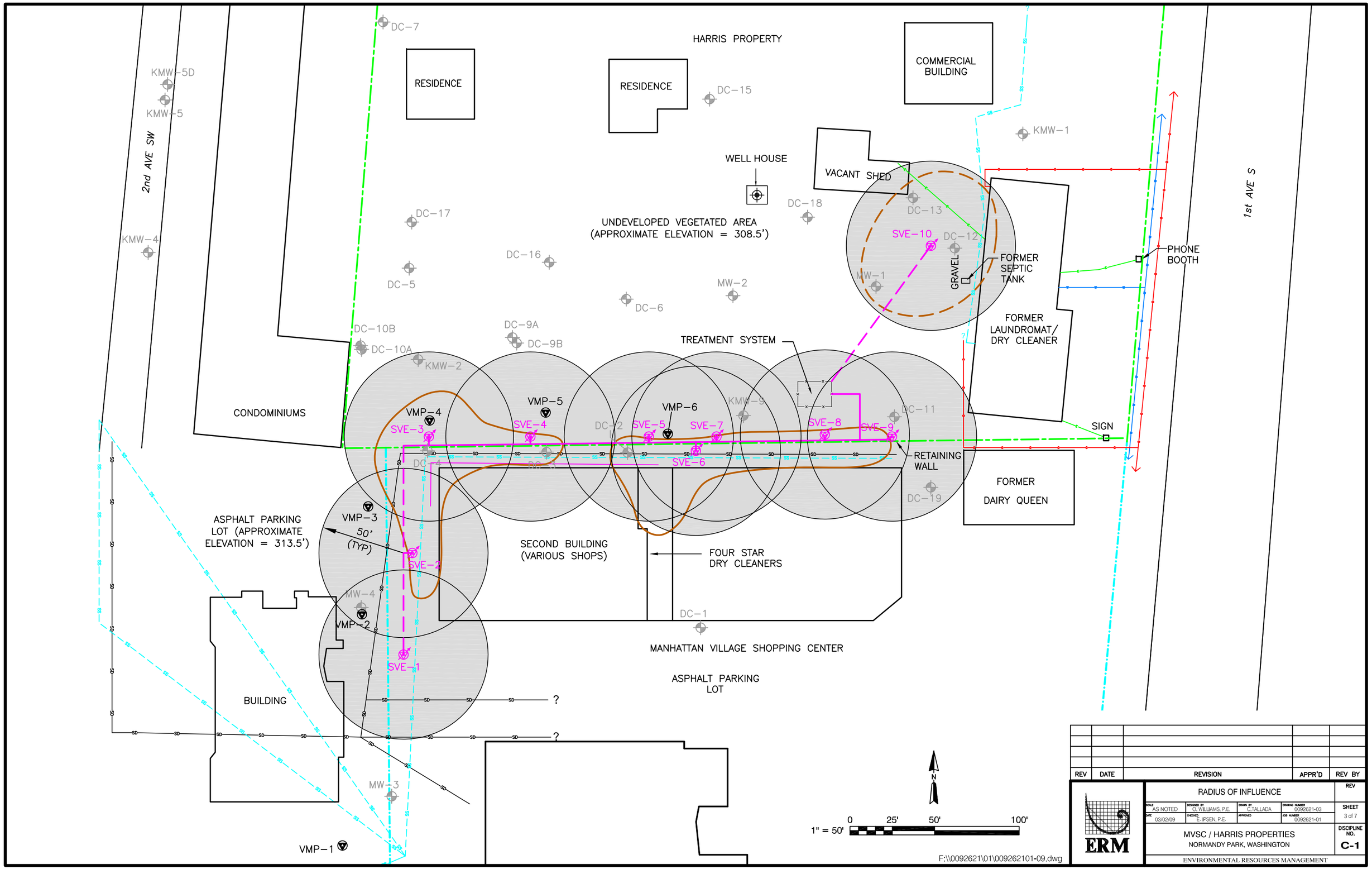
DISCIPLINE NO. G-1

ENVIRONMENTAL RESOURCES MANAGEMENT

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RADIUS OF INFLUENCE

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| AS NOTED | O. WILLIAMS, P.E. | C.TALLADA | 0092621-03 |
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SHEET 3 of 7

MVSC / HARRIS PROPERTIES
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DISCIPLINE NO. C-1

ENVIRONMENTAL RESOURCES MANAGEMENT

DC-7
HARRIS PROPERTY
RESIDENCE
RESIDENCE
COMMERCIAL BUILDING
KMW-5D
KMW-5
DC-15
KMW-1
2nd AVE SW
WELL HOUSE
VACANT SHED
DC-18
DC-13
DC-17
UNDEVELOPED VEGETATED AREA
(APPROXIMATE ELEVATION = 308.5')
SVE-10
DC-12
KMW-4
2"ø SCH 40
PVC PIPE
GRAVEL
FORMER
SEPTIC
TANK
PHONE
BOOTH
DC-16
DC-5
MW-2
MW-1
DC-6
FORMER
LAUNDROMAT/
DRY CLEANER
DC-9A
DC-10B
KMW-2
DC-9B
DC-10A
TREATMENT SYSTEM
(SEE SHEET C-3)
C
C-2 C-5
1
C-2 C-4
D
C-2 C-5
B
C-2 C-5
6"ø SCH 40
PVC PIPE
15.0'
20.0'
DC-11
CONDOMINIUMS
VMP-4
6"x6"x2"
PVC TEE
VMP-5
VMP-6
SVE-7
KMW-9
SVE-8
SVE-3
SVE-4
SVE-5
SVE-9
SIGN
DC-4
SVE-6
RETAINING
WALL
DC-3
DC-2
A
C-2 C-5
DC-19
FORMER
DAIRY QUEEN
ASPHALT PARKING
LOT (APPROXIMATE
ELEVATION = 313.5')
VMP-3
2"ø SCH 40
PVC PIPE
SECOND BUILDING
(VARIOUS SHOPS)
FOUR STAR
DRY CLEANERS
SVE-2
MW-4
VMP-2
DC-1
MANHATTAN VILLAGE SHOPPING CENTER
SVE-1
ASPHALT PARKING
LOT
BUILDING
?
?
MW-3
VMP-1
1st AVE S
N
0 25' 50' 100'
1" = 50'
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SITE PLAN AND SYSTEM LAYOUT

REV

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SHEET 4 of 7

MVSC / HARRIS PROPERTIES
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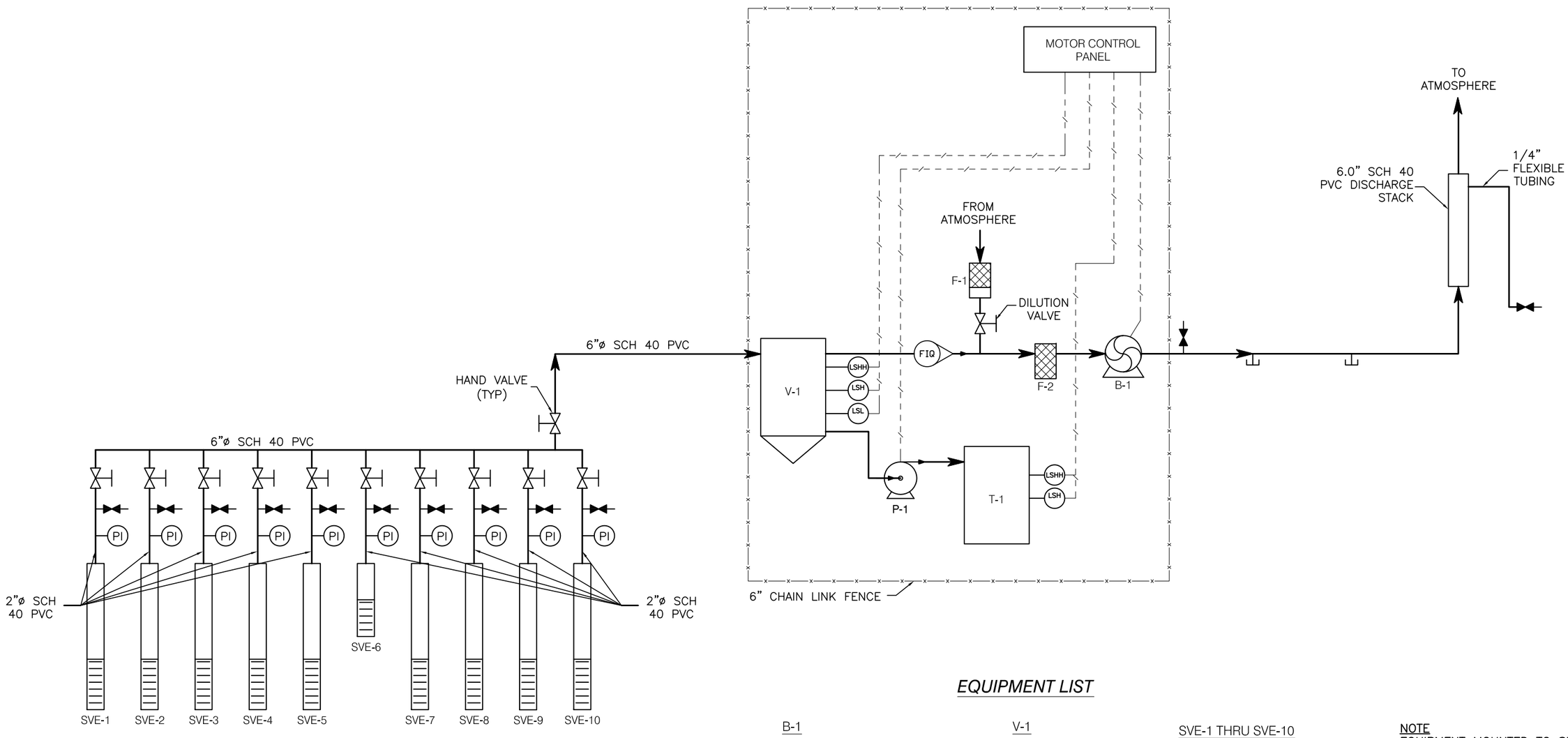
DISCIPLINE NO. C-2

ENVIRONMENTAL RESOURCES MANAGEMENT




## *EQUIPMENT LIST*

B-1

VACUUM EXTRACTION BLOWER
VARIABLE SPEED DRIVE
POSITIVE DISPLACEMENT
150 SCFM @ 60" WC

F-1

SUPPLEMENTAL AIR FILTER
INLINE CARTRIDGE

F-2

SOIL GAS FILTER
INLINE CARTRIDGE

P-1

AIR WATER SEPARATOR PUMP

V-1

KNOCK–OUT TANK

T-1

200–GALLON POLYTHETHYLENE TANK

SVE-1 THRU SVE-10

SOIL VAPOR EXTRACTION WELL
2" DIAMETER

NOTE
EQUIPMENT MOUNTED TO SKID

| REV | DATE | REVISION | APPR'D | REV BY |
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PIPING AND INSTRUMENTATION DIAGRAM

REV

| SCALE | DESIGNED BY | DRAWN BY | DRAWING NUMBER | SHEET |
|---|---|---|---|---|
| AS NOTED | O. WILLIAMS, P.E. | C.TALLADA | 0092621-05 | 5 of 7 |
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NORMANDY PARK, WASHINGTON

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ENVIRONMENTAL RESOURCES MANAGEMENT

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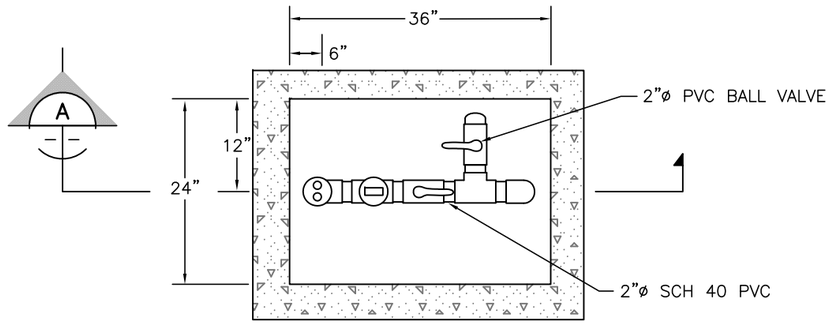
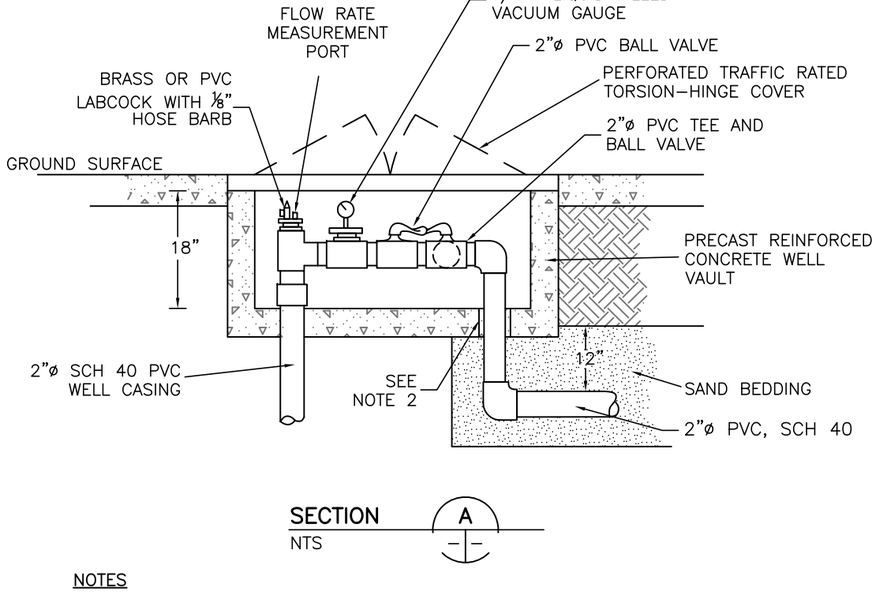



## SOIL VAPOR EXTRACTION WELL VAULT

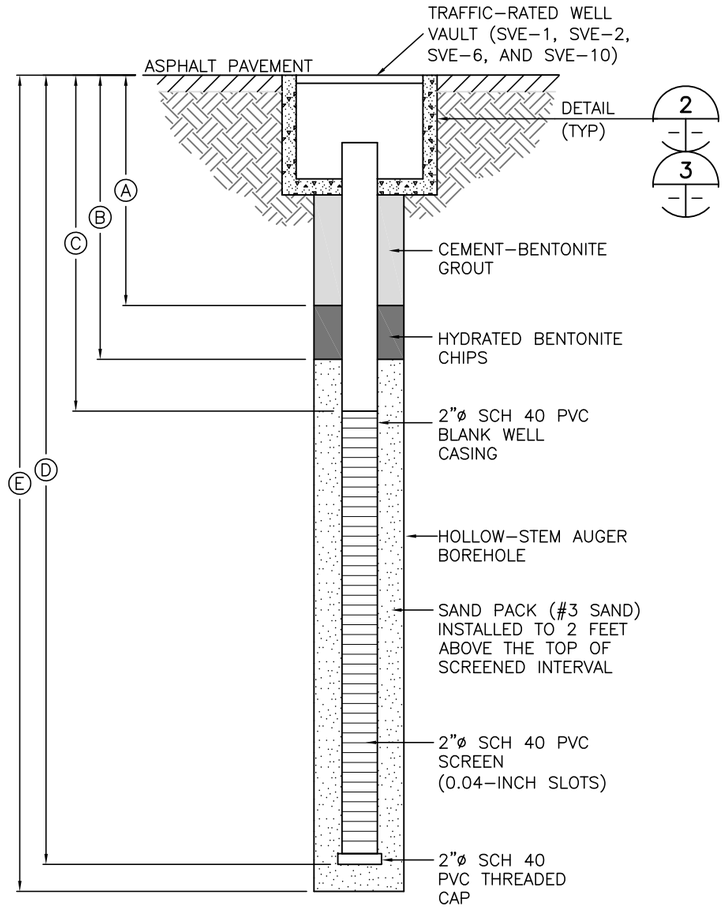
DETAIL 2
NTS

NOTE
TYP FOR WELLS SVE–1, SVE–2, SVE–6 AND SVE–10.




SECTION A
NTS

NOTES
1. AT SVE–10, SET VAULT 2" ABOVE GROUND SURFACE AND GRADE TO DRAIN AWAY FROM VAULT.
2. DRILL 4"ø HOLE FOR VAPOR DISCHARGE PIPE TO ALLOW FOR DRAINAGE FROM VAULT.

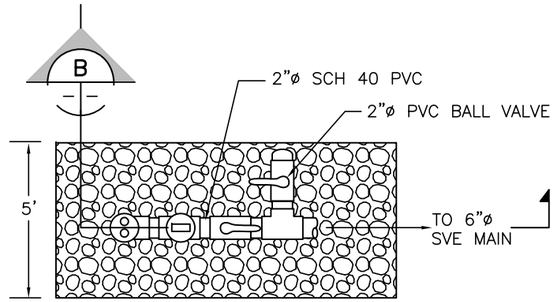



## SOIL VAPOR EXTRACTION WELL

DETAIL 1
NTS C–2 | C–4

NOTES
1. SEE TABLE 1, THIS SHEET FOR SVE WELL DIMENSIONS.
2. WELL VAULT REQUIRED FOR WELLS SVE–1, SVE–2, SVE–6, AND SVE–10 (SEE SECTION A ON THIS SHEET). ALL OTHER SVE WELLS TO FINISH ABOVE GRADE (SEE SECTION B ON THIS SHEET).

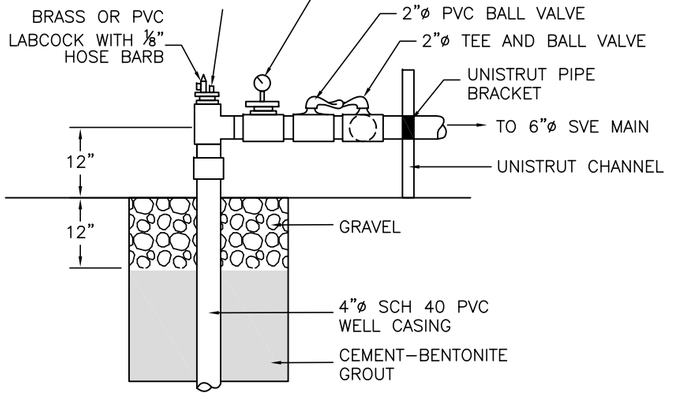
| TABLE 1: SVE WELL DIMENSIONS (FEET) | | | | | |
|---|---|---|---|---|---|
| WELL | Ⓐ | Ⓑ | Ⓒ | Ⓓ | Ⓔ |
| SVE–1 | 6 | 8 | 10 | 35 | 35.5 |
| SVE–2 | 6 | 8 | 10 | 35 | 35.5 |
| SVE–3 | 6 | 8 | 10 | 30 | 30.5 |
| SVE–4 | 6 | 8 | 10 | 30 | 30.5 |
| SVE–5 | 6 | 8 | 10 | 30 | 30.5 |
| SVE–6 | 2.5 | 4 | 5 | 10 | 10.5 |
| SVE–7 | 6 | 8 | 10 | 30 | 30.5 |
| SVE–8 | 6 | 8 | 10 | 30 | 30.5 |
| SVE–9 | 6 | 8 | 10 | 30 | 30.5 |
| SVE–10 | 6 | 8 | 10 | 30 | 30.5 |




## ABOVE GROUND SOIL VAPOR EXTRACTION WELL HEAD

DETAIL 3
NTS

NOTE
TYP FOR WELLS SVE–3 THROUGH SVE–9 EXCEPT SVE–6.




SECTION B
NTS

| REV | DATE | REVISION | APPR'D | REV BY |
|---|---|---|---|---|
| | | | | |

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WELL CONSTRUCTION DETAILS — REV

| SCALE | DESIGNED BY | DRAWN BY | DRAWING NUMBER |
|---|---|---|---|
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SHEET 6 of 7

MVSC / HARRIS PROPERTIES
NORMANDY PARK, WASHINGTON

DISCIPLINE NO. C-4

ENVIRONMENTAL RESOURCES MANAGEMENT

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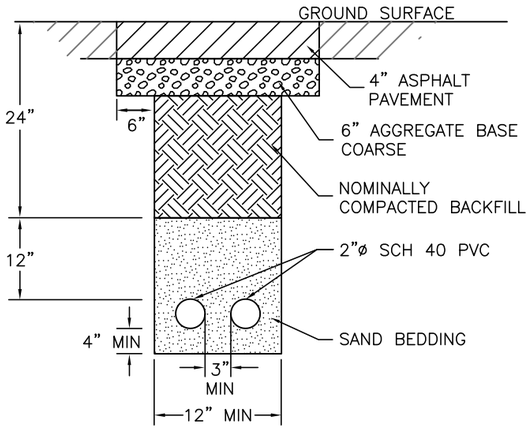
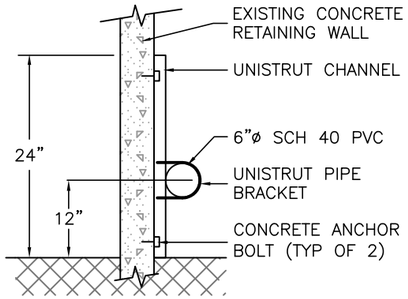



## BRANCH TRENCH (PAVED)

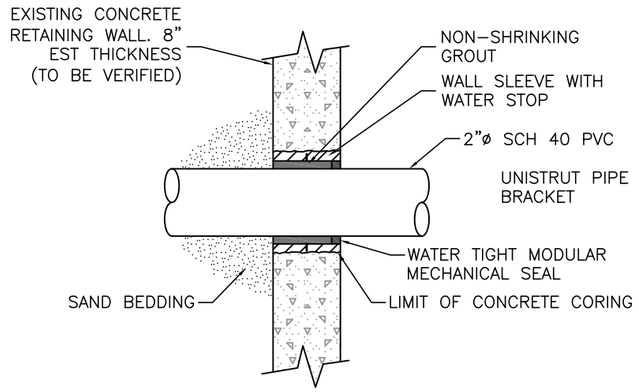
SECTION A — NTS — C-2 | C-5




## SVE HEADER

SECTION B — NTS — C-2 | C-5

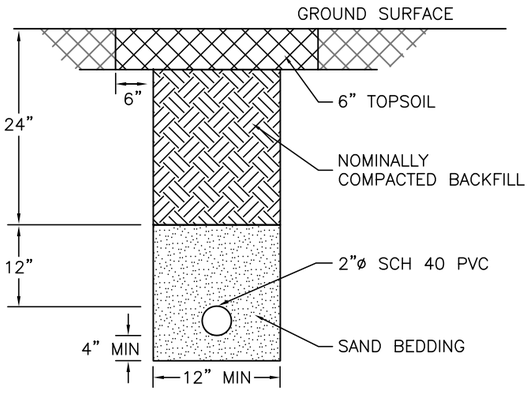
NOTE:
SUPPORT 6"ø PIPE EVERY 6 FEET HORIZONTALLY.




## RETAINING WALL PENETRATION

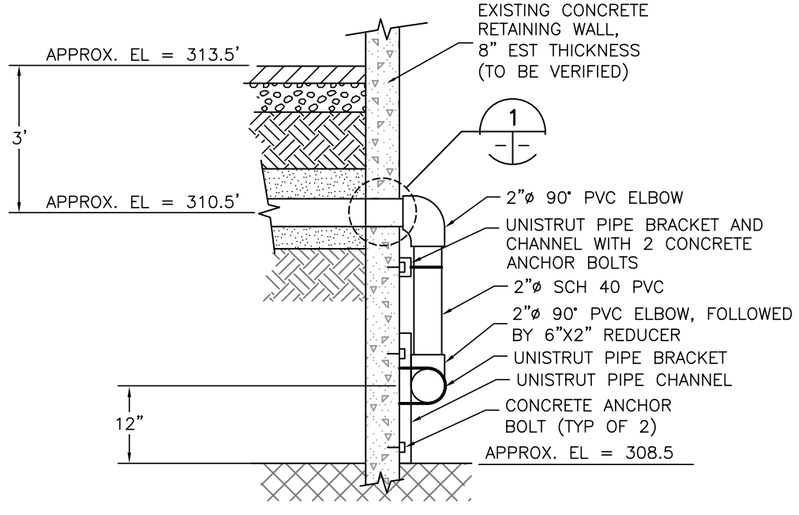
DETAIL 1 — NTS

NOTE
CONCRETE RETAINING WALL PENETRATIONS REQUIRED FOR CONNECTING SVE-1/SVE-2 AND SVE-6 TO 6"ø HEADER LINE AND FUTURE AIR SPARGE CONNECTION PIPE.




## BRANCH TRENCH

SECTION C — NTS — C-2 | C-5




## SVE HEADER TO SVE-1/SVE-2 AND SVE-6

SECTION D — NTS — C-2 | C-5

NOTES
1. ELEVATIONS ARE APPROXIMATE AND WILL BE VERIFIED PRIOR TO CONSTRUCTION.
2. CAP 2"ø SCH 40 PVC AIR SPARGE PIPE (BEHIND PIPE SHOWN IN SECTION) AFTER 90° ELBOW DOWN.

| REV | DATE | REVISION | APPR'D | REV BY |
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PIPING AND TRENCH DETAILS — REV

| SCALE | DESIGNED BY | DRAWN BY | DRAWING NUMBER | SHEET |
|---|---|---|---|---|
| AS NOTED | O. WILLIAMS, P.E. | C.TALLADA | 0092621-07 | 7 of 7 |
| DATE | CHECKED | APPROVED | JOB NUMBER | |
| 03/02/09 | E. IPSEN, P.E. | | 0092621-01 | |

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NORMANDY PARK, WASHINGTON

DISCIPLINE NO. C-5

ENVIRONMENTAL RESOURCES MANAGEMENT

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# *Appendix B*
# *Design Calculations*

**Environmental Resources Management**

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(425) 462-8591 • Fax (425) 455-3573

Project Normandy Park SVE Design | Project No. 92621 | Sheet 1 of 4
Subject ESTIMATED FLOW RATE | By O. Williams | Date
Chkd. by | Date

## Assumptions

- 10 SVE wells, operating 1/2 wells at a time
- Vadose zone thickness = 20' for (screen length) 25' for 5' for one well
- Soil porosity = 0.25 (estimated, silty sands)
- ROI = 50' (estimated based on previous SVE system onsite)
- 2 pore volume air exchanges/day (estimated)

## CALCULATIONS:

Airflow (per well) = $Q_v = \frac{\pi r^2 bn}{t}$

Where: r = ROI (ft)
b = vadose zone thickness (ft)
n = porosity
t = pore volume exchange time (days)

$$Q_v = \frac{(50^2\ ft^2)(20\ ft)(0.25)}{(0.5\ day)(24\ hr/day)(60\ \frac{min}{hr})}$$

$Q_{v,\ 20ft} = 54.5$ cfm/well

$Q_{v,\ 25ft} = 68.2$ cfm/well

$Q_{v,\ 5ft} = 13.6$ cfm

$Q_{TOTAL,\ AVE\ (6\ wells)} = 5(54.5\ cfm) + 68.2\ cfm = \underline{340\ cfm}$

$Q_{TOTAL,\ MAX\ (10\ wells)} = 7(54.5) + 2(68.2) + 13.6 = \underline{532\ cfm}$

Notes: Estimated that Qv will not exceed 25 cfm to prevent collection of air not laden with VOCs (overstripping)

Monthly well rotation includes: Group 1 - SVE-1, 3, 5, 7, 9, 10
Group 2 - SVE-2, 4, 6, 8, 10

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Project Normandy Park SVE Design | Project No. 92621 | Sheet 2 of 4
Subject PCE MASS REMOVAL | By O.Williams | Date
Chkd. by | Date

## Assumptions:

- Ave air flow rate = 150 cfm (estimated)
  (6 wells operating @ 25 cfm)
- Max PCE concentration = 52 ug/L (52,000 ug/m³)
  (2004 Farallon vapor sampling)
- Ave PCE concentration = 30.65 ug/L (30,650 ug/m³)
  (average of 4 vapor samples between 2003 & 2004)

## CALCULATIONS:

Daily Mass Removal = Flow × Concentration

$$= 150 \text{ cfm}\left(\frac{1\text{ m}^3}{35.31\text{ ft}^3}\right)\left(\frac{52{,}000\text{ ug}}{\text{m}^3}\right)\left(\frac{1\text{ g}}{10^6\text{ ug}}\right) \times \left(\frac{1\text{ lb}}{453.6\text{ g}}\right)\left(\frac{60\text{ min}}{\text{hr}}\right)\left(\frac{24\text{ hr}}{\text{day}}\right)$$

Daily Mass Removal (Max) = **0.701 lbs PCE/day (max)**

Daily Mass Removal (ave) = **0.413 lbs PCE/day (ave)**

Annual Mass Removal = $0.701 \frac{\text{lbs}}{\text{day}} \times 365 \frac{\text{days}}{\text{yr}} = 256 \frac{\text{lbs PCE}}{\text{yr}}$ (Max)

$0.413 \frac{\text{lbs}}{\text{day}} \times 365 \frac{\text{days}}{\text{yr}} = 151 \frac{\text{lbs PCE}}{\text{yr}}$ (Ave)

Note: Vapor concentrations expected to decrease during SVE operation so mass removed will likely be less than calculated value.

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CARBON USE CALCS

Project Normandy Park SVE Design | Project No. 92621 | Sheet 3 of 4
Subject | By O. Williams | Date 3/1/09
Chkd. by | Date

## Assumptions:

- Ave air flow = 150 cfm
  (6 wells @ 25 cfm)
- PCE GAC adsorption: good = 30%. (1 lb PCE/3.33 lb GAC)
  conservative = 20%. (1 lb PE/5 lb GAC)
- Ave daily PCE mass removal = 0.413 lbs PCE
  (based on previous calcs)
- GAC unit = 400 lbs

## CALCULATIONS:

$0.413 \text{ lbs PCE/day} \times \frac{5 \text{ lbs GAC}}{1 \text{ lb PCE}} = 2.07 \text{ lbs GAC/day}$

$30 \text{ days} \times 2.07 \text{ lbs/day} = 62.0 \text{ lbs GAC/month}$

$400 \text{ lb GAC vessel} / 62 \frac{\text{lbs}}{\text{month}} = 6.45 \text{ month replacement period}$

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Project Normandy Park SVE Design | Project No. 92621 | Sheet 4 of 4
Subject CONDENSATE GENERATION (Worst case, winter months) | By O. Williams | Date
Chkd. by | Date

## Assumptions:

- Relative humidity = 100% (conservative)
- Average extracted vapor temperature = 55°F (286K)
- Pressure in Ko tank = 0.15 atm (60" WC vacuum)
- Average winter air temperature = 35°F (275K)
- Concentration of water vapor @ 286 K & 100% RH = 8.86 E-3 kg/kg air
- Concentration of water vapor @ 275 K & 100% RH = 4.26 E-3 kg/kg air
  (from online atmospheric moisture calculator:
  www.natmus.dk/cons/tp/atmcalc/atmoclc1.htm)
- Flowrate (ave) = 150 cfm (70.8 L/s)

## CALCULATIONS:

Condensate = Warm air conc. − Cool air conc.

$$8.86\text{E-}3 \text{ kg/kg} - 4.26\text{ E-}3 \text{ kg/kg} = 4.60\text{ E-}3 \text{ kg/kg}$$

Ideal Gas Law: $\text{Density} = \frac{PM}{RT}$

$$= \frac{(0.15 \text{ atm})(29 \frac{g}{mol})}{(0.0821 \frac{L \cdot atm}{K \cdot mol})(275 K)(1000 \frac{g}{kg})}$$

$$\text{Density} = 1.93\text{ E-}4 \text{ kg/L}$$

Where:
P = pressure (atm)
M = molar mass (air = 29 g/mol)
R = universal gas constant ($0.0821 \frac{L \cdot atm}{K \cdot mol}$)
T = temp (K)

Condensate Generation = Flowrate × Condensate Ratio × Density

$$= 4.60\text{E-}3 \text{ kg/kg} \times 1.93\text{E-}4 \text{ kg/L} \times 70.8 \text{ L/s} \times 86{,}400 \text{ s/day} \times \frac{1 \text{ gall}}{8.35 \text{ kg}}$$

$$= 0.65 \text{ gallons/day condensate}$$

$$= 19.5 \text{ gallons/month}$$

**ERM Remediation & Construction Management West, Inc.**

915 - 118th Avenue S.E.
Suite 130
Bellevue, WA 98005
(425) 462-8591
(425) 455-3573 (fax)

30 April 2010

Mr. Ken Lederman
Riddell Williams P.S.
1001 Fourth Avenue Plaza, Suite 4500
Seattle, Washington 98154-1065

Mr. Robert L. DiJulio
Wolfstone, Panchot & Bloch, P.S., Inc.
1111 Third Avenue, Suite 1800
Seattle, Washington 98101

Subject: 2010 Semiannual Groundwater Monitoring Report
Harris/Manhattan Village Shopping Center
Normandy Park, Washington

Dear Messrs. Lederman and Mr. DiJulio:

This report summarizes the semiannual groundwater monitoring activities completed by ERM Remediation & Construction Management West, Inc. (ERM) in March 2010 at the Mountain Harris/Manhattan Village Shopping Center site in Normandy Park, Washington (the "Site"). These activities were completed in accordance with the *Final Soil Vapor Extraction Interim Remedial Action Design and Work Plan* dated March 2009 ("Work Plan"). The location of the Site is shown in Figure 1.

Although soil cleanup is the primary objective of the soil vapor extraction (SVE) interim action (IA), previous remedial efforts at the Site have indicated that the IA may reduce PCE concentrations in groundwater. Therefore, sampling and analysis of groundwater was completed to evaluate groundwater quality during SVE system operation. Seven monitoring wells were selected for inclusion in the semiannual groundwater sampling event due to their location within the radius of influence of the SVE wells. The locations of the seven monitoring wells are shown on Figure 2.

## *SCOPE OF WORK*

In March 2010, groundwater monitoring was performed to evaluate Site conditions relative to the operation of the SVE system. The groundwater monitoring activities included:

- Measurement of static groundwater levels in seven monitoring wells (DC-3, DC-4, DC-11, DC-13, KMW-2, KMW-9 and MW-4);
- Collection of groundwater samples from seven monitoring wells; and
- Laboratory analysis of the samples for chlorinated volatile organic compounds by USEPA (United States Environmental Protection Agency) Method 8260B.

## *GROUNDWATER MONITORING PROCEDURES AND RESULTS*

### *Static Groundwater Levels*

On 8 March 2010, groundwater levels were measured in the seven monitoring wells using an electric water level indicator. A summary of groundwater level measurements is included in Table 1.

### *Groundwater Sampling*

Monitoring well purging and sampling at each well was completed on 8 and 9 March 2010 using a bladder pump and low-flow techniques as described in the *Soil Vapor Extraction Interim Action Compliance Monitoring Plan* dated July 2009. The bladder pump was decontaminated and fitted with new polyethylene tubing prior to installation into each well. The groundwater samples were collected directly from the pump discharge tubing.

Each sample container was labeled with the sample location, sample identification number, date, and time. The samples were transported on ice to ALS Laboratory Group's facility in Everett, Washington, for analysis. Chain-of-custody procedures were followed during sample preparation, shipment, and handling. Chain-of-custody and laboratory quality assurance/quality control documentation is included with the laboratory data sheets in Attachment A.

## *ANALYTICAL RESULTS*

Analytical results for PCE in the groundwater samples are summarized in Table 2 and are illustrated on Figure 3. The common PCE degradation products trichloroethene, dichloroethene isomers, and vinyl chloride were not detected in the groundwater samples collected in March 2010. Tetrachloroethene (PCE) was detected above the MTCA Method A Cleanup Level of 5 parts per billion in four monitoring wells: MW-4, KMW-2, DC-4, and DC-13. PCE was detected in two monitoring wells (KMW-9 and DC-11) at concentrations less than the MTCA Method A Cleanup Level. PCE was not detected in the groundwater sample collected from monitoring well DC-3.

## *ANALYSIS AND CONCLUSIONS*

PCE concentrations in groundwater have decreased since SVE system startup in October 2009. Every well sampled during the March 2010 event revealed a reduction in concentration from the previous sampling event at each well, either in April 2007 or April 2008. These reductions ranged from 15 to greater than 90 percent, with an average of approximately 60 percent reduction in PCE concentration. Three of the seven wells sampled dropped below the MTCA Method A Cleanup Level during the April 2010 event, however, it should be noted that PCE concentrations at Well DC-3 have been observed below the MTCA Method A Cleanup Level during prior sampling events.

Based on available groundwater quality data from 1999 to the present, trends in groundwater quality data over the last several years indicate that significant variability in PCE concentrations over time is common in groundwater at each well (Figure 4). It is possible, therefore, that the decreases in PCE concentrations observed between April 2009 and March 2010 may be related to factors other than the operation of the SVE system. However, given that significant reductions in PCE concentrations were observed in groundwater in the vicinity of the SVE system operated by SCS in 1999-2000, it is ERM's opinion that the operation of the SVE system is likely contributing to the decrease of PCE concentrations in groundwater between April 2009 and March 2010.

We appreciate the opportunity to provide you with ongoing environmental consulting and remediation services. Please call Mike Arnold at 425.214.0454 or Erik Ipsen at 503.488.5014 if you have questions regarding this groundwater monitoring report.

Sincerely,

A. Michael Arnold, R.G., R.H.G.
*Senior Project Manager*

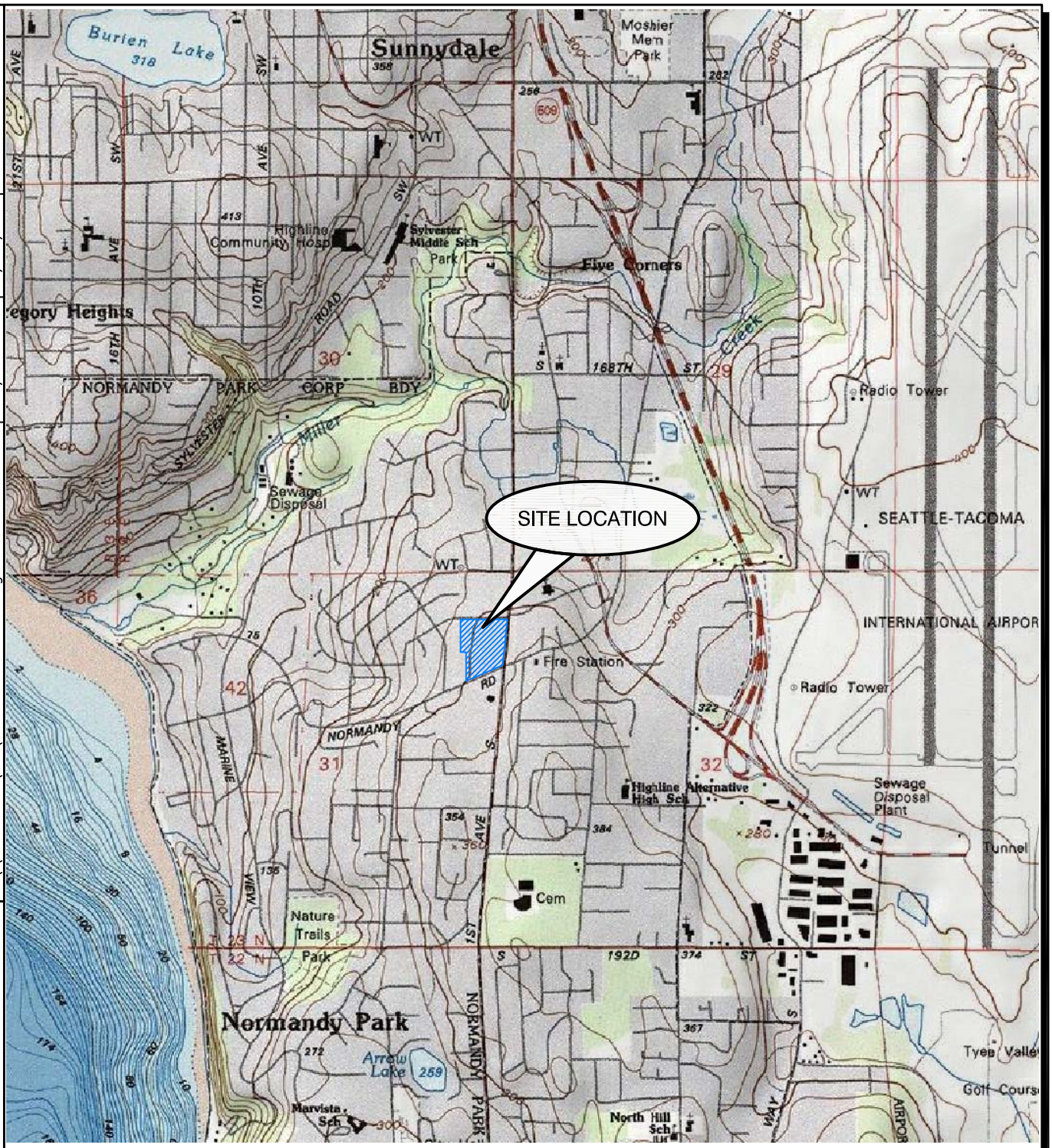
Erik C. Ipsen, P.E.
*Partner*

AMA/ECI/jjr/0099467.03

Attachments

*Figures*

Project No. 0075720.00
Date: 11/17/08
Drawn By: R.O./C.T.
CAD File: F:\0075720\00\007572000-17.dwg




SCALE 1: 24,000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

N

References:
TOPO!® Software
U.S.G.S. 7.5 Minute Series (Topographic) Quadrangle, Des Moines, WA
Version: 1995; Current: 1990

Figure 1
*Site Location Map*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM *11/08*

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
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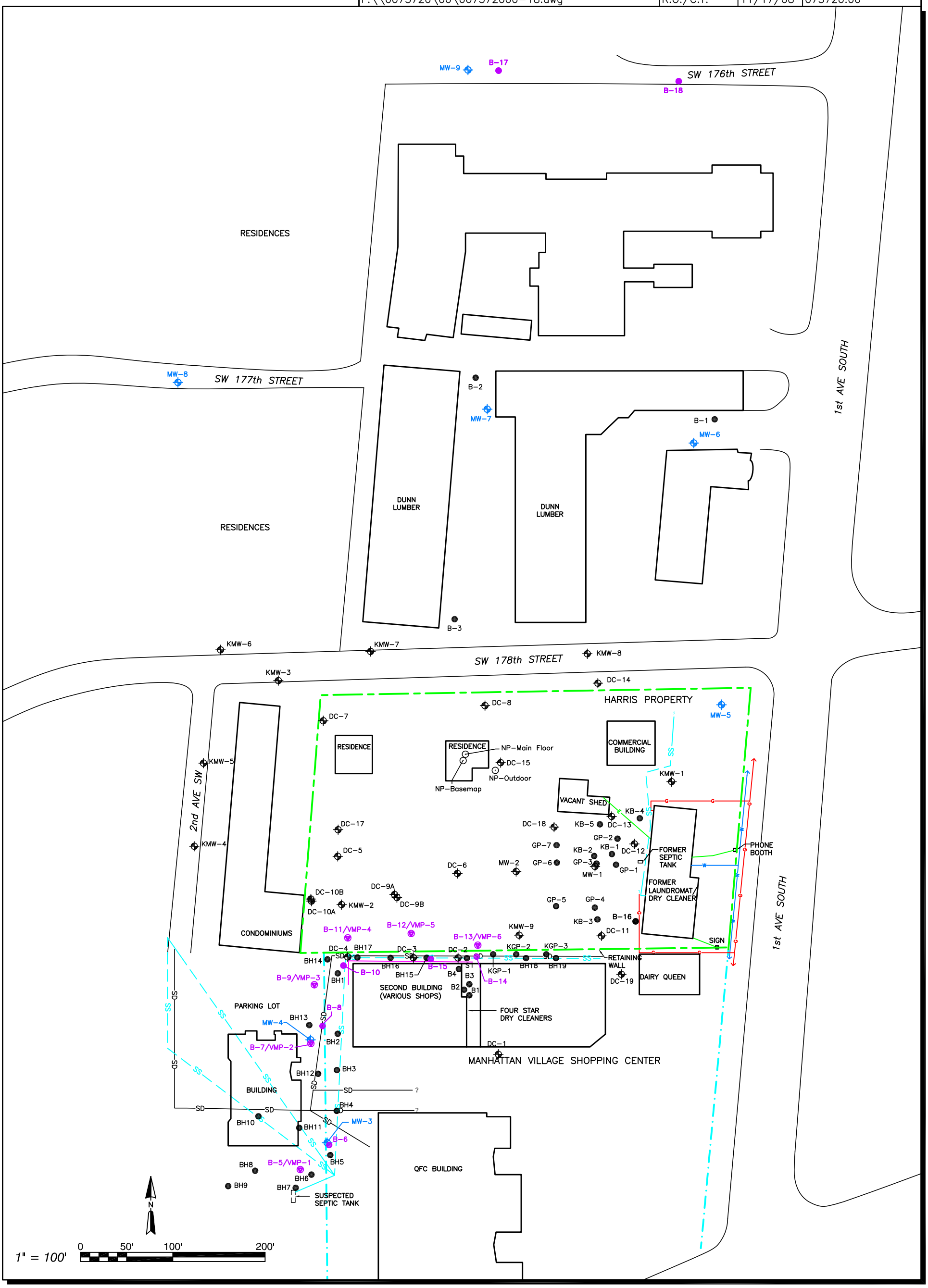


LEGEND

- Monitoring Well
- Soil Boring
- Soil Vapor Extraction Well
- Domestic Well
- Storm Water Catch Basin
- Monitoring Well, Installed 2008
- Soil Boring, Completed 2008
- Soil Vapor Probe, Installed 2008
- Air Sample, Collected 2008

- Approximate Harris Property Boundary
- Approximate Manhatten Plaza Shopping Center Property Boundary
- Underground Electrical Utility
- Underground Natural Gas Utility
- Underground Sewer Utility
- Underground Storm Drain Utility
- Underground Water Utility

# Figure 2
*Site Plan*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM 11/08

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| g:\\0099467\03\009946703-01.dwg | R. Olson | 04/26/10 | 0099467.03 |

N

0 50' 100' 200'

1" = 100'

RESIDENCES

MW-9

SW 176th STREET

1st AVE SOUTH

MW-8

SW 177th STREET

MW-7

MW-6

DUNN LUMBER

DUNN LUMBER

RESIDENCES

KMW-6

KMW-7

SW 178th STREET

KMW-8

KMW-3

DC-14

HARRIS PROPERTY

DC-8

MW-5

DC-7

KMW-5D

KMW-5

RESIDENCE

RESIDENCE

DC-15

COMMERCIAL BUILDING

KMW-1

2nd AVE SW

VACANT SHED

DC-17

DC-13 10

DC-18

DC-12

KMW-4

DC-16

DC-5

FORMER SEPTIC TANK

PHONE BOOTH

DC-6

MW-2

MW-1

FORMER LAUNDROMAT/ DRY CLEANER

DC-10B

DC-9A

KMW-2 81

DC-9B

DC-10A

CONDOMINIUMS

KMW-9 4.4

DC-11 4.6

SIGN

DC-4 9.2

DC-3 <2.0

DC-2

RETAINING WALL

DC-19

FORMER DAIRY QUEEN

SECOND BUILDING (VARIOUS SHOPS)

FOUR STAR DRY CLEANERS

PARKING LOT

MW-4 7.8

DC-1

MANHATTAN VILLAGE SHOPPING CENTER

BUILDING

MW-3

SUSPECTED SEPTIC TANK

QFC BUILDING

LEGEND

- Monitoring Well
- Shallow Monitoring Well
- Deep Monitoring Well
- 50.8 PCE Concentration (µg/L)
- Grayed symbols were not sampled.
- Storm Water Catch Basin
- Approximate Harris Property Boundary
- Approximate Manhattan Village Shopping Center Property Boundary
- Underground Electrical Utility
- Underground Natural Gas Utility
- Underground Sewer Utility
- Underground Storm Drain Utility
- Underground Water Utility

Figure 3

*PCE in Groundwater - March 2010*

*MVSC/Harris Properties*

*Normandy Park, Washington*

ERM 04/10

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| G:\\0099467\03\009946703-02.dwg | R. Olson | 04/26/10 | 0099467.03 |

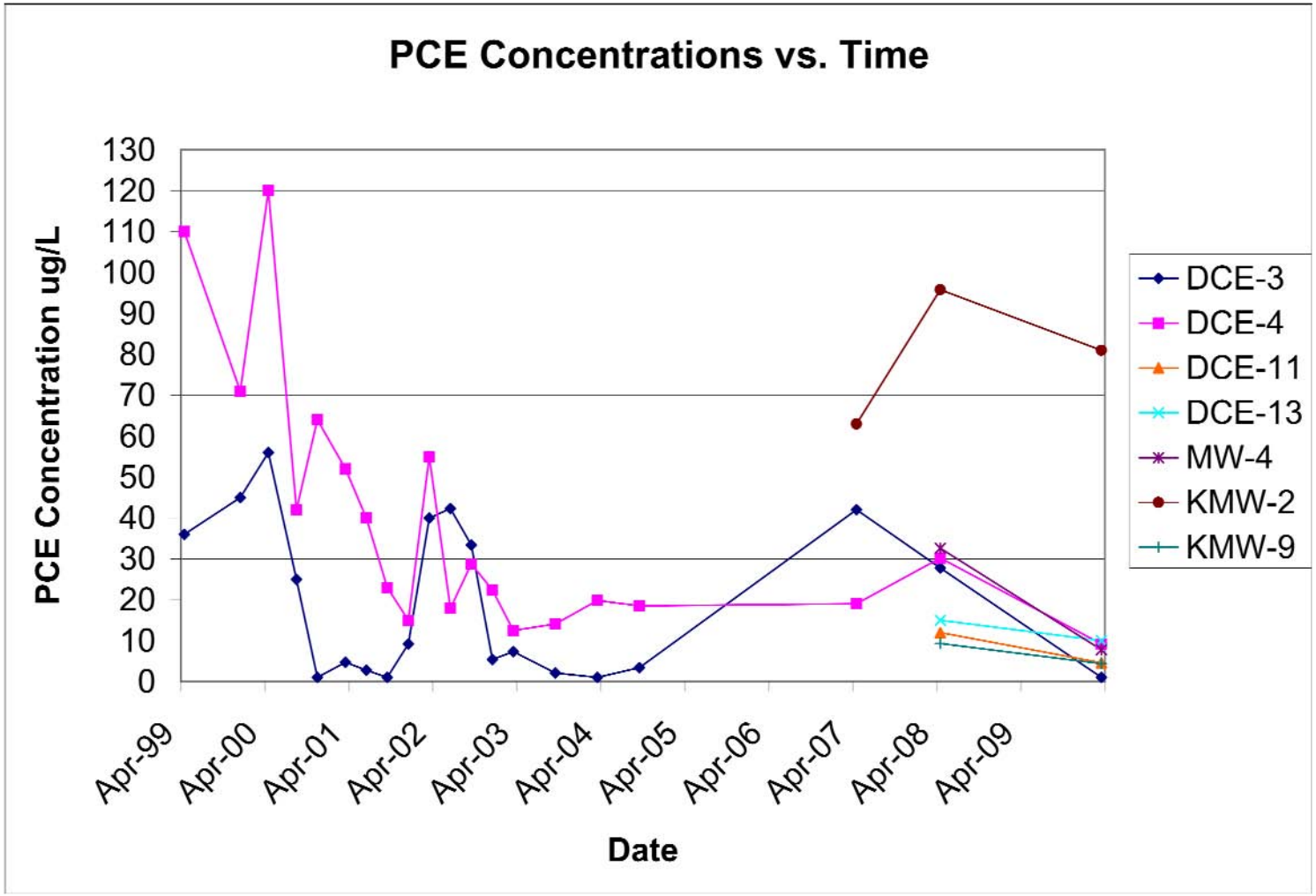


Figure 4

*PCE Concentrations in Groundwater 1999-2010*

*MVSC/Harris Properties*

*Normandy Park, Washington*

ERM 04/10

*Tables*

**Table 1**

*Water Levels - 10 March 2010*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Location | Well Casing Elevation (feet amsl) | Depth to Water (feet below well casing) | Water Level Elevation (feet amsl) |
|---|---|---|---|
| MW-4 | 310.54 | 38.66 | 271.88 |
| DC-3 | 313.23 | 41.53 | 271.70 |
| DC-4 | 312.12 | 40.74 | 271.38 |
| DC-11 | 311.02 | 39.54 | 271.48 |
| DC-13 | 310.85 | 38.82 | 272.03 |
| KMW-2 | 306.90 | 35.56 | 271.34 |
| KMW-9 | 310.18 | 38.77 | 271.41 |

**Table 2**

*Tetrachloroethene Concentrations in Groundwater*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (micrograms per liter) |
|---|---|---|
| MW-4 | 3/9/2010 | **7.8** |
| | 4/14/2008 | **32.6** |
| KMW-2 | 3/8/2010 | **81** |
| | 4/16/2008 | **95.8** |
| | 4/24/2007 | **63** |
| KMW-9 | 3/8/2010 | **4.4** |
| | 4/26/2007 | **9.3** |
| DC-3 | 3/9/2010 | <2 |
| | 4/14/2008 | **27.8** |
| | 4/26/2007 | **42** |
| | 9/7/2004 | **3.4** |
| | 3/16/2004 | <2 |
| | 9/3/2003 | **2.1** |
| | 3/31/2003 | **7.3** |
| | 12/10/2002 | **5.4** |
| | 9/17/2002 | **33.4** |
| | 6/13/2002 | **42.3** |
| | 3/13/2002 | **40** |
| | 12/20/2001 | **9.2** |
| | 9/17/2001 | <2 |
| | 6/20/2001 | **2.8** |
| | 3/6/2001 | **4.7** |
| | 11/14/2000 | <2 |
| | 8/3/2000 | **25** |
| | 4/26/2000 | **56** |
| | 12/8/1999 | **45** |
| | 4/7/1999 | **36** |

**Table 2**

*Tetrachloroethene Concentrations in Groundwater*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (micrograms per liter) |
|---|---|---|
| DC-4 | 3/9/2010 | **9.2** |
| | 4/14/2008 | **30.2** |
| | 4/26/2007 | **19** |
| | 9/7/2004 | **18.5** |
| | 3/16/2004 | **19.8** |
| | 9/3/2003 | **14.1** |
| | 3/31/2003 | **12.5** |
| | 12/10/2002 | **22.4** |
| | 9/17/2002 | **28.8** |
| | 6/13/2002 | **17.9** |
| | 3/13/2002 | **55** |
| | 12/20/2001 | **15** |
| | 9/17/2001 | **23** |
| | 6/20/2001 | **40** |
| | 3/6/2001 | **52** |
| | 11/14/2000 | **64** |
| | 8/3/2000 | **42** |
| | 4/26/2000 | **120** |
| | 12/8/1999 | **71** |
| | 4/7/1999 | **110** |
| DC-11 | 3/9/2010 | **4.6** |
| | 4/26/2007 | **12** |
| DC-13 | 3/1/2010 | **10** |
| | 4/16/2008 | **23** |
| | 4/25/2007 | **15** |
| Model Toxics Control Act Method A Groundwater Cleanup Level | | 5 |

**Notes:**

**Bold** entries indicate positive analyte detections.

Shaded cells indicate concentrations greater than the cleanup goal

*Attachment A*
*Laboratory Data Report*

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/8/2010 KMW-9-030810
ALS SAMPLE #: -01

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | 4.4 | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |



8620 Holly Drive Suite 100 Everett, WA 98208 425 356-2600 FAX 425 356-2626 Seattle 206 292-9059

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DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
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CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/8/2010 KMW-9-030810
ALS SAMPLE #: -01

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMT.
** UNITS FOR ALL NON-LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS.

APPROVED BY:

8620 Holly Drive Suite 100 Everett, WA 98208 425 356-2600 FAX 425 356-2626 Seattle 206 292-9059

## CERTIFICATE OF ANALYSIS

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Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/8/2010 KMW-2-030810
ALS SAMPLE #: -02

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | 81 | 10 | 5 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |



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WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/8/2010 KMW-2-030810
ALS SAMPLE #: -02

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMT.
** UNITS FOR ALL NON-LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS.

APPROVED BY:

8620 Holly Drive Suite 100 Everett, WA 98208 425 356-2600 FAX 425 356-2626 Seattle 206 292-9059

## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/8/2010 DC-13-030810
ALS SAMPLE #: -03

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | 10 | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |



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## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/8/2010 DC-13-030810
ALS SAMPLE #: -03

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMT.
** UNITS FOR ALL NON-LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS.

APPROVED BY:

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## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 DC-11-030910
ALS SAMPLE #: -04

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | 4.6 | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

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DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 DC-11-030910
ALS SAMPLE #: -04

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

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APPROVED BY:

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## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 DC-3-030910
ALS SAMPLE #: -05

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |



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DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 DC-3-030910
ALS SAMPLE #: -05

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

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## CERTIFICATE OF ANALYSIS

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DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 DC-4-030910
ALS SAMPLE #: -06

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | 9.2 | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |



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Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 DC-4-030910
ALS SAMPLE #: -06

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMT.
** UNITS FOR ALL NON-LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS.

APPROVED BY:

8620 Holly Drive Suite 100 Everett, WA 98208 425 356-2600 FAX 425 356-2626 Seattle 206 292-9059

## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 MW-4-030910
ALS SAMPLE #: -07

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | 7.8 | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |



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## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 MW-4-030910
ALS SAMPLE #: -07

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMT.
** UNITS FOR ALL NON-LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS.

APPROVED BY:

8620 Holly Drive Suite 100 Everett, WA 98208 425 356-2600 FAX 425 356-2626 Seattle 206 292-9059

## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling

## QUALITY CONTROL RESULTS

**SURROGATE RECOVERY**

| ALS SAMPLE ID | METHOD | SUR ID | % RECV |
|---|---|---|---|
| 1003050-01 | EPA-8260 | 1,2-Dichloroethane-d4 | 108% |
| 1003050-01 | EPA-8260 | 4-Bromofluorobenzene | 104% |
| 1003050-02 | EPA-8260 | 1,2-Dichloroethane-d4 | 111% |
| 1003050-02 | EPA-8260 | 4-Bromofluorobenzene | 103% |
| 1003050-02 5X Dilution | EPA-8260 | 1,2-Dichloroethane-d4 | 109% |
| 1003050-02 5X Dilution | EPA-8260 | 4-Bromofluorobenzene | 101% |
| 1003050-03 | EPA-8260 | 1,2-Dichloroethane-d4 | 110% |
| 1003050-03 | EPA-8260 | 4-Bromofluorobenzene | 103% |
| 1003050-04 | EPA-8260 | 1,2-Dichloroethane-d4 | 112% |
| 1003050-04 | EPA-8260 | 4-Bromofluorobenzene | 101% |
| 1003050-05 | EPA-8260 | 1,2-Dichloroethane-d4 | 111% |
| 1003050-05 | EPA-8260 | 4-Bromofluorobenzene | 103% |
| 1003050-06 | EPA-8260 | 1,2-Dichloroethane-d4 | 110% |
| 1003050-06 | EPA-8260 | 4-Bromofluorobenzene | 102% |
| 1003050-07 | EPA-8260 | 1,2-Dichloroethane-d4 | 110% |
| 1003050-07 | EPA-8260 | 4-Bromofluorobenzene | 102% |

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CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling

## QUALITY CONTROL RESULTS

**BLANK RESULTS**

| QC SAMPLE ID | MATRIX | METHOD | ANALYTE | RESULT | UNITS |
|---|---|---|---|---|---|
| MB-031110W | Water | EPA-8260 | Dichlorodifluoromethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Chloromethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Vinyl Chloride | ND(<0.20) | UG/L |
| MB-031110W | Water | EPA-8260 | Bromomethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Chloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Trichlorofluoromethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Carbon Tetrachloride | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1-Dichloroethene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Methylene Chloride | ND(<5.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Trans-1,2-Dichloroethene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1-Dichloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Cis-1,2-Dichloroethene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 2,2-Dichloropropane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Bromochloromethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Chloroform | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1,1-Trichloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1-Dichloropropene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2-Dichloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Trichloroethene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2-Dichloropropane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Dibromomethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Bromodichloromethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Trans-1,3-Dichloropropene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Toluene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Cis-1,3-Dichloropropene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1,2-Trichloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,3-Dichloropropane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Tetrachloroethylene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Dibromochloromethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2-Dibromoethane | ND(<0.010) | UG/L |
| MB-031110W | Water | EPA-8260 | Chlorobenzene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1,1,2-Tetrachloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Bromoform | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1,2,2-Tetrachloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2,3-Trichloropropane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Bromobenzene | ND(<2.0) | UG/L |



8620 Holly Drive Suite 100 Everett, WA 98208 425 356-2600 FAX 425 356-2626 Seattle 206 292-9059

## CERTIFICATE OF ANALYSIS

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DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling

## QUALITY CONTROL RESULTS

**BLANK RESULTS**

| QC SAMPLE ID | MATRIX | METHOD | ANALYTE | RESULT | UNITS |
|---|---|---|---|---|---|
| MB-031110W | Water | EPA-8260 | 2-Chlorotoluene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 4-Chlorotoluene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,3 Dichlorobenzene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,4-Dichlorobenzene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2-Dichlorobenzene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2-Dibromo 3-Chloropropane | ND(<10) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2,4-Trichlorobenzene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Hexachlorobutadiene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2,3-Trichlorobenzene | ND(<2.0) | UG/L |

APPROVED BY:

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## CERTIFICATE OF ANALYSIS

CLIENT: ERM
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Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling

## QUALITY CONTROL RESULTS

**BLANK SPIKE/BLANK SPIKE DUPLICATE RESULTS**

| QC BATCH ID | MATRIX | METHOD | ANALYTE | SPIKE AMOUNT | BLANK SPIKE RECOVERY | BLANK SPIKE DUPLICATE RECOVERY | RPD |
|---|---|---|---|---|---|---|---|
| 598 | Water | EPA-8260 | 1,1-Dichloroethene | 10 | 89% | 84% | 5 |
| 598 | Water | EPA-8260 | Trichloroethene | 10 | 81% | 78% | 4 |
| 598 | Water | EPA-8260 | Toluene | 10 | 83% | 79% | 4 |
| 598 | Water | EPA-8260 | Chlorobenzene | 10 | 85% | 82% | 4 |

APPROVED BY:

8620 Holly Drive Suite 100 Everett, WA 98208 425 356-2600 FAX 425 356-2626 Seattle 206 292-9059

**ALS Laboratory Group**
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
(206) 292-9059 Seattle
(425) 356-2626 Fax
http://www.alsenviro.com

# Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): 1003050

Date _____ Page 1 Of 1

PROJECT ID: Normandy Park GW Sampling
REPORT TO COMPANY: ERM-West
PROJECT MANAGER: Mike Arnold
ADDRESS: 915 - 118th Ave, SE Ste 130
Bellevue WA 98005
PHONE: 425 214 0454 FAX:
P.O. NUMBER: 99467.04 E-MAIL: mike.arnold.com
INVOICE TO COMPANY: ERM-West
ATTENTION: Acct Payable
ADDRESS: 1277 Treat BLVD, Ste 500
Walnut Creek 94597

LABORATORY COPY

| SAMPLE I.D. | DATE | TIME | TYPE | LAB# | NWTPH-HCID | NWTPH-DX | NWTPH-GX | BTEX by EPA-8021 | MTBE by EPA-8021 ☐ EPA-8260 ☐ | Halogenated Volatiles by EPA 8260 | Volatile Organic Compounds by EPA 8260 | EDB / EDC by EPA 8260 SIM (water) | EDB / EDC by EPA 8260 (soil) | Semivolatile Organic Compounds by EPA 8270 | Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐ | PCB ☐ Pesticides ☐ by EPA 8081/8082 | Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐ | Metals Other (Specify) | TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐ | OTHER (Specify): Chlorinated VOCs 8260 | | | | | | | NUMBER OF CONTAINERS | RECEIVED IN GOOD CONDITION? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. kMW-9-030810 | 3/8/10 | 1316 | W | 1 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 2. kMW-2-030810 | 3/8/10 | 1425 | W | 2 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 3. DC-13-030810 | 3/8/10 | 1526 | W | 3 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 4. DC-11-030910 | 3/9/10 | 0951 | W | 4 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 5. DC-3-030910 | 3/9/10 | 1120 | W | 5 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 6. DC-4-030910 | 3/9/10 | 1245 | W | 6 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 7. MW-4-030910 | 3/9/10 | 1347 | W | 7 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 8. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: _____ ERM 3/9/10 1500
Received By: _____ ALS 3/10/10 1:40
2. Relinquished By: _____
Received By: _____

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: [X] Standard | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: 5 Standard | 3 | 1 | SAME DAY

OTHER:
Specify: _____

* Turnaround request less than standard may incur Rush Charges

**Environmental Resources Management**

915 – 118th Avenue SE
Suite 130
Bellevue, WA 98005
(425) 462-8591
(425) 455-3573 (fax)
www.erm.com

5 January 2011

Mr. Dale Myers
Department of Ecology
Northwest Region Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

Subject: FINAL Site Remediation Progress Summary
Harris/Manhattan Village Shopping Center
Normandy Park, Washington
VCP# NW1873

Dear Mr. Myers:

ERM-West, Inc. (ERM) has prepared this Site Remediation Progress Summary for the Harris/Manhattan Village Shopping Center site in Normandy Park, Washington (the "site") to summarize the activities conducted from February 2009 through December 2010, and to discuss future planned remedial actions at the site.

The site consists of two properties, each containing multiple parcels, the Manhattan Village Shopping Center and the Harris property. The properties are adjacent, and tetrachloroethene (PCE) has been released from both properties.

In February 2009, ERM completed the Final Data Gap Investigation Report. This document summarized the results of numerous previous investigations and characterized the nature and extent of contamination at the site. Based on the results of the Data Gap Investigation and previous remedial efforts, it was determined that the best course of remedial action was to install a soil vapor extraction (SVE) system. An SVE system has been installed and operated at the site as an interim remedial action pending completion of the final remedial action plan.

Installation of the SVE system began in August 2009, and was completed in September 2009. Since completion, the SVE system has been operated continuously. Monthly operations and maintenance (O&M) progress reports have been generated summarizing the performance of the SVE system. Typical activities associated with the O&M include:

- Recording well head and vacuum system gauge measurements including air flow rate, temperature, vacuum pressure, and organic vapor concentration;

- Measuring well head vacuum at the vapor monitoring points and two groundwater monitoring wells partially screened in the vadose zone;
- Sampling and laboratory analysis of the SVE effluent vapor stream; and
- Switching of discrete groups of wells from vacuum to vent wells.

The most recent SVE system O&M report was issued in November 2010 and is included as Attachment 1. This report includes a summary of system operational conditions from startup in September 2009 through early November 2010. A final report of SVE system operation is planned for distribution to Ecology once the SVE system operation is complete and soil samples collected from borings in the SVE operation area confirm that vadose-zone concentrations of PCE have been reduced to acceptable levels.

In March 2010, groundwater monitoring to evaluate the effect of SVE system operation on PCE concentrations in groundwater was completed at a select group of wells. The report for the March 2010 groundwater monitoring event is included as Attachment 2. Groundwater quality data from a groundwater sampling event completed in November 2010 are included in the table in Attachment 3. The report for the November 2010 sampling event is currently in development.

An in situ chemical oxidation pilot test is scheduled for the site in early 2011. The purpose of the pilot study is to evaluate the effectiveness of in situ chemical oxidation using potassium permanganate to remediate the residual PCE in groundwater. The pilot test results will be used to support a final remedial alternative selection in the site Feasibility Study. Based on the results of the pilot test, development of the final site Feasibility Study and implementation of full-scale groundwater remediation are currently scheduled for late 2011.

The project team has maintained communications with the downgradient property owners, and is providing them information on the progress of remedial action on an ongoing basis.

Please call Mike Arnold at (425) 214-0454 if you have questions regarding this progress report.

Sincerely,

A. Michael Arnold, R.G.
*Senior Project Manager*

Erik C. Ipsen, P.E.
*Partner*

AMA/ECI/ssh/0117205.03
Attachments

*Attachment 1*
*November 2010 Soil Vapor Extraction System Operation and Maintenance Report*

**Environmental Resources Management**

915 - 118th Avenue SE
Suite 130
Bellevue, WA 98005
(425) 462-8591
(425) 455-3573 (fax)

21 December 2010

*Via Electronic Mail*

Mr. Ken Lederman
Riddell Williams P.S.
1001 Fourth Avenue Plaza, Suite 4500
Seattle, Washington 98154-1065

Mr. Robert L. DiJulio
Wolfstone, Panchot & Bloch, P.S., Inc.
1111 Third Avenue, Suite 1800
Seattle, Washington 98101

Subject: Monthly Progress Report – November 2010
Soil Vapor Extraction System
Harris/Manhattan Village Shopping Center
Normandy Park, Washington

Dear Messrs. Lederman and DiJulio:

ERM-West, Inc. (ERM) has prepared this Monthly Progress Report for the soil vapor extraction (SVE) system installed at the Harris/Manhattan Village Shopping Center site in Normandy Park, Washington (the "site"). This report has been prepared in accordance with the *Final Soil Vapor Extraction Interim Remedial Action Design and Work Plan* dated March 2009.

This operation and maintenance (O&M) event covers the 13th full month of SVE system operation. O&M activities for the month were completed on 1 November 2010. System O&M included the following tasks:

- Recording well head and vacuum system gauge measurements including air flow rate, temperature, vacuum pressure, and organic vapor concentration;
- Measuring well head vacuum at the vapor monitoring points and two groundwater monitoring wells partially screened in the vadose zone;
- Sampling and laboratory analysis of the SVE effluent vapor stream; and
- Switching vacuum from the Group B SVE wells to a new Group C SVE well configuration (see description below) at the completion of performance monitoring.

### *Group C and Group D Well Configuration*

For the 1 November 2010 O&M event, a new well configuration (Group C) was brought online. As shown on Table 2, the new Group C configuration includes SVE wells SVE-1, SVE-2, SVE-5, SVE-6, SVE-7, and SVE-10. At the completion of the December O&M event, a second new configuration (Group D) will be brought online and operated under vacuum while the remaining wells function as air intake wells. The new Group D configuration will include SVE wells SVE-1, SVE-2, SVE-3, SVE-4, and SVE-6.

The previous Group A and B well configurations generally move air along an east to west axis. The Group C well configuration was designed to move air along the southwest to northeast axis. The purpose of the new well configurations is to evaluate the effectiveness of different air flow patterns, in an effort to maximize the efficiency of the SVE system.

At the completion of the December O&M event, the PID (photoionization detector) results and the effluent stack sample will be evaluated to determine the effectiveness of the new Group C configuration on contaminant mass removal.

### *November 2010 Effluent Vapor Sampling*

During the November 2010 O&M activities, a vapor effluent sample was collected for tetrachloroethene (PCE) analysis while the Group B wells were still on line. Once the operating well group was switched to Group C wells, a second vapor effluent sample was collected. The effluent sample from the Group C wells was collected after allowing the system to operate for approximately 1 hour after switching extraction from the Group B wells. By collecting a sample at both the beginning and end of the month, a more representative average PCE concentration can be derived for the sampling period.

The effluent vapor samples were collected from both Group B and Group C well set effluents using Summa canisters. The vapor samples were collected to evaluate PCE removal effectiveness and to verify optimal system performance and confirm system operation below the Puget Sound Clean Air Agency threshold value of 500 pounds (lbs) per year for PCE (soil and groundwater remediation projects that discharge below this threshold do not require an air operating permit). ALS Laboratory Group located in Salt Lake City, Utah, analyzed the samples using USEPA (United States Environmental Protection Agency) Method TO-15. Analytical results are summarized in Table 1 which is included as Attachment A.

For the October O&M period ending on 1 November 2010, the Group B wells were operated under vacuum, and the Group A wells acted as air intake wells, with the exception of SVE-6 and SVE-10, which as noted previously, are constantly operated under vacuum in these well groupings. Table 2 includes a list of the Group A and Group B configurations in addition to the two new configurations (Group C and Group D) wells. At the completion of the December O&M event, the Group D wells will be operated under vacuum and the remaining wells will operate as air intake wells.

***Table 2 Soil Vapor Extraction System Well Groupings***

| | |
|---|---|
| **Group A Wells** | SVE-1, SVE-3, SVE-5, SVE-6*, SVE-7, SVE-9, and SVE-10* |
| **Group B Wells** | SVE-2, SVE-4, SVE-6*, SVE-8, and SVE-10* |
| **Group C Wells** | SVE-1, SVE-2, SVE-5, SVE-6*, SVE-7, and SVE-10* |
| **Group D Wells** | SVE-1, SVE-2, SVE-3, SVE-4 and SVE-6* |

* SVE-6 is under vacuum in each operating scenario and SVE-10 is under vacuum in Group A, B, and C operating scenarios.

Complete laboratory analytical results for the vapor samples are included in Attachment B. Sampling data and analytical results from the O&M activities were recorded and entered into data spreadsheets included as Attachment C. The results of these tasks are presented below.

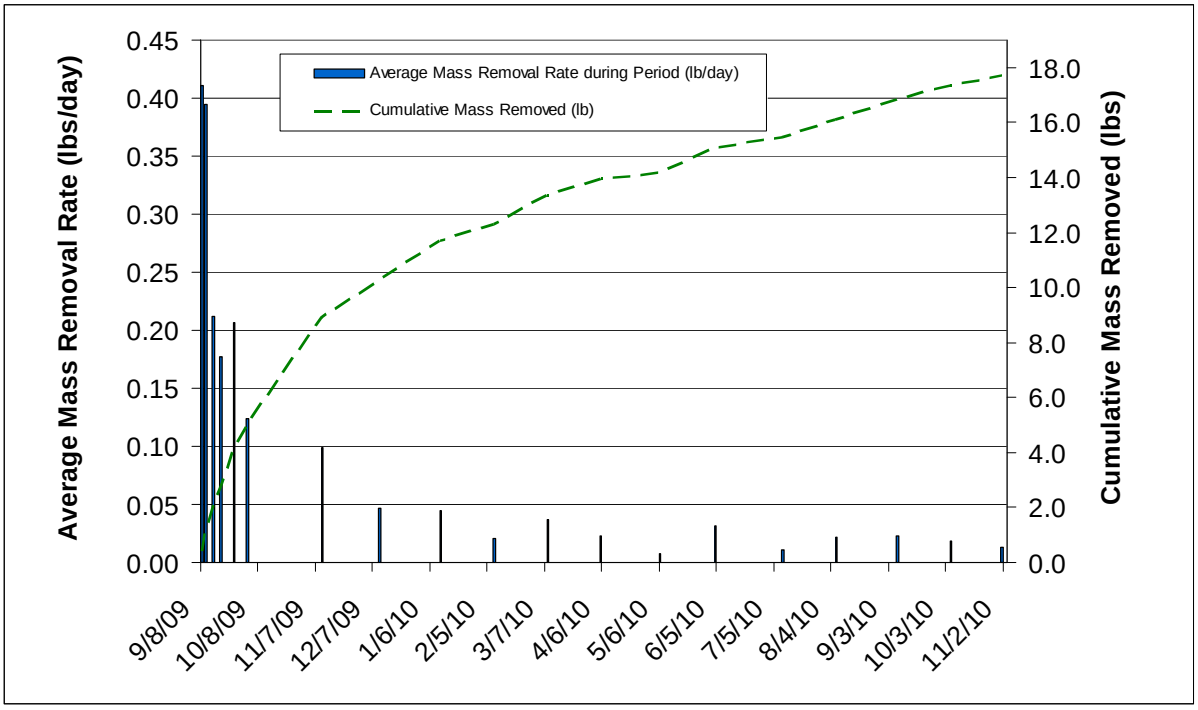
The effluent vapor sample collected from the Group B well effluent on 1 November 2010 resulted in a slightly higher PCE concentration (2,100 micrograms per cubic meter [$\mu g/m^3$]) compared to the sample collected from the Group B well effluent at the beginning of the month (1,900 $\mu g/m^3$). The average of the two effluent vapor samples (2,000 $\mu g/m^3$) was used in the calculation to obtain the mass removal rate for November 2010 (0.01 lbs/day).

The effluent sample collected from the Group C well effluent on 1 November 2010 contained a concentration of PCE of 1,800 $\mu g/m^3$. This value will be used to calculate the PCE mass removal between 1 November 2010 and the December 2010 monitoring event, once the December Group C sample results are available.

### *Mass Removal Estimates*

Based on laboratory analytical results from the initial monitoring events and system flow readings, it is estimated that approximately 17.7 lbs of PCE have been recovered by the system as of 1 November 2010. Figure 1 presents a summary of average mass removal rates and cumulative mass removed by the system. Calculations of the estimated mass removal rate of PCE are presented in Attachment D.

***Figure 1 Estimated PCE Average Mass Removal Rates and Cumulative Mass Removed During Monitoring Period***




### *Vacuum Measurements*

Vacuum measurements were collected from each of six vapor monitoring points and two wells screened in the vadose zone during the monitoring events using Magnehelic vacuum gauges. The observed vacuums show strong influence in both the paved and unpaved portions of the site. Vacuum readings from vapor monitoring probes and monitoring wells indicate an average SVE radius of influence of approximately 100 feet is generally being achieved across the site. A vacuum

reading of approximately 0.46 inches of water was observed in monitoring well DC-1, located south of the Manhattan Village Shopping Center building, and partially screened in the vadose zone, indicating that a radius of influence of up to 120 feet is being achieved beneath the building.

***Condensate Collection***

The SVE system generated approximately 75 gallons of condensate water during the October O&M period, which ended on 1 November 2010, likely due to colder ambient temperatures and increased rainfall during the monitoring period. In addition to approximately 60 gallons of condensate water from the previous winter, the collection tank was pumped out into three 55-gallon drums for disposal. Clean Harbors, Inc. has been contacted to collect the drums for disposal and it is anticipated that this will occur during the next O&M event in December of 2010.

***Summary***

In summary, based on observed mass removal rates and vacuum measurements to date, it appears the SVE system is operating as designed and effectively removing PCE mass from the subsurface.

We appreciate the opportunity to provide you with ongoing environmental consulting and remediation services. Please call the undersigned at (425) 214-0454 if you have questions regarding this progress report.

Sincerely,

A. Michael Arnold, R.G.
*Senior Project Manager*

Erik C. Ipsen, P.E.
*Partner*

AMA/ECI/jth/ssh/0117205.03
Attachments

*Figure*

Project No. 0117205.03
Date: 11/22/10
Drawn By: C.Tallada
CAD File: F:\0117205\03\0117205503-10.dwg

2nd AVE SW
1st AVE S
RESIDENCE
RESIDENCE
COMMERCIAL BUILDING
VACANT SHED
WELL HOUSE
UNDEVELOPED VEGETATED AREA (APPROXIMATE ELEVATION = 308.5')
CONDOMINIUMS
TREATMENT SYSTEM
GRAVEL
FORMER SEPTIC TANK
FORMER LAUNDROMAT/ DRY CLEANER
PHONE BOOTH
SIGN
RETAINING WALL
FORMER DAIRY QUEEN
ASPHALT PARKING LOT (APPROXIMATE ELEVATION = 313.5')
50' (TYP)
SECOND BUILDING (VARIOUS SHOPS)
FOUR STAR DRY CLEANERS
MANHATTAN VILLAGE SHOPPING CENTER
ASPHALT PARKING LOT
BUILDING
QFC BUILDING
SUSPECTED SEPTIC TANK

KMW-5D (NM)
KMW-5 (NM)
KMW-4 (NM)
KMW-1 (NM)
KMW-2 (NM)
KMW-9 (NM)
DC-15 (NM)
DC-17 (NM)
DC-16 (NM)
DC-5 (NM)
DC-18 (NM)
DC-13 (NM)
DC-12 (NM)
DC-6 (NM)
MW-2 (NM)
MW-1 (NM)
DC-9A (NM)
DC-10B (NM)
DC-10A (NM)
DC-9B (NM)
DC-2 (NM)
DC-11 (NM)
DC-4 (NM)
DC-3 (NM)
DC-19 (0.66)
DC-1 (0.46)
MW-4 (NM)
MW-3 (NM)

VMP-4 (0.50)
VMP-5 (0.62)
VMP-6 (0.52)
VMP-3 (0.49)
VMP-2 (0.37)
VMP-1 (0.0)

SVE-1 (0.34)
SVE-2 (6)
SVE-3 (0.48)
SVE-4 (10)
SVE-5 (0.56)
SVE-6 (12)
SVE-7 (1.0)
SVE-8 (11)
SVE-9 (0.56)
SVE-10 (5)

0.1
1.0

LEGEND

- EXISTING MONITORING WELL
- EXISTING SVE WELL–VENTING
- EXISTING SVE WELL–ACTIVE
- EXISTING VAPOR MONITORING WELL
- (7.0) IN–WELL VACUUM (INCHES $H_2O$)
- * WATER LEVEL ABOVE SCREENED INTERVAL AT 40.44 FEET
- (NM) NOT MEASURED
- VACUUM ISOCONTOUR (INCHES $H_2O$)
- EXISTING GROUND SVE PIPING
- EXISTING UNDERGROUND SVE PIPING
- MVSC PROPERTY LINE
- HARRIS PROPERTY LINE

MVSC – MANHATTAN VILLAGE SHOPPING CENTER
SVE – SOIL VAPOR EXTRACTION

N

0 25' 50' 100'
1" = 50'

Figure 2
*Group B In-Well Vacuum Readings*
*November 2010*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM 11/10

*Attachment A*
*Laboratory Analytical Results*

## *Table 1 Soil Vapor Extraction Effluent Sample Results for 8 September 2009 – 1 November 2010*

| Sample ID | Well Grouping | Sample Location | Date of Sample | PCE Conc. (ppbv) | PCE Conc. (µg/m³) |
|---|---|---|---|---|---|
| STK-1-090809 | A | Effluent Stack | 9/8/09 | 11,000 | 74,000 |
| STK-1-091009 | A | Effluent Stack | 9/10/09 | 10,000 | 69,000 |
| STK-1-091409 | A | Effluent Stack | 9/14/09 | 1,300 | 8,500 |
| STK-1-091809 | A | Effluent Stack | 9/18/09 | 8,000 | 54,000 |
| STK-1-092509 | A | Effluent Stack | 9/25/09 | 2,600 | 18,000 |
| STK-1-100209 | A | Effluent Stack | 10/2/09 | 3,700 | 25,000 |
| STK-1-111009 | B | Effluent Stack | 11/10/09 | 1,200 | 8,100 |
| STK-1-A-121009 | A | Effluent Stack | 12/10/09 | 800 | 5,500 |
| STK-1-B-121009 | B | Effluent Stack | 12/10/09 | 870 | 5,900 |
| STK-1-B-011110 | B | Effluent Stack | 1/11/10 | 830 | 5,700 |
| STK-1-A-011110 | A | Effluent Stack | 1/11/10 | 240 | 1,600 |
| STK-1-A-020810 | A | Effluent Stack | 2/8/10 | 610 | 4,100 |
| STK-1-B-020810 | B | Effluent Stack | 2/8/10 | 670 | 4,600 |
| STK-1-B-030810 | B | Effluent Stack | 3/8/10 | 860 | 5,800 |
| STK-1-A-030810 | A | Effluent Stack | 3/8/10 | 190 | 1,300 |
| STK-1-A-040510 | A | Effluent Stack | 4/5/10 | 730 | 5,000 |
| STK-1-B-040510 | B | Effluent Stack | 4/5/10 | 190 | 1,300 |
| STK-1-B-050610 | B | Effluent Stack | 5/6/10 | 140 | 960 |
| STK-1-A-050610 | A | Effluent Stack | 5/6/10 | 940 | 6,400 |
| STK-1-A-060410 | A | Effluent Stack | 6/4/10 | 480 | 3,300 |
| STK-1-B-060410 | B | Effluent Stack | 6/4/10 | 400 | 2,700 |
| STK-1-B-070910 | B | Effluent Stack | 7/9/10 | 110 | 750 |
| STK-1-A-070910 | A | Effluent Stack | 7/9/10 | 180 | 1,200 |
| STK-1-A-080610 | A | Effluent Stack | 8/6/10 | 900 | 6,100 |
| STK-1-B-080610 | B | Effluent Stack | 8/6/10 | 520 | 3,500 |
| STK-1-B-090710 | B | Effluent Stack | 9/7/10 | 590 | 4,000 |
| STK-1-A-090710 | A | Effluent Stack | 9/7/10 | 270 | 1,800 |
| STK-1-A-100510 | A | Effluent Stack | 10/5/10 | 610 | 4,100 |
| STK-1-B-100510 | B | Effluent Stack | 10/5/10 | 280 | 1,900 |
| STK-1-B-1101010 | B | Effluent Stack | 11/1/10 | 320 | 2,100 |
| STK-1-C-110110 | C | Effluent Stack | 11/1/10 | 260 | 1,800 |

**Notes:**
µg/m³ = micrograms per cubic meter
ppbv = parts per billion by volume

*Attachment B*
*Laboratory Analytical Data Package*

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# ANALYTICAL REPORT
# Amended

Report Date: November 11, 2010

Cyrus Gorman
ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

Phone: (425) 214-0468

E-mail: cyrus.gorman@erm.com

Workorder: **1030708**
Project ID: **ERM 110310**
Purchase Order: 117205.03

| Client Sample ID | Lab ID | Collect Date | Receive Date | Sampling Site |
|---|---|---|---|---|
| Stk-1:B: 110110 | 1030708001 | 11/01/10 | 11/03/10 | |
| Stk-1:C: 110110 | 1030708002 | 11/01/10 | 11/03/10 | |

# ANALYTICAL REPORT
# Amended

**Client:** ERM
**Project Manager:** Paul E. Pope

## Analytical Results

Workorder: **1030708**

Sample ID: **Stk-1:B: 110110** | Matrix: Air | Collected: 11/1/2010
Lab ID: 1030708001 | Media: Summa 6 Liter Canister | Received: 11/3/2010
Sampling Site: NA | Sampling Parameter: NA

### Analysis Method - EPA TO-15

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instr ID:** 5972-W
**Batch:** IVOA/1519 (HBN: 57699) | **Percent Solids:** NA
**Analyzed:** 11/9/2010 9:28:00 AM | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL | RL | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **320** | **2100** | 1.8 | 10 | **20** | |

Sample ID: **Stk-1:C: 110110** | Matrix: Air | Collected: 11/1/2010
Lab ID: 1030708002 | Media: Summa 6 Liter Canister | Received: 11/3/2010
Sampling Site: NA | Sampling Parameter: NA

### Analysis Method - EPA TO-15

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instr ID:** 5972-W
**Batch:** IVOA/1519 (HBN: 57699) | **Percent Solids:** NA
**Analyzed:** 11/9/2010 10:02:00 AM | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL | RL | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **260** | **1800** | 1.8 | 10 | **20** | |

## Report Authorization

### Analysis Method - EPA TO-15

Lisa M. Reid — **Analyst**
Thomas Bosch — **Peer Review**

## Laboratory Contact Information

Phone: (801) 266-7700
Email: alslt.lab@alsglobal.com
Web: www.datachem.com

ALS Laboratory Group (formerly DataChem Laboratories, Inc.)
960 W Levoy Drive
Salt Lake City, Utah 84123

## General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS is accredited by the State of Utah, Bureau of Laboratory Improvement under NELAP for specific fields of testing as documented in its current scope of accreditation (ID# DATA1) which is available by request or on the internet at http://health.utah.gov/lab/labimp/labcert/envlabcert.html. The quality systems implemented in the laboratory apply to all methods performed by ALS regardless of this current scope of accreditation which does not include performance based methods, modified methods and methods applied to matrices not listed in the methods.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

# ANALYTICAL REPORT
# Amended

**Client:** ERM
**Project Manager:** Paul E. Pope

## Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

## Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

1030708

# Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # 1030708

Page 1 of 1

| | | | |
|---|---|---|---|
| Report To | | **Report Format / Distribution** | **Service Requested** (Rush for routine analysis subject to availability) |
| Company: | ERM-West | ☐ Standard ☐ Other | ◉ Regular (Default) |
| Contact: | Cyrus Gorman | ☑ PDF ☐ Excel ☐ Digital ☐ Fax | ○ Priority (Specify Date Required → → ) Surcharges apply |
| Address: | 915 - 118th Avenue SE, Suite 130 | Email 1: cyrus.gorman@erm.com | ○ Emergency (1 Business Day) - 100% Surcharge |
| | Bellevue Washington, 98005 | Email 2: | ○ For Emergency < 1 Day, ASAP or Weekend - Contact ALS |
| Phone: | 425-214-0468 Fax: 425-455-3573 | | |
| **Invoice To** | Same as Report ? ☐ Yes ☑ No | **Client / Project Information** | **Analysis Request** |
| Company: | ERM-West | Job #: 117205.03 | Please indicate below Filtered, Preserved or both (F, P, F/P) |
| Contact: | Accounts Payable | PO / AFE: | |
| Address: | 1277 Treat Boulevard, Suite 500 | LSD: | |
| | Walnut Creek, California 94597 | | |
| Phone: | 925-482-3213 Fax: | Quote #: | |
| Lab Work Order # (lab use only) | | ALS Contact: | Sampler: |

| Sample # | Sample Identification (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | TO-15 (PCE) | Number of Containers |
|---|---|---|---|---|---|---|
| 1030708 | Stk-1:B:110110 | 01-Nov-10 | 15:00 | Air | X | 1 |
| 1030708 | Stk-1:C:110110 | 01-Nov-10 | 16:15 | Air | X | 1 |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
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| | | | | | | |

**Special Instructions / Regulations / Hazardous Details**

Please include Job # on the invoice units PPB & ug/M3, GL SUMMA's

**Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.**

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

**Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.**

| SHIPMENT RELEASE (client use) | | | SHIPMENT RECEPTION (lab use only) | | | | SHIPMENT VERIFICATION (lab use only) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Released by: | Date (dd-mmm-yy) | Time (hh-mm) | Received by: | Date: | Time: | Temperature: | Verified by: | Date: | Time: | Observations: Yes / No ? If Yes add SIF |
| Cyrus Gorman | 11/2/10 | 1315 | | 11-3-10 | 10:05 | °C | | | | |

GENF 18.02 Front

2010-11-03--01

*Attachment C*
*System Monitoring Data Spreadsheets*

***Wellhead Monitoring***
***Group A Wells - Vent***
***MVSC/Harris Properties SVE System***
***Normandy Park, WA***

**DATE:** 7/9/2010

| **Well** | **Vacuum** (inches $H_2O$) |
|---|---|
| SVE-1 | 0.28 |
| SVE-3 | 0.48 |
| SVE-5 | 0.6 |
| SVE-7 | 1 |
| SVE-9 | NM |

**DATE:** 9/7/2010

| **Well** | **Vacuum** (inches $H_2O$) |
|---|---|
| SVE-1 | 0.26 |
| SVE-3 | 0.42 |
| SVE-5 | 0.49 |
| SVE-7 | 1 |
| SVE-9 | 0.39 |

**DATE:** 11/1/2010

| **Well** | **Vacuum** (inches $H_2O$) |
|---|---|
| SVE-1 | 0.34 |
| SVE-3 | 0.48 |
| SVE-5 | 0.56 |
| SVE-7 | 1 |
| SVE-9 | 0.56 |

Notes:
NM = not measured

*Wellhead Monitoring*
*Group B Wells - Extraction*
*MVSC/Harris Properties SVE System*
*Normandy Park, Washington*

**DATE:** 11/10/2009

| Well | Velocity (ft/min) | Vacuum (inches $H_2O$) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|
| SVE-2 | 2934 | 7.0 | 58.7 | 1.6 | 0.9 |
| SVE-4 | 8340 | 12.0 | 51.8 | 1.2 | 0.7 |
| SVE-6 | 7920 | 16.0 | 47.1 | 3.8 | 2.2 |
| SVE-8 | 6120 | 11.0 | 46.8 | 0.08 | 0.0 |
| SVE-10 | 3120 | 5.4 | 54.6 | 0.2 | 0.1 |

**DATE:** 1/11/2010

| Well | Velocity (ft/min) | Vacuum (inches $H_2O$) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|
| SVE-2 | 2460 | 12.0 | 49.8 | 0.8 | 0.5 |
| SVE-4 | 2980 | 10.0 | 47.7 | 0.1 | 0.1 |
| SVE-6 | 7650 | 20.0 | 47.3 | 1 | 0.6 |
| SVE-8 | 6050 | 13.0 | 48.2 | 0.5 | 0.3 |
| SVE-10 | 6650 | 8.0 | 48.8 | 0.3 | 0.2 |

**DATE:** 3/8/2010

| Well | Velocity (ft/min) | Vacuum (inches $H_2O$) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|
| SVE-2 | 2390 | 10.0 | 47.8 | 0.9 | 0.5 |
| SVE-4 | 910 | 2.1 | 49.3 | 0.5 | 0.3 |
| SVE-6 | 9600 | 18.0 | 47.8 | 1.3 | 0.7 |
| SVE-8 | 7650 | 15.0 | 48 | 0.4 | 0.2 |
| SVE-10 | 8050 | 7.5 | 48.9 | 0.1 | 0.1 |

**DATE:** 5/6/2010

| Well | Velocity (ft/min) | Vacuum (inches $H_2O$) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|
| SVE-2 | 1950 | 7.5 | 52.5 | 0.7 | 0.4 |
| SVE-4 | 3080 | 11.0 | 50.5 | 1.2 | 0.7 |
| SVE-6 | 2270 | 13.0 | 49.2 | 2.2 | 1.3 |
| SVE-8 | 4970 | 11.0 | 49.1 | 1 | 0.6 |
| SVE-10 | 1570 | 6.0 | 51.0 | 0.1 | 0.1 |

**DATE:** 7/9/2010

| Well | Velocity (ft/min) | Vacuum (inches $H_2O$) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|
| SVE-2 | 2120 | 6.0 | 60.6 | 0.9 | 0.5 |
| SVE-4 | 6100 | 10.0 | 59.7 | 0.7 | 0.4 |
| SVE-6 | 6850 | 11.0 | 66.2 | 2 | 1.1 |
| SVE-8 | 4560 | 9.5 | 61.6 | 0.4 | 0.2 |
| SVE-10 | 5850 | 6.0 | 60.0 | 0.4 | 0.2 |

**DATE:** 9/7/2010

| Well | Velocity (ft/min) | Vacuum (inches $H_2O$) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|
| SVE-2 | 1900 | 6.0 | 58.3 | 2.6 | 1.5 |
| SVE-4 | 4200 | 9.5 | 56.8 | 4.1 | 2.3 |
| SVE-6 | 5300 | 11.0 | 56.9 | 4.9 | 2.8 |
| SVE-8 | 5750 | 9.0 | 55 | 1.5 | 0.9 |
| SVE-10 | 1920 | 5.0 | 56.4 | 0.9 | 0.5 |

**DATE:** 11/1/2010

| Well | Velocity (ft/min) | Vacuum (inches $H_2O$) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|
| SVE-2 | 2185 | 6.0 | 57.1 | 0.2 | 0.1 |
| SVE-4 | 4370 | 10.0 | 55.9 | 0 | 0.0 |
| SVE-6 | 7175 | 12.0 | 57.5 | 0.3 | 0.2 |
| SVE-8 | 4775 | 11.0 | 55.9 | 0 | 0.0 |
| SVE-10 | 1700 | 5.0 | 56.0 | 0 | 0.0 |

Notes:

[1] - Direct reading from photoionization detector (PID) equipment

[2] - Value adjusted using the 0.57 correction factor for tetrachloroethylene (PCE)

*System Effluent Monitoring*
*MVSC/Harris Properties SVE System*
*Normandy Park, WA*

| Date | Operating Well Group | Time | Differential Pressure (inches H2O) | Vacuum (inches H2O) | Temp (deg F) | PID ppm | PCE Result ppbv | ug/m3 |
|---|---|---|---|---|---|---|---|---|
| 8-Sep-09 | A | 1224 | 3.8 | NM | 99 | 15.4 | 11,000 | 74,000 |
| 10-Sep-09 | A | 1144 | 3.8 | NM | 117 | 12.1 | 10,000 | 69,000 |
| 14-Sep-09 | A | 1216 | NM | 9 | 100 | 8.5 | 1,300 | 8,500 |
| 18-Sep-09 | A | 915 | NM | 10 | 94 | 5.4 | 8,000 | 54,000 |
| 25-Sep-09 | A | 1604 | 4 | 10.3 | 111 | 4.1 | 2,600 | 18,000 |
| 2-Oct-09 | A | 1511 | 4.1 | 8.5 | 97 | 4.4 | 3,700 | 25,000 |
| 10-Nov-09 | B | 930 | 4.1 | 16 | 85 | 1.1 | 1,200 | 8,100 |
| 10-Dec-09 | A | 1038 | 4.6 | 15 | 59 | 1.1 | 800 | 5,500 |
| 10-Dec-09 | B | 1350 | NS | NS | NS | NS | 870 | 5,900 |
| 11-Jan-09 | B | 1202 | 4.2 | 25 | 86 | 0.9 | 830 | 5,700 |
| 11-Jan-09 | A | 1240 | NS | NS | NS | NS | 240 | 1,600 |
| 8-Feb-10 | A | 1130 | 4.3 | 17 | 85 | 1.3 | 610 | 4,100 |
| 8-Feb-10 | B | 1210 | NS | NS | NS | NS | 670 | 4,600 |
| 8-Mar-10 | B | 1010 | 4.2 | 23 | 83 | 0.7 | 860 | 5,800 |
| 8-Mar-10 | A | 1056 | NS | NS | NS | NS | 190 | 1,300 |
| 5-Apr-10 | A | 1207 | 4.4 | 17.5 | 88 | 0.1 | 730 | 5,000 |
| 5-Apr-10 | B | 1238 | NS | NS | NS | NS | 190 | 1,300 |
| 6-May-10 | B | 1207 | 4.4 | 17.5 | 88 | 0.1 | 140 | 960 |
| 6-May-10 | A | 1238 | NS | NS | NS | NS | 940 | 6,400 |
| 4-Jun-10 | A | 1027 | 4.2 | 11 | 92 | 23.2 | 480 | 3,300 |
| 4-Jun-10 | B | 1223 | NS | NS | NS | NS | 400 | 2,700 |
| 9-Jul-10 | B | 1005 | 4.1 | 15 | 104 | 0.8 | 110 | 750 |
| 9-Jul-10 | A | 1121 | NS | NS | NS | NS | 180 | 1200 |
| 6-Aug-10 | A | 1100 | 4.1 | 10 | 98 | 0.9 | 900 | 6,100 |
| 6-Aug-10 | B | 1211 | NS | NS | NS | NS | 520 | 3,500 |
| 7-Sep-10 | B | 1030 | 4.1 | 14.5 | 100 | 1.4 | 590 | 4,000 |
| 7-Sep-10 | A | 1141 | NS | NS | NS | NS | 270 | 1,800 |
| 5-Oct-10 | A | 1135 | 4 | 11 | 90 | 22.9 | 610 | 4,100 |
| 5-Oct-10 | B | 1246 | NS | NS | NS | NS | 280 | 1,900 |
| 1-Nov-10 | B | 1500 | 4.4 | 18 | 90 | 0.1 | 320 | 2,100 |
| 1-Nov-10 | C | 1615 | NS | NS | NS | NS | 260 | 1,800 |

Note:
NM - not measured due to field oversight
NS = Not sampled; the additional effluent sample was collected from the indicated Well Group after allowing the system to stabilize for approximately one half hour.

*Vacuum Readings*
*MVSC/Harris Properties SVE System*
*Normandy Park, WA*

| Probe/Well Date | Operating Well Group | VMP-1 | VMP-2 | VMP-3 | VMP-4 | VMP-5 | VMP-6 | DC-1 | DC-19 |
|---|---|---|---|---|---|---|---|---|---|
| 8-Sep-09 | A | 0.01 | 0.31 | 0.28 | 0.22 | 0.16 | 0.8 | 0.27 | 0.5 |
| 10-Sep-09 | A | 0.04 | 0.32 | 0.28 | 1.1 | 0.18 | 1.2 | 0.33 | 0.58 |
| 14-Sep-09 | A | 0.04 | 0.32 | 0.25 | 1.1 | 0.19 | 1.2 | 0.32 | 0.56 |
| 18-Sep-09 | A | 0.01 | 0.34 | 0.25 | 1.1 | 0.18 | 1.2 | 0.26 | 0.45 |
| 25-Sep-09 | A | 0.01 | 0.33 | 0.27 | 1.15 | 0.14 | 1.2 | 0.26 | 0.53 |
| 2-Oct-09 | A | 0.01 | 0.32 | 0.24 | 1.1 | 0.26 | 1.2 | 0.28 | 0.55 |
| 10-Nov-09 | B | 0.03 | 0.28 | 0.5 | 0.4 | 0.7 | 0.5 | 0.28 | 0.38 |
| 10-Dec-09 | A | * | 0.35 | 0.28 | 1.2 | 0.26 | 1.6 | 0.29 | 0.5 |
| 11-Jan-10 | B | 0 | 0.43 | 0.59 | 0.26 | 0.63 | 0.56 | 0.2 | 0.42 |
| 8-Feb-10 | A | 0.04 | 0.42 | 0.13 | 0.18 | 0.12 | 1.2 | 0.36 | 0.81 |
| 8-Mar-10 | B | 0.03 | 0.4 | 0.6 | 0.17 | 0.27 | 0.59 | 0.39 | 0.58 |
| 5-Apr-10 | A | 0.01 | 0.44 | 0.23 | 1 | 0.24 | 1.4 | 0.05 | 0.89 |
| 6-May-10 | B | 0.1 | 0.35 | 0.49 | 0.3 | 0.61 | 0.52 | 0 | 0.36 |
| 4-Jun-10 | A | 0.07 | 0.19 | 0.4 | 1.4 | 0.28 | 1.5 | 0 | 0.76 |
| 9-Jul-10 | B | 0.01 | 0.34 | 0.48 | 0.3 | 0.53 | 0.45 | 0.005 | 0.4 |
| 6-Aug-10 | A | 0.04 | 0.3 | 0.28 | 1 | 0.2 | 1.4 | 0 | 0.56 |
| 7-Sep-10 | B | 0.04 | 0.32 | 0.43 | 0.32 | 0.46 | 0.39 | 0 | 0.34 |
| 5-Oct-10 | A | 0.015 | 0.34 | 0.28 | 0.93 | 0.2 | 1.2 | 0.34 | 0.58 |
| 1-Nov-10 | B | 0 | 0.37 | 0.49 | 0.5 | 0.62 | 0.52 | 0.46 | 0.66 |

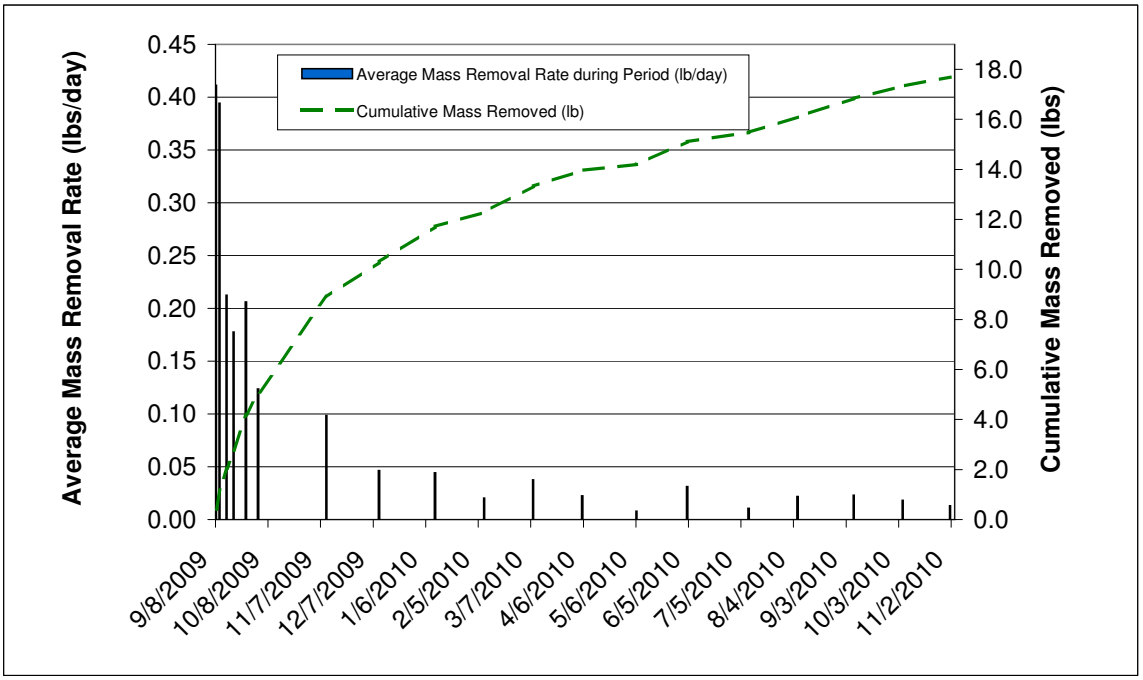
Note:
Vacuum readings in inches of water
* = Could not be sampled due to ice in the well casing

*Attachment D*
*Tetrachloroethene Mass Removal Calculations*

*PCE Mass Removal Calculations*
*MVSC/Harris Properties SVE System*
*Normandy Park, Washington*

| Date | Well Group Operating | Effluent Vapor Concentration (ug/m3) | Flowrate (scfm) | Mass Removal Rate[1] (lb/day) | Average Mass Removal Rate during Period[2] (lb/day) | Period End Date | Mass Removed During Period[3] (lb) | Cumulative Mass Removed (lb) |
|---|---|---|---|---|---|---|---|---|
| 9/8/2009 | A | 74,000 | 62 | 0.41 | 0.41 | 9/8/2009 | 0.4 | 0.4 |
| 9/10/2009 | A | 69,000 | 61 | 0.38 | 0.39 | 9/10/2009 | 0.8 | 1.2 |
| 9/14/2009 | A | 8,500 | 62 | 0.05 | 0.21 | 9/14/2009 | 0.8 | 2.0 |
| 9/18/2009 | A | 54,000 | 64 | 0.31 | 0.18 | 9/18/2009 | 0.7 | 2.8 |
| 9/25/2009 | A | 18,000 | 65 | 0.10 | 0.21 | 9/25/2009 | 1.4 | 4.2 |
| 10/2/2009 | A | 25,000 | 64 | 0.14 | 0.12 | 10/2/2009 | 0.9 | 5.1 |
| 11/10/2009 | B | 8,100 | 74 | 0.05 | 0.10 | 11/10/2009 | 3.8 | 8.9 |
| 12/10/2009 | A | 5,500 | 79 | 0.04 | 0.05 | 12/10/2009 | 1.4 | 10.3 |
| 12/10/2009 | B | 5,900 | 85 | 0.04 | 0.04 | 1/11/2010 | 1.4 | 11.7 |
| 1/11/2010 | B | 5,700 | 85 | 0.04 | | | | |
| 1/11/2010 | A | 1,600 | 85 | 0.01 | 0.02 | 2/8/2010 | 0.6 | 12.3 |
| 2/8/2010 | A | 4,100 | 77 | 0.03 | | | | |
| 2/8/2010 | B | 4,600 | 77 | 0.03 | 0.04 | 3/8/2010 | 1.0 | 13.3 |
| 3/8/2010 | B | 5,800 | 83 | 0.04 | | | | |
| 3/8/2010 | A | 1,300 | 83 | 0.01 | 0.02 | 4/5/2010 | 0.6 | 14.0 |
| 4/5/2010 | A | 5,000 | 78 | 0.03 | | | | |
| 4/5/2010 | B | 1,300 | 78 | 0.01 | 0.01 | 5/6/2010 | 0.2 | 14.2 |
| 5/6/2010 | B | 960 | 74 | 0.01 | | | | |
| 5/6/2010 | A | 6,400 | 74 | 0.04 | 0.03 | 6/4/2010 | 0.9 | 15.1 |
| 6/4/2010 | A | 3,300 | 68 | 0.02 | | | | |
| 6/4/2010 | B | 2,700 | 68 | 0.02 | 0.01 | 7/9/2010 | 0.4 | 15.5 |
| 7/9/2010 | B | 750 | 72 | 0.005 | | | | |
| 7/9/2010 | A | 1,200 | 72 | 0.01 | 0.02 | 8/6/2010 | 0.6 | 16.1 |
| 8/6/2010 | A | 6,100 | 66 | 0.04 | | | | |
| 8/6/2010 | B | 3,500 | 66 | 0.02 | 0.02 | 9/7/2010 | 0.7 | 16.8 |
| 9/7/2010 | B | 4,000 | 71 | 0.03 | | | | |
| 9/7/2010 | A | 1,800 | 71 | 0.01 | 0.02 | 10/5/2010 | 0.5 | 17.3 |
| 10/5/2010 | A | 4,100 | 67 | 0.02 | | | | |
| 10/5/2010 | B | 1,900 | 67 | 0.01 | 0.01 | 11/1/2010 | 0.4 | 17.7 |
| 11/1/2010 | B | 2,100 | 79 | 0.01 | | | | |
| 11/1/2010 | C | 1,800 | 79 | 0.01 | a | December 2010 | a | a |
| **TOTAL** | | - | - | - | - | - | **17.7** | **17.7** |

Notes:
[1]Mass Removal = [flowrate (scfm) x PCE Concentration (ug/m3) x 0.0283168 (m3/cf) x 2.2E-9 (lb/ug) x 1440 (minutes/day)
[2] Average mass removal rate is calculated based on beginning and end of period vapor concentrations.
[3] Initial period assumes startup on 9/8/2009 (1 day).
[a] - Effluent concentration from this sample will be used in mass removal rate calcualtion for following operating period.



*Attachment 2*
*March 2010 Groundwater Sampling Event Report*

**ERM Remediation & Construction Management West, Inc.**

915 - 118th Avenue S.E.
Suite 130
Bellevue, WA 98005
(425) 462-8591
(425) 455-3573 (fax)

30 April 2010

Mr. Ken Lederman
Riddell Williams P.S.
1001 Fourth Avenue Plaza, Suite 4500
Seattle, Washington 98154-1065

Mr. Robert L. DiJulio
Wolfstone, Panchot & Bloch, P.S., Inc.
1111 Third Avenue, Suite 1800
Seattle, Washington 98101

Subject: 2010 Semiannual Groundwater Monitoring Report
Harris/Manhattan Village Shopping Center
Normandy Park, Washington

Dear Messrs. Lederman and Mr. DiJulio:

This report summarizes the semiannual groundwater monitoring activities completed by ERM Remediation & Construction Management West, Inc. (ERM) in March 2010 at the Mountain Harris/Manhattan Village Shopping Center site in Normandy Park, Washington (the "Site"). These activities were completed in accordance with the *Final Soil Vapor Extraction Interim Remedial Action Design and Work Plan* dated March 2009 ("Work Plan"). The location of the Site is shown in Figure 1.

Although soil cleanup is the primary objective of the soil vapor extraction (SVE) interim action (IA), previous remedial efforts at the Site have indicated that the IA may reduce PCE concentrations in groundwater. Therefore, sampling and analysis of groundwater was completed to evaluate groundwater quality during SVE system operation. Seven monitoring wells were selected for inclusion in the semiannual groundwater sampling event due to their location within the radius of influence of the SVE wells. The locations of the seven monitoring wells are shown on Figure 2.

## *SCOPE OF WORK*

In March 2010, groundwater monitoring was performed to evaluate Site conditions relative to the operation of the SVE system. The groundwater monitoring activities included:

- Measurement of static groundwater levels in seven monitoring wells (DC-3, DC-4, DC-11, DC-13, KMW-2, KMW-9 and MW-4);
- Collection of groundwater samples from seven monitoring wells; and
- Laboratory analysis of the samples for chlorinated volatile organic compounds by USEPA (United States Environmental Protection Agency) Method 8260B.

## *GROUNDWATER MONITORING PROCEDURES AND RESULTS*

### *Static Groundwater Levels*

On 8 March 2010, groundwater levels were measured in the seven monitoring wells using an electric water level indicator. A summary of groundwater level measurements is included in Table 1.

### *Groundwater Sampling*

Monitoring well purging and sampling at each well was completed on 8 and 9 March 2010 using a bladder pump and low-flow techniques as described in the *Soil Vapor Extraction Interim Action Compliance Monitoring Plan* dated July 2009. The bladder pump was decontaminated and fitted with new polyethylene tubing prior to installation into each well. The groundwater samples were collected directly from the pump discharge tubing.

Each sample container was labeled with the sample location, sample identification number, date, and time. The samples were transported on ice to ALS Laboratory Group's facility in Everett, Washington, for analysis. Chain-of-custody procedures were followed during sample preparation, shipment, and handling. Chain-of-custody and laboratory quality assurance/quality control documentation is included with the laboratory data sheets in Attachment A.

## *ANALYTICAL RESULTS*

Analytical results for PCE in the groundwater samples are summarized in Table 2 and are illustrated on Figure 3. The common PCE degradation products trichloroethene, dichloroethene isomers, and vinyl chloride were not detected in the groundwater samples collected in March 2010. Tetrachloroethene (PCE) was detected above the MTCA Method A Cleanup Level of 5 parts per billion in four monitoring wells: MW-4, KMW-2, DC-4, and DC-13. PCE was detected in two monitoring wells (KMW-9 and DC-11) at concentrations less than the MTCA Method A Cleanup Level. PCE was not detected in the groundwater sample collected from monitoring well DC-3.

## *ANALYSIS AND CONCLUSIONS*

PCE concentrations in groundwater have decreased since SVE system startup in October 2009. Every well sampled during the March 2010 event revealed a reduction in concentration from the previous sampling event at each well, either in April 2007 or April 2008. These reductions ranged from 15 to greater than 90 percent, with an average of approximately 60 percent reduction in PCE concentration. Three of the seven wells sampled dropped below the MTCA Method A Cleanup Level during the April 2010 event, however, it should be noted that PCE concentrations at Well DC-3 have been observed below the MTCA Method A Cleanup Level during prior sampling events.

Based on available groundwater quality data from 1999 to the present, trends in groundwater quality data over the last several years indicate that significant variability in PCE concentrations over time is common in groundwater at each well (Figure 4). It is possible, therefore, that the decreases in PCE concentrations observed between April 2009 and March 2010 may be related to factors other than the operation of the SVE system. However, given that significant reductions in PCE concentrations were observed in groundwater in the vicinity of the SVE system operated by SCS in 1999-2000, it is ERM's opinion that the operation of the SVE system is likely contributing to the decrease of PCE concentrations in groundwater between April 2009 and March 2010.

We appreciate the opportunity to provide you with ongoing environmental consulting and remediation services. Please call Mike Arnold at 425.214.0454 or Erik Ipsen at 503.488.5014 if you have questions regarding this groundwater monitoring report.

Sincerely,

A. Michael Arnold, R.G., R.H.G.
*Senior Project Manager*

Erik C. Ipsen, P.E.
*Partner*

AMA/ECI/jjr/0099467.03

Attachments

*Figures*

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Drawn By: R.O./C.T.
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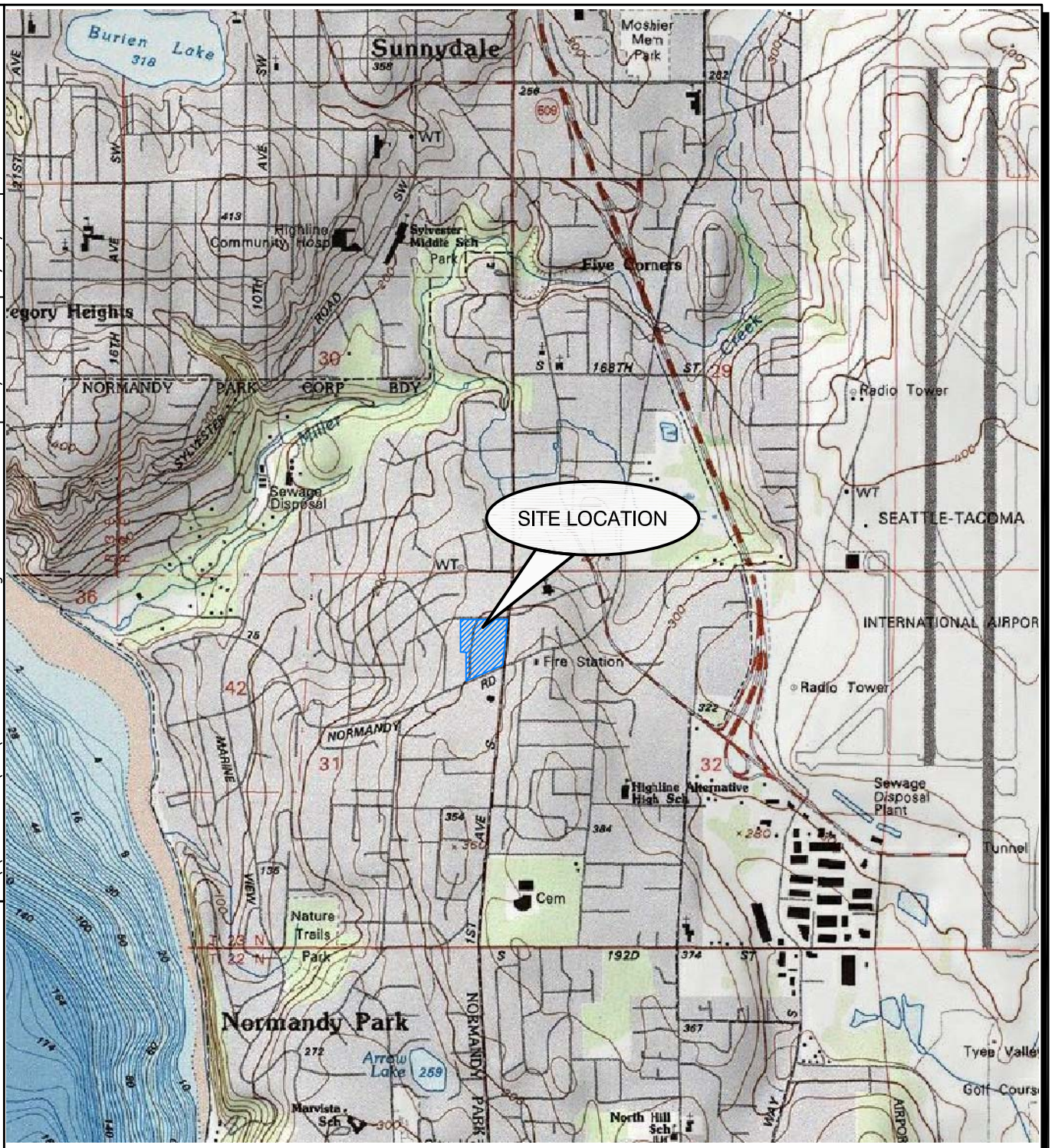


SCALE 1: 24,000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

N

References:
TOPO!® Software
U.S.G.S. 7.5 Minute Series (Topographic) Quadrangle, Des Moines, WA
Version: 1995; Current: 1990

Figure 1
*Site Location Map*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM *11/08*

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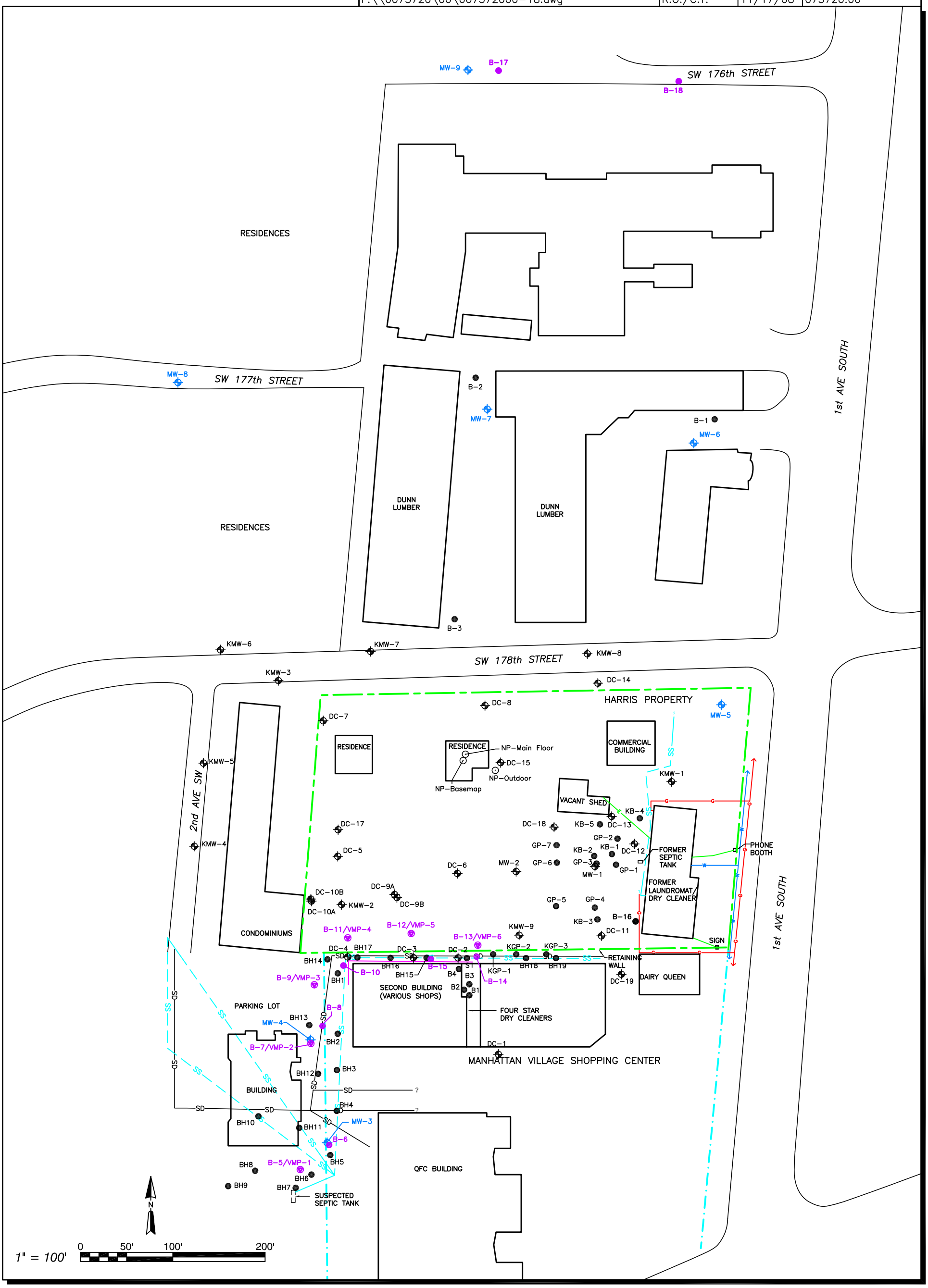


LEGEND

- Monitoring Well
- Soil Boring
- Soil Vapor Extraction Well
- Domestic Well
- Storm Water Catch Basin
- Monitoring Well, Installed 2008
- Soil Boring, Completed 2008
- Soil Vapor Probe, Installed 2008
- Air Sample, Collected 2008

- Approximate Harris Property Boundary
- Approximate Manhatten Plaza Shopping Center Property Boundary
- Underground Electrical Utility
- Underground Natural Gas Utility
- Underground Sewer Utility
- Underground Storm Drain Utility
- Underground Water Utility

# Figure 2
*Site Plan*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM 11/08

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| g:\\0099467\03\009946703-01.dwg | R. Olson | 04/26/10 | 0099467.03 |

N

0 50' 100' 200'

1" = 100'

RESIDENCES

MW-9

SW 176th STREET

1st AVE SOUTH

MW-8

SW 177th STREET

MW-7

MW-6

DUNN LUMBER

DUNN LUMBER

RESIDENCES

KMW-6

KMW-7

SW 178th STREET

KMW-8

KMW-3

DC-14

HARRIS PROPERTY

DC-8

MW-5

DC-7

KMW-5D

KMW-5

RESIDENCE

RESIDENCE

DC-15

COMMERCIAL BUILDING

KMW-1

2nd AVE SW

VACANT SHED

DC-17

DC-13 10

DC-18

DC-12

KMW-4

DC-16

DC-5

FORMER SEPTIC TANK

PHONE BOOTH

DC-6

MW-2

MW-1

FORMER LAUNDROMAT/ DRY CLEANER

DC-10B

DC-9A

KMW-2 81

DC-9B

DC-10A

CONDOMINIUMS

KMW-9 4.4

DC-11 4.6

SIGN

DC-4 9.2

DC-3 <2.0

DC-2

RETAINING WALL

DC-19

FORMER DAIRY QUEEN

SECOND BUILDING (VARIOUS SHOPS)

FOUR STAR DRY CLEANERS

PARKING LOT

MW-4 7.8

DC-1

MANHATTAN VILLAGE SHOPPING CENTER

BUILDING

MW-3

SUSPECTED SEPTIC TANK

QFC BUILDING

LEGEND

- Monitoring Well
- Shallow Monitoring Well
- Deep Monitoring Well
- 50.8 PCE Concentration (µg/L)
- Grayed symbols were not sampled.
- Storm Water Catch Basin
- Approximate Harris Property Boundary
- Approximate Manhattan Village Shopping Center Property Boundary
- Underground Electrical Utility
- Underground Natural Gas Utility
- Underground Sewer Utility
- Underground Storm Drain Utility
- Underground Water Utility

Figure 3

*PCE in Groundwater - March 2010*

*MVSC/Harris Properties*

*Normandy Park, Washington*

ERM 04/10

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
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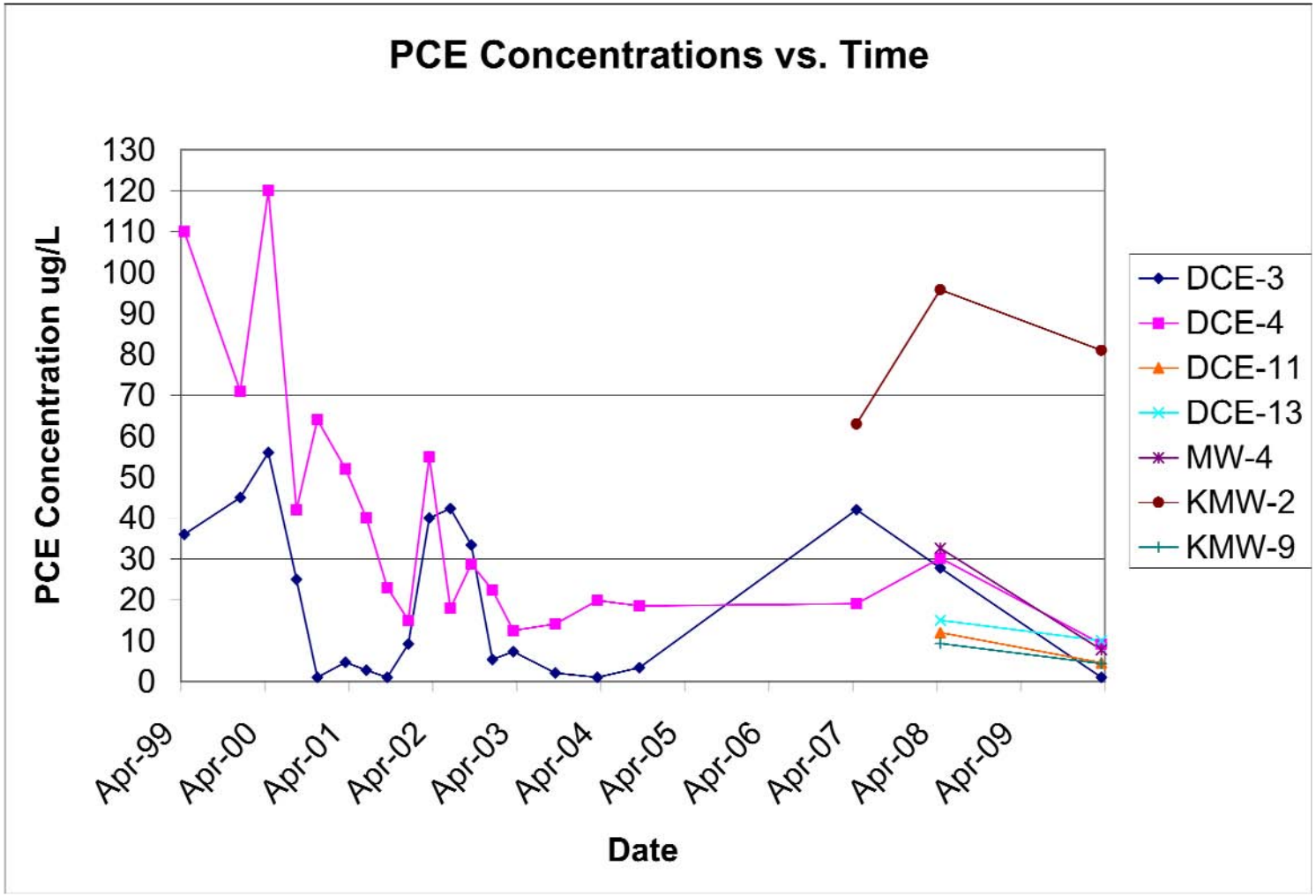


Figure 4

*PCE Concentrations in Groundwater 1999-2010*

*MVSC/Harris Properties*

*Normandy Park, Washington*

ERM 04/10

*Tables*

**Table 1**

*Water Levels - 10 March 2010*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Location | Well Casing Elevation (feet amsl) | Depth to Water (feet below well casing) | Water Level Elevation (feet amsl) |
|---|---|---|---|
| MW-4 | 310.54 | 38.66 | 271.88 |
| DC-3 | 313.23 | 41.53 | 271.70 |
| DC-4 | 312.12 | 40.74 | 271.38 |
| DC-11 | 311.02 | 39.54 | 271.48 |
| DC-13 | 310.85 | 38.82 | 272.03 |
| KMW-2 | 306.90 | 35.56 | 271.34 |
| KMW-9 | 310.18 | 38.77 | 271.41 |

**Table 2**

*Tetrachloroethene Concentrations in Groundwater*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (micrograms per liter) |
|---|---|---|
| MW-4 | 3/9/2010 | **7.8** |
| | 4/14/2008 | **32.6** |
| KMW-2 | 3/8/2010 | **81** |
| | 4/16/2008 | **95.8** |
| | 4/24/2007 | **63** |
| KMW-9 | 3/8/2010 | **4.4** |
| | 4/26/2007 | **9.3** |
| DC-3 | 3/9/2010 | <2 |
| | 4/14/2008 | **27.8** |
| | 4/26/2007 | **42** |
| | 9/7/2004 | **3.4** |
| | 3/16/2004 | <2 |
| | 9/3/2003 | **2.1** |
| | 3/31/2003 | **7.3** |
| | 12/10/2002 | **5.4** |
| | 9/17/2002 | **33.4** |
| | 6/13/2002 | **42.3** |
| | 3/13/2002 | **40** |
| | 12/20/2001 | **9.2** |
| | 9/17/2001 | <2 |
| | 6/20/2001 | **2.8** |
| | 3/6/2001 | **4.7** |
| | 11/14/2000 | <2 |
| | 8/3/2000 | **25** |
| | 4/26/2000 | **56** |
| | 12/8/1999 | **45** |
| | 4/7/1999 | **36** |

**Table 2**

*Tetrachloroethene Concentrations in Groundwater*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (micrograms per liter) |
|---|---|---|
| DC-4 | 3/9/2010 | **9.2** |
| | 4/14/2008 | **30.2** |
| | 4/26/2007 | **19** |
| | 9/7/2004 | **18.5** |
| | 3/16/2004 | **19.8** |
| | 9/3/2003 | **14.1** |
| | 3/31/2003 | **12.5** |
| | 12/10/2002 | **22.4** |
| | 9/17/2002 | **28.8** |
| | 6/13/2002 | **17.9** |
| | 3/13/2002 | **55** |
| | 12/20/2001 | **15** |
| | 9/17/2001 | **23** |
| | 6/20/2001 | **40** |
| | 3/6/2001 | **52** |
| | 11/14/2000 | **64** |
| | 8/3/2000 | **42** |
| | 4/26/2000 | **120** |
| | 12/8/1999 | **71** |
| | 4/7/1999 | **110** |
| DC-11 | 3/9/2010 | **4.6** |
| | 4/26/2007 | **12** |
| DC-13 | 3/1/2010 | **10** |
| | 4/16/2008 | **23** |
| | 4/25/2007 | **15** |
| Model Toxics Control Act Method A Groundwater Cleanup Level | | 5 |

**Notes:**

**Bold** entries indicate positive analyte detections.

Shaded cells indicate concentrations greater than the cleanup goal

*Attachment A*
*Laboratory Data Report*

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/8/2010 KMW-9-030810
ALS SAMPLE #: -01

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | 4.4 | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |



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## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/8/2010 KMW-9-030810
ALS SAMPLE #: -01

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMT.
** UNITS FOR ALL NON-LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS.

APPROVED BY:

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## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/8/2010 KMW-2-030810
ALS SAMPLE #: -02

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | 81 | 10 | 5 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |



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DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/8/2010 KMW-2-030810
ALS SAMPLE #: -02

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

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## CERTIFICATE OF ANALYSIS

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DATE: 3/18/2010
ALS JOB#: 1003050
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WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/8/2010 DC-13-030810
ALS SAMPLE #: -03

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | 10 | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |



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DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/8/2010 DC-13-030810
ALS SAMPLE #: -03

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

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## CERTIFICATE OF ANALYSIS

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DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 DC-11-030910
ALS SAMPLE #: -04

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | 4.6 | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

## CERTIFICATE OF ANALYSIS

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Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 DC-11-030910
ALS SAMPLE #: -04

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMT.
** UNITS FOR ALL NON-LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS.

APPROVED BY:

8620 Holly Drive Suite 100 Everett, WA 98208 425 356-2600 FAX 425 356-2626 Seattle 206 292-9059

## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 DC-3-030910
ALS SAMPLE #: -05

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |



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## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
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DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 DC-3-030910
ALS SAMPLE #: -05

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

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## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 DC-4-030910
ALS SAMPLE #: -06

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | 9.2 | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |



8620 Holly Drive Suite 100 Everett, WA 98208 425 356-2600 FAX 425 356-2626 Seattle 206 292-9059

## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 DC-4-030910
ALS SAMPLE #: -06

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

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APPROVED BY:

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## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 MW-4-030910
ALS SAMPLE #: -07

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Vinyl Chloride | EPA-8260 | ND | 0.20 | 1 | UG/L | 3/11/2010 | CCN |
| Bromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichlorofluoromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Methylene Chloride | EPA-8260 | ND | 5.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chloroform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Carbon Tetrachloride | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trichloroethene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromomethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromodichloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3-Dichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Tetrachloroethylene | EPA-8260 | 7.8 | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Dibromochloromethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromoethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Chlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromoform | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Bromobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 2-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 4-Chlorotoluene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |



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## CERTIFICATE OF ANALYSIS

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DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling
CLIENT SAMPLE ID: 3/9/2010 MW-4-030910
ALS SAMPLE #: -07

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 10 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| Hexachlorobutadiene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 2.0 | 1 | UG/L | 3/11/2010 | CCN |

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## CERTIFICATE OF ANALYSIS

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DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling

## QUALITY CONTROL RESULTS

**SURROGATE RECOVERY**

| ALS SAMPLE ID | METHOD | SUR ID | % RECV |
|---|---|---|---|
| 1003050-01 | EPA-8260 | 1,2-Dichloroethane-d4 | 108% |
| 1003050-01 | EPA-8260 | 4-Bromofluorobenzene | 104% |
| 1003050-02 | EPA-8260 | 1,2-Dichloroethane-d4 | 111% |
| 1003050-02 | EPA-8260 | 4-Bromofluorobenzene | 103% |
| 1003050-02 5X Dilution | EPA-8260 | 1,2-Dichloroethane-d4 | 109% |
| 1003050-02 5X Dilution | EPA-8260 | 4-Bromofluorobenzene | 101% |
| 1003050-03 | EPA-8260 | 1,2-Dichloroethane-d4 | 110% |
| 1003050-03 | EPA-8260 | 4-Bromofluorobenzene | 103% |
| 1003050-04 | EPA-8260 | 1,2-Dichloroethane-d4 | 112% |
| 1003050-04 | EPA-8260 | 4-Bromofluorobenzene | 101% |
| 1003050-05 | EPA-8260 | 1,2-Dichloroethane-d4 | 111% |
| 1003050-05 | EPA-8260 | 4-Bromofluorobenzene | 103% |
| 1003050-06 | EPA-8260 | 1,2-Dichloroethane-d4 | 110% |
| 1003050-06 | EPA-8260 | 4-Bromofluorobenzene | 102% |
| 1003050-07 | EPA-8260 | 1,2-Dichloroethane-d4 | 110% |
| 1003050-07 | EPA-8260 | 4-Bromofluorobenzene | 102% |

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CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling

## QUALITY CONTROL RESULTS

**BLANK RESULTS**

| QC SAMPLE ID | MATRIX | METHOD | ANALYTE | RESULT | UNITS |
|---|---|---|---|---|---|
| MB-031110W | Water | EPA-8260 | Dichlorodifluoromethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Chloromethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Vinyl Chloride | ND(<0.20) | UG/L |
| MB-031110W | Water | EPA-8260 | Bromomethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Chloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Trichlorofluoromethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Carbon Tetrachloride | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1-Dichloroethene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Methylene Chloride | ND(<5.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Trans-1,2-Dichloroethene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1-Dichloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Cis-1,2-Dichloroethene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 2,2-Dichloropropane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Bromochloromethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Chloroform | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1,1-Trichloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1-Dichloropropene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2-Dichloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Trichloroethene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2-Dichloropropane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Dibromomethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Bromodichloromethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Trans-1,3-Dichloropropene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Toluene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Cis-1,3-Dichloropropene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1,2-Trichloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,3-Dichloropropane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Tetrachloroethylene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Dibromochloromethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2-Dibromoethane | ND(<0.010) | UG/L |
| MB-031110W | Water | EPA-8260 | Chlorobenzene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1,1,2-Tetrachloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Bromoform | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,1,2,2-Tetrachloroethane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2,3-Trichloropropane | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Bromobenzene | ND(<2.0) | UG/L |



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## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling

## QUALITY CONTROL RESULTS

**BLANK RESULTS**

| QC SAMPLE ID | MATRIX | METHOD | ANALYTE | RESULT | UNITS |
|---|---|---|---|---|---|
| MB-031110W | Water | EPA-8260 | 2-Chlorotoluene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 4-Chlorotoluene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,3 Dichlorobenzene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,4-Dichlorobenzene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2-Dichlorobenzene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2-Dibromo 3-Chloropropane | ND(<10) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2,4-Trichlorobenzene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | Hexachlorobutadiene | ND(<2.0) | UG/L |
| MB-031110W | Water | EPA-8260 | 1,2,3-Trichlorobenzene | ND(<2.0) | UG/L |

APPROVED BY:

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## CERTIFICATE OF ANALYSIS

CLIENT: ERM
915 118th Ave. SE
Suite 130
Bellevue, WA 98005

DATE: 3/18/2010
ALS JOB#: 1003050
DATE RECEIVED: 3/10/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT ID: Normandy Park GW Sampling

## QUALITY CONTROL RESULTS

**BLANK SPIKE/BLANK SPIKE DUPLICATE RESULTS**

| QC BATCH ID | MATRIX | METHOD | ANALYTE | SPIKE AMOUNT | BLANK SPIKE RECOVERY | BLANK SPIKE DUPLICATE RECOVERY | RPD |
|---|---|---|---|---|---|---|---|
| 598 | Water | EPA-8260 | 1,1-Dichloroethene | 10 | 89% | 84% | 5 |
| 598 | Water | EPA-8260 | Trichloroethene | 10 | 81% | 78% | 4 |
| 598 | Water | EPA-8260 | Toluene | 10 | 83% | 79% | 4 |
| 598 | Water | EPA-8260 | Chlorobenzene | 10 | 85% | 82% | 4 |

APPROVED BY:

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**ALS Laboratory Group**
8620 Holly Drive, Suite 100
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(425) 356-2626 Fax
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# Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): 1003050

Date _____ Page 1 Of 1

PROJECT ID: Normandy Park GW Sampling
REPORT TO COMPANY: ERM-West
PROJECT MANAGER: Mike Arnold
ADDRESS: 915 - 118th Ave, SE Ste 130
Bellevue WA 98005
PHONE: 425 214 0454 FAX:
P.O. NUMBER: 99467.04 E-MAIL: mike.arnold.com
INVOICE TO COMPANY: ERM-West
ATTENTION: Acct Payable
ADDRESS: 1277 Treat BLVD, Ste 500
Walnut Creek 94597

LABORATORY COPY

| SAMPLE I.D. | DATE | TIME | TYPE | LAB# | NWTPH-HCID | NWTPH-DX | NWTPH-GX | BTEX by EPA-8021 | MTBE by EPA-8021 ☐ EPA-8260 ☐ | Halogenated Volatiles by EPA 8260 | Volatile Organic Compounds by EPA 8260 | EDB / EDC by EPA 8260 SIM (water) | EDB / EDC by EPA 8260 (soil) | Semivolatile Organic Compounds by EPA 8270 | Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐ | PCB ☐ Pesticides ☐ by EPA 8081/8082 | Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐ | Metals Other (Specify) | TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐ | OTHER (Specify): Chlorinated VOCs 8260 | | | | | | | NUMBER OF CONTAINERS | RECEIVED IN GOOD CONDITION? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. kMW-9-030810 | 3/8/10 | 1316 | W | 1 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 2. kMW-2-030810 | 3/8/10 | 1425 | W | 2 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 3. DC-13-030810 | 3/8/10 | 1526 | W | 3 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 4. DC-11-030910 | 3/9/10 | 0951 | W | 4 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 5. DC-3-030910 | 3/9/10 | 1120 | W | 5 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 6. DC-4-030910 | 3/9/10 | 1245 | W | 6 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 7. MW-4-030910 | 3/9/10 | 1347 | W | 7 | | | | | | | | | | | | | | | X | | | | | | | 3 | |
| 8. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: _____ ERM 3/9/10 1500
Received By: _____ ALS 3/10/10 1:40
2. Relinquished By: _____
Received By: _____

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: [X] Standard | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: 5 Standard | 3 | 1 | SAME DAY

OTHER:
Specify: _____

* Turnaround request less than standard may incur Rush Charges

*Attachment 3*
*November 2010 Groundwater Sampling*
*Data Summary*

**TABLE 2**

*Volatile Organic Compounds in Groundwater From Wells (2008-2010)*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well Number | Date Sampled | Volatile Organic Compounds[1] (µg/L) | | | | |
|---|---|---|---|---|---|---|
| | | Bromodichloro-methane | Chloroform | cis-1,2-Dichloroethene | Tetrachloro-ethene | Trichloro-ethene |
| MW-3 | 4/14/2008 | <0.200 | **0.990** | <0.200 | **2.31** | <0.200 |
| | 11/1/2010 | <2.0 | <2.0 | <2.0 | **2.9** | <2.0 |
| MW-4 | 4/14/2008 | <0.200 | **0.780** | **0.320** | **32.6** | **0.490** |
| | 3/9/2010 | <2.0 | <2.0 | <2.0 | **7.8** | <2.0 |
| | 11/1/2010 | <2.0 | <2.0 | <2.0 | **16** | <2.0 |
| MW-5 | 4/11/2008 | <0.200 | <0.200 | <0.200 | **0.470** | <0.200 |
| MW-6 | 4/15/2008 | <0.200 | <0.200 | <0.200 | **1.99** | <0.200 |
| MW-7 | 4/16/2008 | <0.200 | **1.12** | <0.200 | **22.4** | <0.200 |
| MW-8 | 8/21/2008 | <0.1 | **0.3 J** | <0.1 | **0.2 J** | <0.1 |
| MW-9 | 8/21/2008 | <0.1 | **0.4 J** | <0.1 | **0.1 J** | <0.1 |
| KMW-1 | 4/14/2008 | <0.200 | **0.450** | <0.200 | <0.200 | <0.200 |
| KMW-2 | 4/16/2008 | <0.200 | **0.640** | <0.200 | **95.8** | **0.230** |
| | 3/8/2010 | <2.0 | <2.0 | <2.0 | **81** | <2.0 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | **74** | <2.0 |
| KMW-3 | 11/2/2010 | <2.0 | <2.0 | <2.0 | **11** | <2.0 |
| KMW-7 | 4/15/2008 | <0.200 | **1.33** | <0.200 | **3.88** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| KMW-8 | 4/15/2008 | **0.310** | **1.13** | <0.200 | **17.4** | <0.200 |
| KMW-9 | 3/8/2010 | <2.0 | <2.0 | <2.0 | **4.4** | <2.0 |
| | 11/4/2010 | <2.0 | <2.0 | <2.0 | **2.8** | <2.0 |
| DC-2 | 4/14/2008 | <0.200 | **1.60** | <0.200 | **0.340** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-3 | 4/14/2008 | <0.200 | **1.50** | <0.200 | **27.8** | <0.200 |
| | 3/9/2010 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-4 | 4/11/2008 | <0.200 | **1.20** | <0.200 | **30.2** | <0.200 |
| | 3/9/2010 | <2.0 | <2.0 | <2.0 | **9.2** | <2.0 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | **13** | <2.0 |
| DC-7 | 4/16/2008 | <0.200 | **1.08** | <0.200 | **50.8** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | **34** | <2.0 |
| DC-8 | 4/16/2008 | <0.200 | **0.370** | <0.200 | **39.4** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | **25** | <2.0 |
| DC-9B | 4/15/2008 | <0.200 | **1.27** | <0.200 | **0.640** | <0.200 |
| DC-10B | 11/3/2010 | <2.0 | <2.0 | <2.0 | **2.6** | <2.0 |
| DC--11 | 3/9/2010 | <2.0 | <2.0 | <2.0 | **4.6** | <2.0 |
| | 11/1/2010 | <2.0 | <2.0 | <2.0 | **4.8** | <2.0 |
| DC-13 | 4/16/2008 | <0.200 | **0.280** | <0.200 | **23.0** | <0.200 |
| | 3/8/2010 | <2.0 | <2.0 | <2.0 | **10** | <2.0 |
| | 11/2/2010 | <2.0 | <2.0 | <2.0 | **9.2** | <2.0 |
| DC-16 | 11/5/2010 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-17 | 4/16/2008 | <0.200 | **0.750** | <0.200 | **74.6** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | **2.1** | <2.0 |
| DC-19 | 4/14/2008 | <0.200 | <0.200 | <0.200 | **0.660** | <0.200 |
| Cleanup Goal | | 0.71[2] | 7.17[2] | 80[3] | 5[4] | 5[4] |

**Notes:**

**Bold** entries indicate positive analyte detections.

Shaded cells indicate concentrations greater than the cleanup goal

[1]Halogenated volatile organic compounds by USEPA Method 8260

[2]Model Toxics Control Act Method B Groundwater Cleanup Level (Carcinogenic)

[3]Model Toxics Control Act Method B Groundwater Cleanup Level (Noncarcinogenic)

[4]Model Toxics Control Act Method A Groundwater Cleanup Level

µg/L = Micrograms per liter

J = Concentration reported as "estimated" by lab

**Environmental Resources Management**

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25 March 2011

Mr. Ken Lederman
Riddell Williams P.S.
1001 Fourth Avenue Plaza, Suite 4500
Seattle, Washington 98154-1065

Mr. Robert L. DiJulio
Wolfstone Panchot & Bloch, P.S., Inc.
1111 Third Avenue, Suite 1800
Seattle, Washington 98101

Subject: November 2010/February 2011 Groundwater Sampling Event and February 2011 Well Installation Report
Harris/Manhattan Village Shopping Center
Normandy Park, Washington

Dear Messrs. Lederman and DiJulio:

This report summarizes monitoring well installation and groundwater sampling activities completed by ERM-West, Inc. (ERM), in November 2010 and February 2011 at the Harris/Manhattan Village Shopping Center site in Normandy Park, Washington (the "site"). These activities were completed pursuant to ERM's proposals of 5 March 2009 and 23 July 2010, and the 1 December 2010 change order proposal. The tasks were also completed in accordance with the *Final Soil Vapor Extraction Interim Remedial Action Design and Work Plan* dated March 2009. The location of the site is shown on Figure 1.

The objectives of the well installation and groundwater monitoring completed during this field program were:

- Replace damaged or missing wells to establish an appropriate monitoring well network to evaluate groundwater conditions during the in situ chemical oxidation (ISCO) pilot test planned for Spring 2011;
- Evaluate groundwater quality as a baseline to the planned ISCO pilot test; and

- Evaluate the effect of the operation of the soil vapor extraction (SVE) system on tetrachloroethene (PCE) concentrations in groundwater.

As part of the groundwater quality evaluation, groundwater samples were collected from seven monitoring wells to evaluate the effect of the SVE system operation on PCE concentrations in groundwater, and groundwater samples were collected from eleven monitoring wells to establish a baseline of water quality conditions with which to evaluate the effectiveness of the planned ISCO pilot test. Samples from several wells were collected for both purposes. Table 1 below indicates which of the eighteen monitoring wells were sampled in conjunction with the SVE effects evaluation and which wells were sampled for the ISCO pilot test baseline. The monitoring well locations are shown on Figure 2.

*Table 1 November/January Field Event Monitoring Wells*

| Project Objective | Monitoring Wells Sampled |
|---|---|
| SVE Evaluation | DC-3*, DC-4*, DC-11, DC-13, KMW-2*, KMW-9, MW-4* |
| ISCO Baseline | DC-2, DC-3*, DC-4*, DC-7, DC-8, DC-10B, DC-16, DC-17, KMW-2*, KMW-3, KMW-7, MW-3, MW-4*, MW-10, MW-11 |

*The samples collected from these monitoring wells are associated with both project objectives

During the November 2010 groundwater sampling activities, ERM was unable to locate monitoring well DC-5 and monitoring well DC-9B appeared to have been damaged by tampering. Both of these wells had been identified as groundwater sampling points for development of baseline data to support the ISCO pilot test. In addition, ERM personnel noted that the protective monuments for wells DC-10B and KMW-2 had been damaged and required replacement.

## *SCOPE OF WORK*

The scope of work completed for the well installation and groundwater monitoring effort included the following tasks:

- Built a graveled roadbed at the site to accommodate operation of drilling vehicles for the well installation and the future ISCO pilot test efforts;
- Replaced the damaged well protection monuments at monitoring wells DC-10B and KMW-2;
- Attempted to remove material obstructing the casing of monitoring well DC-9B using a vacuum truck;
- After well rehabilitation efforts failed, abandoned monitoring well DC-9B in compliance with Washington State Department of Ecology requirements;
- Installed and developed monitoring wells MW-10 and MW-11 to replace monitoring wells DC-5 and DC-9B;
- Collected two soil samples from the soil waste generated during well installation activities and analyze the samples for volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260B;
- Measured static groundwater levels in each of the accessible site monitoring wells; and
- Collected groundwater samples from eighteen monitoring wells and analysis of each sample for VOCs by USEPA Method 8260B, and select samples for dissolved iron, manganese, and potassium by USEPA Method 6010B.

***SITE GRADING***

Site grading and construction of the gravel access road and work area were conducted under the direction of ERM on 31 January 2011 by Custom Backhoe Inc. of Bellevue, Washington. A total of 155 tons of gravel were imported from Renton Concrete Recyclers in Renton, Washington to construct the gravel access road and work areas at the locations of the new wells and the planned ISCO pilot test injections. The weight ticket summary for the delivered gravel is included in Attachment A.

## *UTILITY CLEARANCE*

Subsurface utilities in the vicinity of the proposed monitoring wells were located using the public utility notification system and by a private utility locator (Applied Professional Services of North Bend, Washington. On 2 February 2011, Cascade Drilling Inc. (Cascade) of Woodinville, Washington completed pilot excavations to approximately 5 feet below ground surface (bgs) using a vacuum truck and air knife at the proposed monitoring well locations to confirm that no buried utilities were present.

## *MONITORING WELL REPAIR, REHABILITATION, AND ABANDONMENT*

On 2 February 2011, Cascade replaced the damaged concrete monuments for wells DC-10B and KMW-2. The old monument materials were removed from each well location and a new monument was established and fixed into place with concrete.

Under the direction of ERM, Cascade attempted to rehabilitate monitoring well DC-9B by removing the soil and debris from within the well casing with a vacuum truck. The vacuum hose line was fitted with a 1 ½ inch polyvinyl chloride (PVC) pipe that was inserted into the monitoring well casing. Cascade was able to remove soil and debris from the casing to a total depth of approximately 22 feet bgs. Several attempts were made to advance below 22 feet bgs; however, rocks wedged in the casing prevented further progress.

After well rehabilitation attempts were unsuccessful, monitoring well DC-9B was abandoned in compliance with Washington State Department of Ecology guidelines. The well casing and annular materials were removed by overdrilling the well using a hollow-stem auger rig operated by Cascade. The well was overdrilled to the total reported well depth of 42.5 feet bgs. The resulting borehole was backfilled to the surface with bentonite chips.

## *MONITORING WELL INSTALLATION AND DEVELOPMENT*

### *Monitoring Well Construction*

On 2 February 2011, monitoring wells MW-10 and MW-11 were installed using a truck-mounted hollow-stem auger drilling rig operated by Cascade. During drilling, soil samples for lithologic logging were collected at 5 foot intervals using a driven split spoon sampler. The lithology, drilling observations, and well construction details were recorded on the drilling logs included in Attachment B.

The wells were constructed of 2-inch diameter, threaded, flush-joint, Schedule 40 PVC casing with 10 feet of 0.001-inch machine-slotted PVC screen. Both wells were completed to a depth of 42 feet bgs.

The annular space between the well screen and the borehole wall was backfilled with clean 2/12 silica sand installed to 2 feet above the top of the well screen. Medium bentonite chips were used to fill the annular space above the sand pack to within 3 feet of the ground surface. The remaining annular space was sealed with Portland cement concrete, into which flush-with-grade well protective monuments were set. Each newly-installed well was fitted with a lockable compression cap installed inside the monument.

The wells were developed by pumping water from the well using a submersible pump. Water was removed from each well until water clarity stabilized and turbidity readings decreased to less than 100 nephelometric turbidity units (NTUs), or until 10 well volumes of water were removed, whichever occurred first.

### *Lithology and Soil Observations*

Soils encountered during the installation of well MW-10 and MW-11 were primarily composed of fine to medium sand, with some scattered silt and gravel layers, to the total drilling depth of 42 feet. Groundwater was encountered at approximately 35 feet bgs during drilling of both monitoring wells.

*Surveying*

On 8 February 2011, True North Land Surveying Inc. of Seattle, Washington, a Washington state-licensed land surveyor, surveyed the locations and top of casing elevations of the newly installed monitoring wells (MW-10 and MW-11). The elevation and horizontal position of these wells was obtained from the north rim of each well casing, utilizing Washington State Plane coordinates and elevation. Horizontal locations were established to an accuracy of 0.1 feet and elevations were established to an accuracy of 0.01 inches. The monitoring wells were surveyed relative to the existing site datum. The survey report is included in Attachment C.

*Investigation-Derived Waste Management*

Soil cuttings and decontamination water from the monitoring well abandonment and monitoring well installations were contained in seven labeled, 55-gallon, Department of Transportation-approved steel drums. Two soils samples (MW-10-02032011 and MW-11-02032011) were collected from these drums and submitted to ALS Laboratories for analysis of VOCs by USEPA Method 8260B in order to characterize the waste for disposal. VOCs were not detected in either soil sample. Purge water and the drilling decontamination water were contained in four drums. The waste drums were stored in a secure area of the site pending removal and disposal by Clean Harbors Inc. of SeaTac, Washington.

## *GROUNDWATER MONITORING PROCEDURES*

### *Groundwater Levels*

On 11 February 2011, groundwater levels at each accessible site well were measured using an electric water level indicator.

### *Groundwater Sample Collection*

Groundwater samples were collected from 16 monitoring wells between 1 and 4 November 2010. The groundwater samples from wells MW-10 and MW-11 were collected on 8 February 2011, after those wells had been installed and developed. Well purging and sample collection

during both events were completed using a submersible bladder pump and low-flow techniques as described in the *In Situ Chemical Oxidation Pilot Study Work Plan, Manhattan Village Shopping Center and Harris Properties, Normandy Park, Washington, March 2011* (ERM 2011). The bladder pump was decontaminated and fitted with new polyethylene tubing prior to installation into each well. The groundwater samples were collected directly from the pump discharge tubing after purging was complete.

Each sample container was labeled with the sample location, sample identification number, date, and time. The samples were transported in a cooler with ice to the ALS Laboratory Group facility in Everett, Washington, for analysis. Chain-of-custody procedures were followed during sample preparation, shipment, and handling. Chain-of-custody and laboratory quality assurance/quality control documentation are included with the laboratory data sheets in Attachment D.

## *RESULTS*

### *Water Levels*

A summary of groundwater level measurements from the February field event is included in Table 2. Groundwater elevations developed from the water level measurements and survey information are included on the potentiometric surface map on Figure 3. The inferred groundwater flow direction on 11 February 2011 was toward the north at an average gradient of 0.017. These conditions are consistent with groundwater flow conditions observed during previous groundwater monitoring events.

### *Groundwater Samples*

Analytical results for detected VOCs in groundwater samples collected in November 2010 and February 2011 are summarized in Table 3 and on Figure 4. PCE was detected above the MTCA Method A Cleanup Level of 5 micrograms per liter (µg/L) in groundwater samples from nine monitoring wells (MW-4, MW-10, MW-11, KMW-2, KMW-3, DC-4, DC-7, DC-8, and DC-13). PCE was detected at concentrations less than the MTCA Method A Cleanup Level in groundwater samples from five monitoring wells (MW-3, KMW-9, DC-10B, DC-11, and DC-17). PCE

was not detected in the groundwater samples collected from four monitoring wells (DC-2, DC-3, KMW-7, and DC-16). No other VOCs were detected in groundwater samples.

Analytical results for dissolved metals in groundwater are summarized in Table 4. Groundwater samples from selected wells critical to the baseline assessment for the ISCO pilot test (Table 1) were analyzed for dissolved iron, manganese, and potassium. Iron and manganese were not detected in the groundwater samples from the selected monitoring wells. Potassium was detected in each of the ISCO pilot study monitoring wells at concentrations ranging from 1,400 µg/L to 2,300 µg/L.

## *CONCLUSIONS*

November 2010 PCE concentrations in monitoring wells near the SVE wells decreased in three wells (KMW-2, KMW-9, and DC-13) compared to groundwater quality results from the March 2010 sampling event. PCE concentrations slightly increased in three wells (MW-4, DC-4, and DC-11) and remained undetected in well DC-3. The PCE concentrations in groundwater at these wells remain significantly lower than those measured in 2007 and 2008, prior to startup of the SVE system.

Based on these analytical results, it is inconclusive if the SVE system is continuing to effectively lower PCE concentrations in groundwater. The March 2010 groundwater monitoring results indicated a reduction of PCE concentrations in groundwater in each of the monitoring wells sampled compared to the 2008 groundwater monitoring results; however, the comparison of results between the March 2010 and November 2011 events show an attenuation of the downward trend in PCE concentrations observed in past monitoring events collected during SVE operation.

The November 2010 and February 2011 groundwater results indicate that the distribution and concentrations of PCE in groundwater in the vicinity of the planned ISCO pilot test are appropriate to allow the evaluation of effects of the pilot test.

We appreciate the opportunity to provide you with ongoing environmental consulting and remediation services. Please contact Mr. Mike Arnold at 425-214-0454 or Mr. Erik Ipsen at 503-488-5014 if you have questions regarding this groundwater monitoring report.

Sincerely,

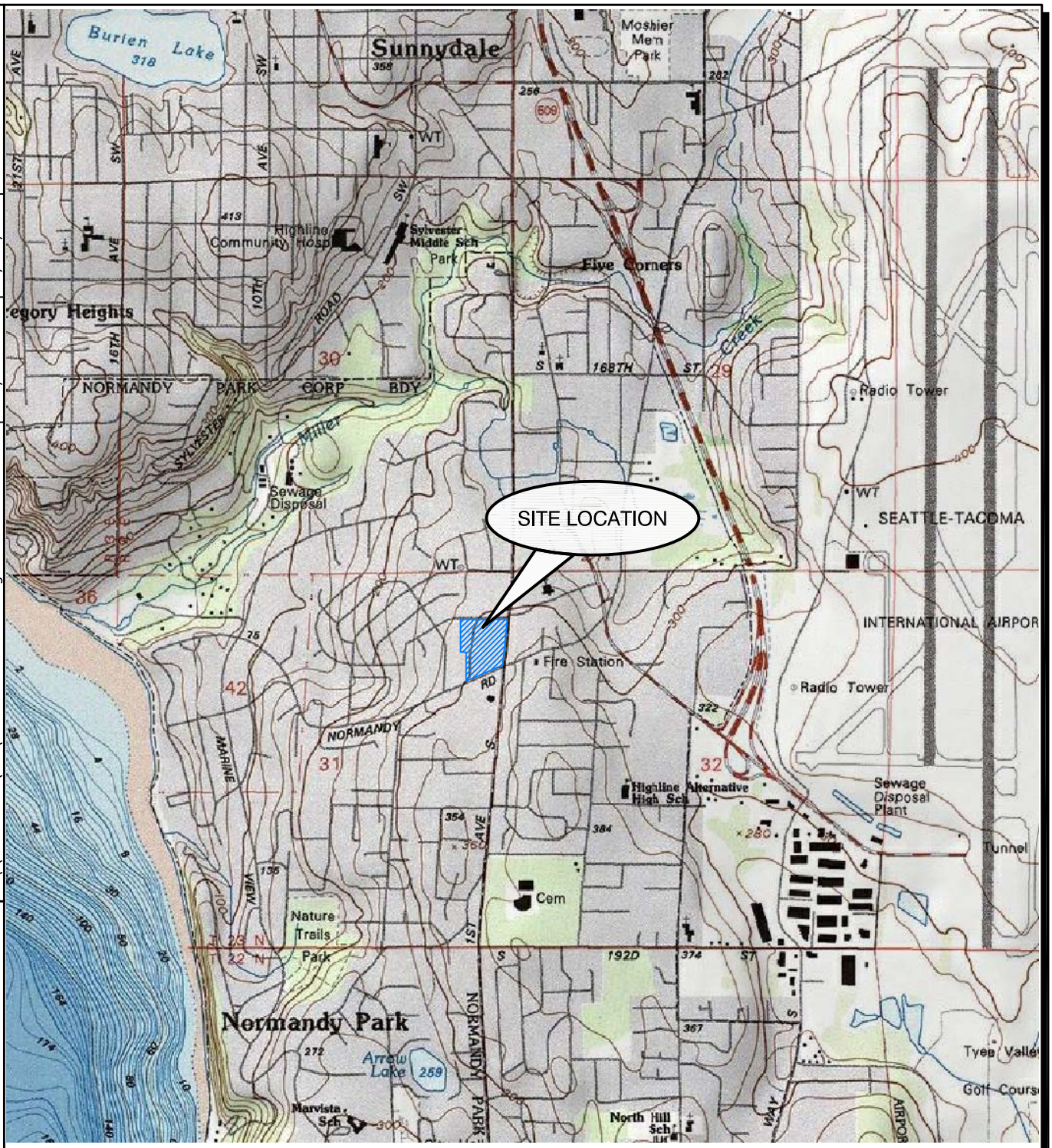
A. Michael Arnold, R.G., R.H.G.
*Senior Project Manager*

Erik C. Ipsen, P.E.
*Partner*

CCG/AMA/ECI/ssh/lld 0123986.05
Attachments

*Figures*

Project No. 0075720.00
Date: 11/17/08
Drawn By: R.O./C.T.
CAD File: F:\0075720\00\007572000-17.dwg




SCALE 1: 24,000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

N

References:
TOPO!® Software
U.S.G.S. 7.5 Minute Series (Topographic) Quadrangle, Des Moines, WA
Version: 1995; Current: 1990

Figure 1
*Site Location Map*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM *11/08*

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| G:\\0123986\01\012398601-03.dwg | R. Olson/CT | 03/03/11 | 0123986.01 |

N

0 50' 100' 200'

1" = 100'

MW-9

SW 176th STREET

RESIDENCES

1st AVE SOUTH

MW-8

SW 177th STREET

MW-7

MW-6

RESIDENCES

DUNN LUMBER

DUNN LUMBER

KMW-6

KMW-7

SW 178th STREET

KMW-8

KMW-3

DC-14

HARRIS PROPERTY

MW-5

DC-8

DC-7

KMW-5D

KMW-5

RESIDENCE

RESIDENCE

DC-15

COMMERCIAL BUILDING

KMW-1

2nd AVE SW

VACANT SHED

DC-17

DC-13

DC-18

SVE-10

DC-16

DC-5

MW-10

DC-12

FORMER SEPTIC TANK

PHONE BOOTH

KMW-4

DC-6

MW-2

MW-1

DC-10B

DC-9A

MW-11

KMW-2

TREATMENT SYSTEM

FORMER LAUNDROMAT/ DRY CLEANER

DC-10A

DC-9B

SVE-5

KMW-9

DC-11

CONDOMINIUMS

VMP-4

VMP-5

VMP-6

SVE-8

SVE-3

SVE-4

DC-3

SVE-9

SIGN

RETAINING WALL

DC-2

SVE-7

DC-4

SVE-6

VMP-3

DC-19

FORMER DAIRY QUEEN

PARKING LOT

SECOND BUILDING (VARIOUS SHOPS)

FOUR STAR DRY CLEANERS

SVE-2

MW-4

DC-1

VMP-2

SVE-1

BUILDING

MANHATTAN VILLAGE SHOPPING CENTER

MW-3

VMP-1

SUSPECTED SEPTIC TANK

QFC BUILDING

LEGEND

- ABANDONED MONITORING WELL
- MONITORING WELL
- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- EXISTING SVE WELL
- EXISTING VAPOR MONITORING WELL
- APPROXIMATE HARRIS PROPERTY BOUNDARY
- APPROXIMATE MANHATTAN VILLAGE SHOPPING CENTER PROPERTY BOUNDARY
- UNDERGROUND ELECTRICAL UTILITY
- UNDERGROUND NATURAL GAS UTILITY
- UNDERGROUND SEWER UTILITY
- UNDERGROUND STORM DRAIN UTILITY
- UNDERGROUND WATER UTILITY

Figure 2

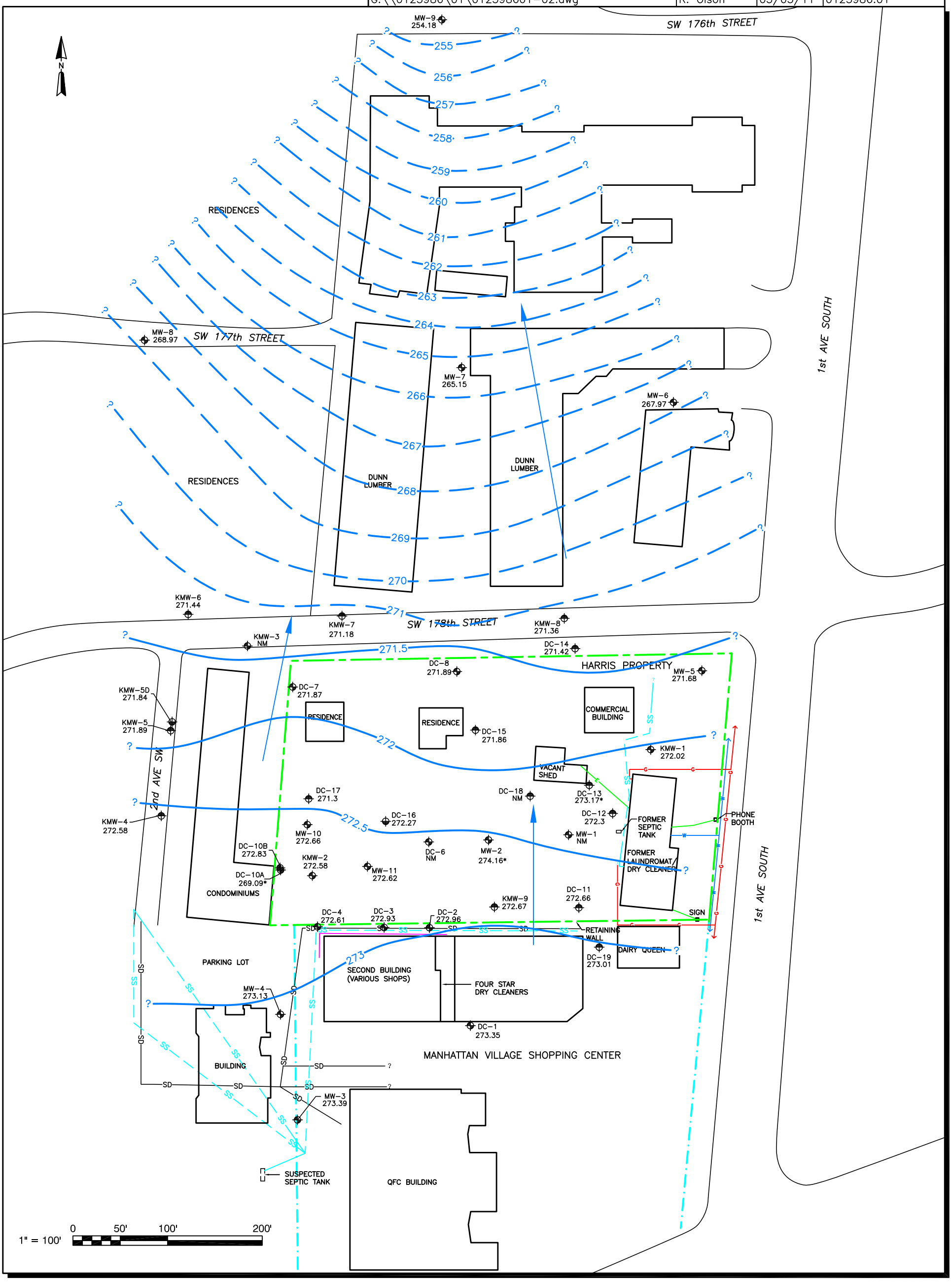
*Site Plan*

*MVSC/Harris Properties*

*Normandy Park, Washington*

ERM 03/11

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| G:\\0123986\01\012398601-02.dwg | R. Olson | 03/03/11 | 0123986.01 |

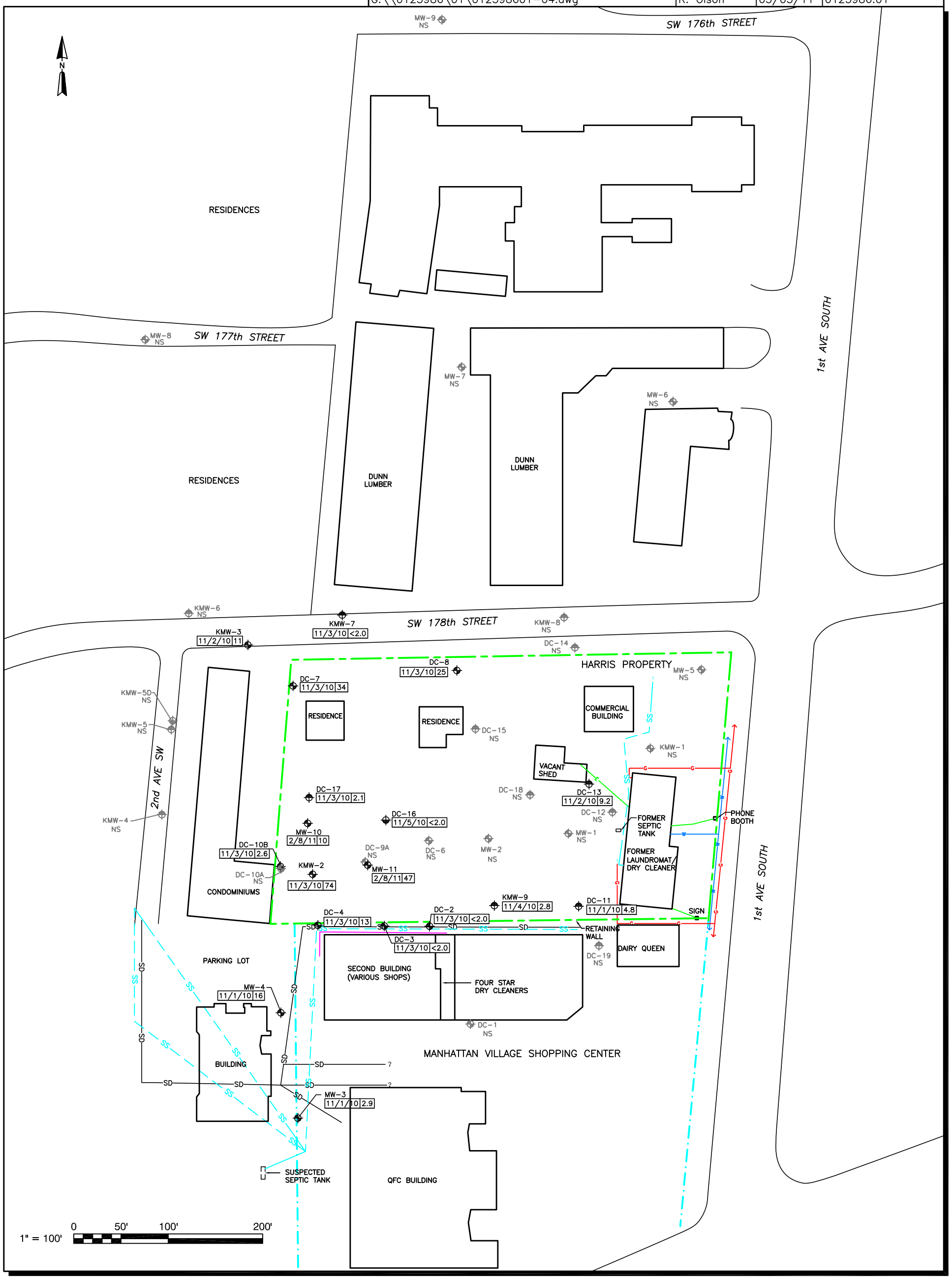



LEGEND

| | |
|---|---|
| ⊕ | Monitoring Well |
| ⊕ | Shallow Monitoring Well |
| ⊕ | Deep Monitoring Well |
| 271.18 | Groundwater Elevation (Feet Above Mean Seal Level) Measured on 11 February 2011 |
| — - 271.00 — | Potentiometric Surface Elevation (Feet Above Mean Sea Level) |
| NM | Not Measured |
| * | Water Level Anomalous, Not Used to Evaluate Groundwater Flow |
| → | Inferred Groundwater Flow Direction |
| | Approximate Harris Property Boundary |
| | Approximate Manhattan Village Shopping Center Property Boundary |
| E | Underground Electrical Utility |
| G | Underground Natural Gas Utility |
| SS | Underground Sewer Utility |
| SD | Underground Storm Drain Utility |
| W | Underground Water Utility |

Figure 3
*Potentiometric Surface Map*
*February 2011*
*MVSC/Harris Properties*
*Normandy Park, Washington*
ERM 03/11

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| G:\\0123986\01\012398601-04.dwg | R. Olson | 03/03/11 | 0123986.01 |




LEGEND

- Monitoring Well
- Shallow Monitoring Well
- Deep Monitoring Well
- 11/3/10|2.1 — Date Sample Collected; Tetrachloroethene (PCE) Concentration (µg/L)
- NS — Not Sampled
- µg/L — Micrograms Per Liter

- Approximate Harris Property Boundary
- Approximate Manhattan Village Shopping Center Property Boundary
- E — Underground Electrical Utility
- G — Underground Natural Gas Utility
- SS — Underground Sewer Utility
- SD — Underground Storm Drain Utility
- W — Underground Water Utility

Figure 4

*PCE Concentrations*
*November 2010 - February 2011*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM 03/11

*Tables*

**Table 2**

*Water Levels - November 2010 and February 2011*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Location | Date | Well Casing Elevation (feet amsl) | Depth to Water (feet below well casing) | Water Level Elevation (feet amsl) |
|---|---|---|---|---|
| MW-1 | 11/5/2010 | NM | NM | - |
| | 2/11/2011 | | NM | - |
| MW-2 | 11/5/2010 | 309.97 | 37.03 | 272.94 |
| | 2/11/2011 | | 35.81 | 274.16 |
| MW-3 | 11/5/2010 | 311.49 | 39.43 | 272.06 |
| | 2/11/2011 | | 38.10 | 273.39 |
| MW-4 | 11/5/2010 | 310.54 | 38.74 | 271.80 |
| | 2/11/2011 | | 37.41 | 273.13 |
| MW-5 | 11/5/2010 | 310.28 | 39.73 | 270.55 |
| | 2/11/2011 | | 38.60 | 271.68 |
| MW-6 | 11/5/2010 | 304.27 | 37.25 | 267.02 |
| | 2/11/2011 | | 36.30 | 267.97 |
| MW-7 | 11/5/2010 | 302.76 | 38.74 | 264.02 |
| | 2/11/2011 | | 37.61 | 265.15 |
| MW-8 | 11/5/2010 | 280.08 | NM | - |
| | 2/11/2011 | | 11.11 | 268.97 |
| MW-9 | 11/5/2010 | 285.11 | 31.98 | 253.13 |
| | 2/11/2011 | | 30.93 | 254.18 |
| MW-10 | 2/11/2011 | 306.70 | 34.04 | 272.66 |
| MW-11 | 2/11/2011 | 307.63 | 35.01 | 272.62 |
| DC-1 | 11/5/2010 | 312.72 | 40.64 | 272.08 |
| | 2/11/2011 | | 39.37 | 273.35 |
| DC-2 | 11/5/2010 | 313.04 | 41.34 | 271.70 |
| | 2/11/2011 | | 40.08 | 272.96 |
| DC-3 | 11/5/2010 | 313.23 | 41.58 | 271.65 |
| | 2/11/2011 | | 40.30 | 272.93 |
| DC-4 | 11/5/2010 | 312.12 | 40.81 | 271.31 |
| | 2/11/2011 | | 39.51 | 272.61 |
| DC-5 | 11/5/2010 | 306.10 | NM | - |
| | 2/11/2011 | | NM | - |
| DC-6 | 11/5/2010 | NM | NM | - |
| | 2/11/2011 | | NM | - |
| DC-7 | 11/5/2010 | 302.78 | 32.15 | 270.63 |
| | 2/11/2011 | | 30.91 | 271.87 |
| DC-8 | 11/5/2010 | 306.38 | 35.69 | 270.69 |
| | 2/11/2011 | | 34.49 | 271.89 |
| DC-9A | 11/5/2010 | 308.02 | NM | - |
| | 2/11/2011 | | NM | - |
| DC-9B | 11/5/2010 | 308.16 | NM[1] | - |
| DC-10A | 11/5/2010 | 304.08 | NM | - |
| | 2/11/2011 | | 34.99 | 269.09 |
| DC-10B | 11/5/2010 | 307.89 | 36.40 | 271.49 |
| | 2/11/2011 | | 35.06 | 272.83 |
| DC-11 | 11/5/2010 | 311.02 | 39.59 | 271.43 |
| | 2/11/2011 | | 38.36 | 272.66 |
| DC-12 | 11/5/2010 | 310.90 | 39.79 | 271.11 |
| | 2/11/2011 | | 38.60 | 272.30 |

**Table 2**

*Water Levels - November 2010 and February 2011*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Location | Date | Well Casing Elevation (feet amsl) | Depth to Water (feet below well casing) | Water Level Elevation (feet amsl) |
|---|---|---|---|---|
| DC-13 | 11/5/2010 | 310.85 | 38.88 | 271.97 |
| | 2/11/2011 | | 37.68 | 273.17 |
| DC-14 | 11/5/2010 | 308.60 | 38.34 | 270.26 |
| | 2/11/2011 | | 37.18 | 271.42 |
| DC-15 | 11/5/2010 | 307.54 | 36.93 | 270.61 |
| | 2/11/2011 | | 35.68 | 271.86 |
| DC-16 | 11/5/2010 | 307.12 | 36.10 | 271.02 |
| | 2/11/2011 | | 34.85 | 272.27 |
| DC-17 | 11/5/2010 | 304.89 | 34.86 | 270.03 |
| | 2/11/2011 | | 33.59 | 271.30 |
| DC-18 | 11/5/2010 | NM | NM | - |
| | 2/11/2011 | | NM | - |
| DC-19 | 11/5/2010 | 313.53 | 41.75 | 271.78 |
| | 2/11/2011 | | 40.52 | 273.01 |
| KMW-1 | 11/5/2010 | 311.21 | 40.37 | 270.84 |
| | 2/11/2011 | | 39.19 | 272.02 |
| KMW-2 | 11/5/2010 | 306.90 | 35.65 | 271.25 |
| | 2/11/2011 | | 34.32 | 272.58 |
| KMW-3 | 11/5/2010 | 296.92 | 26.37 | 270.55 |
| | 2/11/2011 | | NM[2] | - |
| KMW-4 | 11/5/2010 | 299.45 | 28.22 | 271.23 |
| | 2/11/2011 | | 26.87 | 272.58 |
| KMW-5 | 11/5/2010 | 297.10 | 26.49 | 270.61 |
| | 2/11/2011 | | 25.21 | 271.89 |
| KMW-5D | 11/5/2010 | 296.94 | 26.35 | 270.59 |
| | 2/11/2011 | | 25.10 | 271.84 |
| KMW-6 | 11/5/2010 | 294.70 | 24.51 | 270.19 |
| | 2/11/2011 | | 23.26 | 271.44 |
| KMW-7 | 11/5/2010 | 301.32 | 31.36 | 269.96 |
| | 2/11/2011 | | 30.14 | 271.18 |
| KMW-8 | 11/5/2010 | 308.08 | 37.87 | 270.21 |
| | 2/11/2011 | | 36.72 | 271.36 |
| KMW-9 | 11/5/2010 | 310.18 | 38.78 | 271.40 |
| | 2/11/2011 | | 37.51 | 272.67 |

**Notes:**

NM (not measured) = The monitoring well could not be located

NM[1] = The monitoring well was discovered to have been destroyed by tampering.

NM[2] = The monitoring well was obstructed by a parked vehicle.

amsl = Above mean sea level

**TABLE 3**

*Summary of Volatile Organic Compounds in Groundwater (2008-2011)*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well Number | Date Sampled | Volatile Organic Compounds[1] | | | |
|---|---|---|---|---|---|
| | | Chloroform | cis-1,2-Dichloroethene | Tetrachloro-ethene | Trichloro-ethene |
| DC-2 | 4/14/2008 | **1.60** | <0.200 | **0.340** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-3 | 4/14/2008 | **1.50** | <0.200 | **27.8** | <0.200 |
| | 3/9/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-4 | 4/11/2008 | **1.20** | <0.200 | **30.2** | <0.200 |
| | 3/9/2010 | <2.0 | <2.0 | **9.2** | <2.0 |
| | 11/3/2010 | <2.0 | <2.0 | **13** | <2.0 |
| DC-7 | 4/16/2008 | **1.08** | <0.200 | **50.8** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | **34** | <2.0 |
| DC-8 | 4/16/2008 | **0.370** | <0.200 | **39.4** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | **25** | <2.0 |
| DC-10B | 11/3/2010 | <2.0 | <2.0 | **2.6** | <2.0 |
| DC--11 | 3/9/2010 | <2.0 | <2.0 | **4.6** | <2.0 |
| | 11/1/2010 | <2.0 | <2.0 | **4.8** | <2.0 |
| DC-13 | 4/16/2008 | **0.280** | <0.200 | **23.0** | <0.200 |
| | 3/8/2010 | <2.0 | <2.0 | **10** | <2.0 |
| | 11/2/2010 | <2.0 | <2.0 | **9.2** | <2.0 |
| DC-16 | 11/5/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-17 | 4/16/2008 | **0.750** | <0.200 | **74.6** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | **2.1** | <2.0 |
| KMW-2 | 4/16/2008 | **0.640** | <0.200 | **95.8** | **0.230** |
| | 3/8/2010 | <2.0 | <2.0 | **81** | <2.0 |
| | 11/3/2010 | <2.0 | <2.0 | **74** | <2.0 |
| KMW-3 | 11/2/2010 | <2.0 | <2.0 | **11** | <2.0 |
| KMW-7 | 4/15/2008 | **1.33** | <0.200 | **3.88** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| KMW-9 | 3/8/2010 | <2.0 | <2.0 | **4.4** | <2.0 |
| | 11/4/2010 | <2.0 | <2.0 | **2.8** | <2.0 |
| MW-3 | 4/14/2008 | **0.990** | <0.200 | **2.31** | <0.200 |
| | 11/1/2010 | <2.0 | <2.0 | **2.9** | <2.0 |

**TABLE 3**

***Summary of Volatile Organic Compounds in Groundwater (2008-2011)***
***MVSC/Harris Properties***
***Normandy Park, Washington***

| Monitoring Well Number | Date Sampled | Volatile Organic Compounds[1] | | | |
|---|---|---|---|---|---|
| | | Chloroform | cis-1,2-Dichloroethene | Tetrachloro-ethene | Trichloro-ethene |
| MW-4 | 4/14/2008 | **0.780** | **0.320** | **32.6** | **0.490** |
| | 3/9/2010 | <2.0 | <2.0 | **7.8** | <2.0 |
| | 11/1/2010 | <2.0 | <2.0 | **16** | <2.0 |
| MW-10 | 2/8/2011 | <2.0 | <2.0 | **10** | <2.0 |
| MW-11 | 2/8/2011 | <2.0 | <2.0 | **47** | <2.0 |
| | **Cleanup Goal** | 7.17[2] | 80[3] | 5[4] | 5[4] |

**Notes:**

Concentations reported in micrograms per liter (µg/L)

**Bold** entries indicate positive analyte detections.

Shaded cells indicate concentrations greater than the cleanup goal

[1]Volatile organic compounds by USEPA Method 8260

[2]Model Toxics Control Act Method B Groundwater Cleanup Level (Carcinogenic)

[3]Model Toxics Control Act Method B Groundwater Cleanup Level (Noncarcinogenic)

[4]Model Toxics Control Act Method A Groundwater Cleanup Level

**TABLE 4**

*Dissolved Metals in Groundwater*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well Number | Date Sampled | Dissolved Metals (µg/L) | | |
|---|---|---|---|---|
| | | Iron | Manganese | Potassium |
| MW-3 | 11/1/2010 | <220 | <3.6 | **2,000** |
| MW-4 | 11/1/2010 | <220 | <3.6 | **2,300** |
| KMW-2 | 11/3/2010 | <220 | <3.6 | **2,000** |
| KMW-3 | 11/2/2010 | <220 | <3.6 | **1,900** |
| KMW-7 | 11/3/2010 | <220 | <3.6 | **2,100** |
| DC-2 | 11/3/2010 | <220 | <3.6 | **2,000** |
| DC-3 | 11/3/2010 | <220 | <3.6 | **1,700** |
| DC-4 | 11/3/2010 | <220 | <3.6 | **1,800** |
| DC-7 | 11/3/2010 | <220 | <3.6 | **2,200** |
| DC-8 | 11/3/2010 | <220 | <3.6 | **1,400** |
| DC-10B | 11/3/2010 | <220 | <3.6 | **2,100** |
| DC-16 | 11/5/2010 | <220 | <3.6 | **2,000** |
| DC-17 | 11/3/2010 | <220 | <3.6 | **2,100** |

**Notes:**

**Bold** entries indicate positive analyte detections.

µg/L = Micrograms per liter

*Attachment A*
*Gravel Weight Ticket Summary*

# RENTON CONCRETE RECYCLERS

22121 17th Ave. S.E., Suite 117 - Bothell, WA 98021
PIT SITE: 500 MONSTER RD. S.W.
RENTON, WA 98055
(BLACK RIVER QUARRY SITE)

№ 180293

SITE PHONE: (206) 772-2278 BUSINESS OFFICE: (425) 481-9101

Date: 1/31/11

Customer: Kellys Phone:

Address:

Delivery Address: Normandy Park Dozer Estimate

Special Instructions: Made 2 Deaths 2005

Hauler's Name: Same Scaleperson: RM

☐ CASH ☑ CHARGE

| TRUCK # | TIME | MATERIAL | GROSS | TARE | NET | NET T/YDS | PRICE | DRIVER'S SIGNATURE |
|---|---|---|---|---|---|---|---|---|
| | 743 | 1 1/4 | 56120 | 25800 | 31120 | 1556 | | |
| | 839 | 1 1/4 | 58620 | " | 32820 | 1641 | | |
| | 859 | 1 1/4 | 57620 | " | 31820 | 1591 | | |
| | 1021 | 1 1/4 | 55800 | " | 32800 | 1640 | | |
| | 1105 | 1 1/4 | 56100 | " | 30520 | 1526 | | |
| | 1205 | 1 1/4 | 57040 | " | 31240 | 1562 | | |
| | 1247 | 1 1/4 | 54040 | " | 29240 | 1462 | | |
| | 1313 | 1 1/4 | 58060 | " | 31260 | 1563 | | |
| | 215 | 1 1/4 | 55600 | " | 29800 | 1490 | | |
| | 307 | 1 1/4 | 56100 | " | 30300 | 1515 | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | 155.36 | | |

Subtotal

Tax

Total

DRIVER'S SIGNATURE:

NOTICE: It is specifically agreed that this company shall not be in anyway responsible for damage to customer's proper
resulting in deliveries beyond curb line.

TERMS: NET 15 DAYS from the end of the month. A finance charge will be assessed on all past due accounts
rate of 1 1/2% per month. Annual finance charge of 18%.

*Attachment B*
*Drilling Logs*

**ERM**
1218 3rd Avenue, Suite 1412
Seattle, Washington 98101
Phone: (425) 462-8591
www.erm.com

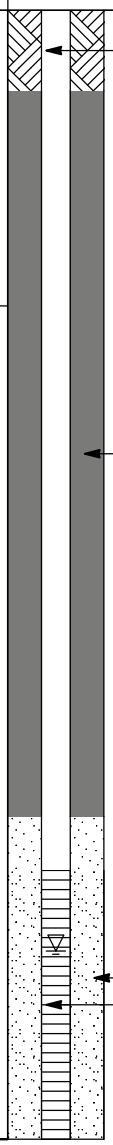
# LOG OF MONITORING WELL: MW-10

Project Number: 0123986
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: Matt Crandell

Date Started: 2/3/2011
Date Completed: 2/3/2011
Total Depth: 42 feet
Borehole Diameter: 6.25"
Ground Surface Elevation: 303.21'
Initial Water Level: 35 feet bgs
Notes: Vacuum Cleared to 5' bgs.

| Depth (ft) | Sample Interval | PID (ppm) | Blow Counts | USCS Code | GRAPHIC LOG | Soil Descriptions and Observations |
|---|---|---|---|---|---|---|
| 0 | | | | SM | | Brown fine SAND with silt, moist, loose. |
| 5 | X | | 3 3 4 | SM | | Trace silt. |
| 10 | X | | 3 6 10 | SM | | Silt, brown. |
| 15 | X | | 5 6 7 | SP | | Fine to medium SAND, trace gravel, light gray, loose. |
| 20 | X | | 6 7 7 | SP | | Light brown, compacted fine sandy silt. |
| 25 | X | | 9 9 6 | SP | | Trace gravel grading to clasts over 1". Grades to fine sand. |
| 30 | X | | 10 13 15 | SP | | |
| 35 | X | | 10 15 16 | SP | | |
| 40 | X | | 15 50 6 | SP | | |
| | | | | | | Total Depth - 42 feet bgs |
| 45 | | | | | | |

WELL DIAGRAM




MW TO 50FT WHITTAKER - - 2/15/11 12:59 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY_OLW.GPJ

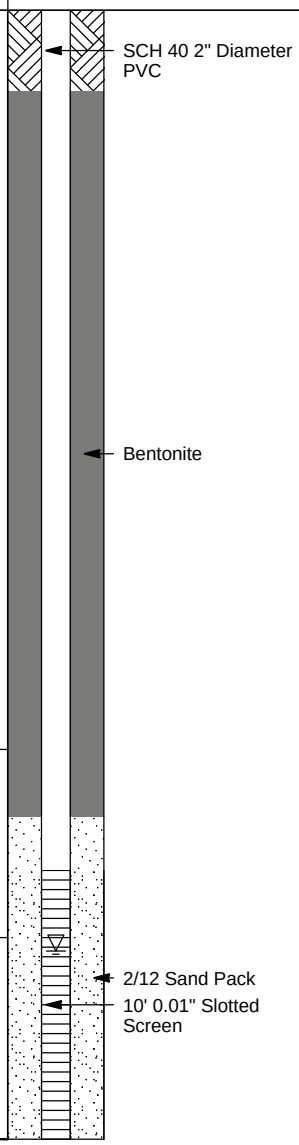
**ERM**
1218 3rd Avenue, Suite 1412
Seattle, Washington 98101
Phone: (425) 462-8591
www.erm.com

# LOG OF MONITORING WELL: MW-11

Project Number: 0123986
Project Name: Normandy Park
Client Name: Normandy Park
Location: Normandy Park, Washington
Contractor: Cascade Drilling
Drilling Method: Hollow Stem Auger
Logged By: Matt Crandell

Date Started: 2/3/2011
Date Completed: 2/3/2011
Total Depth: 42 feet
Borehole Diameter: 6.25"
Ground Surface Elevation: 304.24'
Initial Water Level: 35 feet bgs
Notes: Vacuum Cleared to 5' bgs.

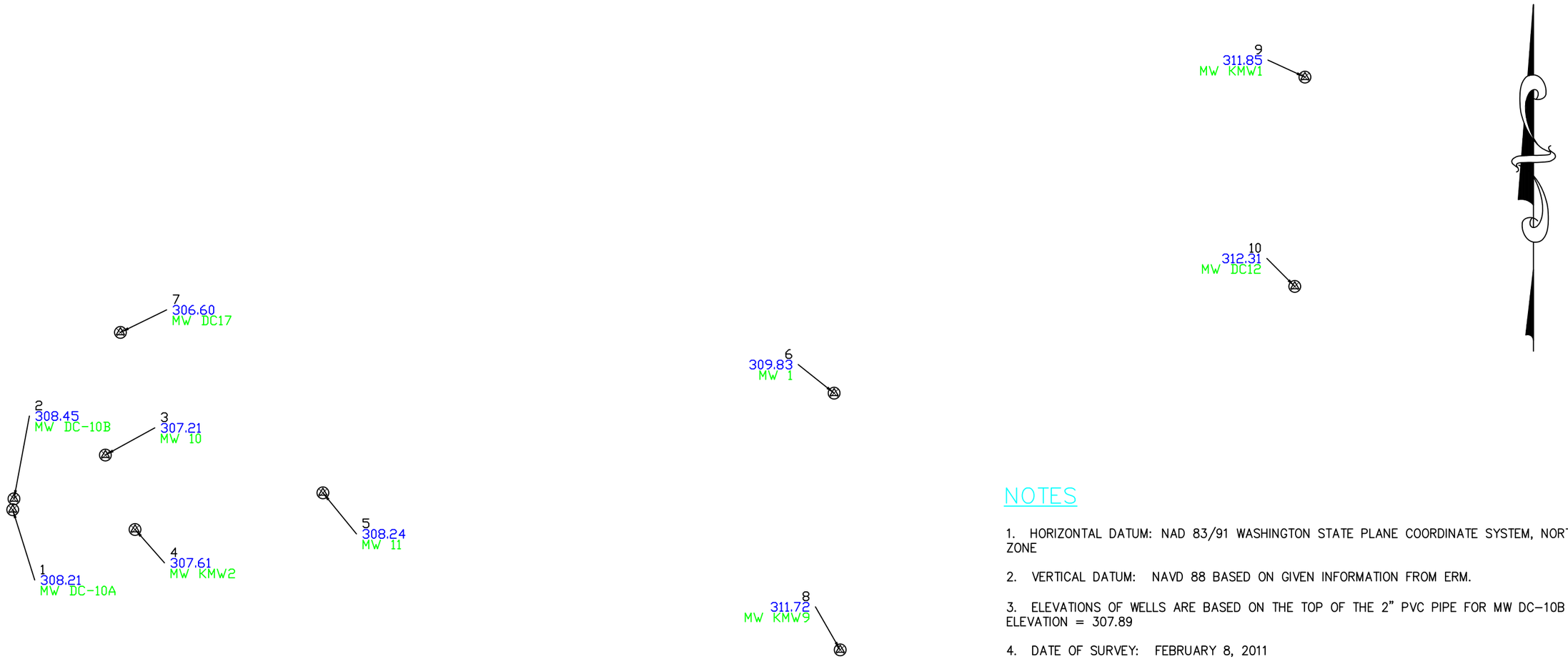
| Depth (ft) | Sample Interval | PID (ppm) | Blow Counts | USCS Code | Soil Descriptions and Observations |
|---|---|---|---|---|---|
| 0 | | | | SM | Medium brown fine SAND with silt, moist, loose. |
| 5 | | | 5 6 6 | | Trace organic matter with 24" silt layer. Sand changes to light brown/gray. |
| 10 | | | 5 5 6 | | Medium gray. |
| 15 | | | 5 5 5 | | Fine to medium sand, trace silt. |
| 20 | | | 10 11 12 | | Trace fine gravel in ~6" layer. |
| 25 | | | 7 10 11 | | Silty fine brown sand. |
| 30 | | | 50 6 | SP | Gravelly, medium to coarse SAND. Gravel is small, medium, semi-rounded. |
| 35 | | | 22 50 6 | SM | Medium to coarse gray SAND, trace silt. |
| 40 | | | 22 36 50 6 | | Wet. |
| 45 | | | | | Total Depth - 42 feet bgs |




MW TO 50FT WHITTAKER - - 2/15/11 12:59 - C:\PROGRAM FILES\GINT\PROJECTS\NORMANDY_OLW.GPJ

*Attachment C*
*Survey Report*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MVSC/Harris Properties** | | | | | | | | | | | |
| **DATE OF SURVEY: February 8, 2011** | | | | | | | | | | | |
| | | | | | | note 1 | | note 2 | | | |
| | | | Top of metal casing (GPS Elev) | Top of PVC by levels based on GPS Elev of MW 10 | Top of Metal Case (By Levels) | Top of PVC Casing (By Levels Held Elev of DC-10B) | | Top of PVC | | Top of Metal Case Normandy Park Elevation | Top of PVC Normandy Park Elevation |
| Pt.# | Northing | Easting | | | Elevation | Elevation | | | Description | Elevation | Elevation |
| 3 | 165132.1* | 1268522.3* | 307.47 | 306.96 | 307.21* | 306.70* | | | MW 10* | | |
| 5 | 165121.6* | 1268582.6* | 308.52 | 307.89 | 308.24* | 307.63* | | | MW 11* | | |
| | | | | | | | | | | | |
| 1 | 165116.9 | 1268496.7 | 308.14 | 307.98 | | 307.72 | | 304.80 | MW DC-10A | | |
| 2 | 165120.0 | 1268497.0 | 308.54 | 308.15 | | 307.89 | | 304.15/307.66 | MW DC-10B | | |
| 4 | 165111.5 | 1268530.6 | 307.54 | 307.31 | | 307.05 | | 306.90 | MW KMW2 | | |
| 6 | 165149.2 | 1268724.2 | 309.27 | | | | | | MW 1 | | |
| 7 | 165166.0 | 1268526.5 | 306.69 | 306.30 | | 306.04 | | 304.89 | MW DC17 | | |
| 8 | 165078.1 | 1268725.9 | 311.16 | | | | | | MW KMW9 | | |
| 9 | 165236.7 | 1268854.6 | 311.29 | | | | | | MW KMW1 | | |
| 10 | 165178.8 | 1268851.8 | 311.75 | | | | | | MW DC12 | | |
| | | | | | | | | | | | |
| | Note 1: based on Compiled Survey Data Summary table received via email dated 2-4-2011 | | | | | | | | | | |
| | Note 2: based on Compiled Survey Data Summary table received via email dated 2-14-2011 | | | | | | | | | | |
| Note: | Site Elevations are based on the the top of PVC casing for MW DC-10B. Elevation = 307.89 | | | | | | | | | | |
| | Site Coordinates NAD 83/91 established by RTK GPS Single observation | | | | | | | | | | |
| | Elevations for the metal casing are based on RTK readings to the center of the lid with the exception of MW10 and MW11. Differential levels were ran to the rim of MW10 and MW 11. | | | | | | | | | | |
| | Elevation on the PVC inner pipe is on the black mark and were established be differential levels. | | | | | | | | | | |
| | Where no elevations are shown, no readings were taken. | | | | | | | | | | |
| | Scope of work was to locate MW10 and MW 11. Other information is for reference only. | | | | | | | | | | |
| | * New wells surveyed. All other wells previously surveyed by others. | | | | | | | | | | |
| | Conversion from NAVD83/91 to Normandy Park Elevations are based on table provided by ERM. | | | | | | | | | | |




## NOTES

1. HORIZONTAL DATUM: NAD 83/91 WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE

2. VERTICAL DATUM: NAVD 88 BASED ON GIVEN INFORMATION FROM ERM.

3. ELEVATIONS OF WELLS ARE BASED ON THE TOP OF THE 2" PVC PIPE FOR MW DC-10B ELEVATION = 307.89

4. DATE OF SURVEY: FEBRUARY 8, 2011

5. EQUIPMENT USED: LEICA 1200 GPS, LEICA DNA10 ELECTRONIC LEVEL.

## LEGEND

⊙ MONITORING WELL

SURVEYED: TI/FM
DRAWN: TI
CHECKED: TI

| REV | REVISION | DATE | BY | APP'D |
|---|---|---|---|---|

True NORTH LAND SURVEYING, INC.
815 S. Weller Street
Suite 200
Seattle, WA 98104-3023
206.332.0800

Date: 2-10-2011
Scale: 1" = 30'
Book: J1108.DWG

# MVSC/Harris Properties
## Monitoring Well Survey
For ERM

Job Number: J1108
Sheet: 1 of 1

*Attachment D*
*Laboratory Analytical Data, Chain of Custody Documents, and Laboratory Quality Assurance/Quality Control Report*

**TABLE 2**

*Volatile Organic Compounds in Groundwater From Wells (2008-2010)*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well Number | Date Sampled | Volatile Organic Compounds[1] (µg/L) | | | | |
|---|---|---|---|---|---|---|
| | | Bromodichloro-methane | Chloroform | cis-1,2-Dichloroethene | Tetrachloro-ethene | Trichloro-ethene |
| MW-3 | 4/14/2008 | <0.200 | **0.990** | <0.200 | **2.31** | <0.200 |
| | 11/1/2010 | <2.0 | <2.0 | <2.0 | **2.9** | <2.0 |
| MW-4 | 4/14/2008 | <0.200 | **0.780** | **0.320** | **32.6** | **0.490** |
| | 3/9/2010 | <2.0 | <2.0 | <2.0 | **7.8** | <2.0 |
| | 11/1/2010 | <2.0 | <2.0 | <2.0 | **16** | <2.0 |
| MW-5 | 4/11/2008 | <0.200 | <0.200 | <0.200 | **0.470** | <0.200 |
| MW-6 | 4/15/2008 | <0.200 | <0.200 | <0.200 | **1.99** | <0.200 |
| MW-7 | 4/16/2008 | <0.200 | **1.12** | <0.200 | **22.4** | <0.200 |
| MW-8 | 8/21/2008 | <0.1 | **0.3 J** | <0.1 | **0.2 J** | <0.1 |
| MW-9 | 8/21/2008 | <0.1 | **0.4 J** | <0.1 | **0.1 J** | <0.1 |
| KMW-1 | 4/14/2008 | <0.200 | **0.450** | <0.200 | <0.200 | <0.200 |
| KMW-2 | 4/16/2008 | <0.200 | **0.640** | <0.200 | **95.8** | **0.230** |
| | 3/8/2010 | <2.0 | <2.0 | <2.0 | **81** | <2.0 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | **74** | <2.0 |
| KMW-3 | 11/2/2010 | <2.0 | <2.0 | <2.0 | **11** | <2.0 |
| KMW-7 | 4/15/2008 | <0.200 | **1.33** | <0.200 | **3.88** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| KMW-8 | 4/15/2008 | **0.310** | **1.13** | <0.200 | **17.4** | <0.200 |
| KMW-9 | 3/8/2010 | <2.0 | <2.0 | <2.0 | **4.4** | <2.0 |
| | 11/4/2010 | <2.0 | <2.0 | <2.0 | **2.8** | <2.0 |
| DC-2 | 4/14/2008 | <0.200 | **1.60** | <0.200 | **0.340** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-3 | 4/14/2008 | <0.200 | **1.50** | <0.200 | **27.8** | <0.200 |
| | 3/9/2010 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-4 | 4/11/2008 | <0.200 | **1.20** | <0.200 | **30.2** | <0.200 |
| | 3/9/2010 | <2.0 | <2.0 | <2.0 | **9.2** | <2.0 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | **13** | <2.0 |
| DC-7 | 4/16/2008 | <0.200 | **1.08** | <0.200 | **50.8** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | **34** | <2.0 |
| DC-8 | 4/16/2008 | <0.200 | **0.370** | <0.200 | **39.4** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | **25** | <2.0 |
| DC-9B | 4/15/2008 | <0.200 | **1.27** | <0.200 | **0.640** | <0.200 |
| DC-10B | 11/3/2010 | <2.0 | <2.0 | <2.0 | **2.6** | <2.0 |
| DC--11 | 3/9/2010 | <2.0 | <2.0 | <2.0 | **4.6** | <2.0 |
| | 11/1/2010 | <2.0 | <2.0 | <2.0 | **4.8** | <2.0 |
| DC-13 | 4/16/2008 | <0.200 | **0.280** | <0.200 | **23.0** | <0.200 |
| | 3/8/2010 | <2.0 | <2.0 | <2.0 | **10** | <2.0 |
| | 11/2/2010 | <2.0 | <2.0 | <2.0 | **9.2** | <2.0 |
| DC-16 | 11/5/2010 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-17 | 4/16/2008 | <0.200 | **0.750** | <0.200 | **74.6** | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | **2.1** | <2.0 |
| DC-19 | 4/14/2008 | <0.200 | <0.200 | <0.200 | **0.660** | <0.200 |
| Cleanup Goal | | 0.71[2] | 7.17[2] | 80[3] | 5[4] | 5[4] |

**Notes:**

**Bold** entries indicate positive analyte detections.

Shaded cells indicate concentrations greater than the cleanup goal

[1]Halogenated volatile organic compounds by USEPA Method 8260

[2]Model Toxics Control Act Method B Groundwater Cleanup Level (Carcinogenic)

[3]Model Toxics Control Act Method B Groundwater Cleanup Level (Noncarcinogenic)

[4]Model Toxics Control Act Method A Groundwater Cleanup Level

µg/L = Micrograms per liter

J = Concentration reported as "estimated" by lab

1011034

**Environmental Resources Management**

# CHAIN OF CUSTODY RECORD

**NO:** 4064

915-118th Avenue S.E. Suite 130 ● Bellevue, WA 98005 ● (425) 462-8591 ● FAX (425) 455-3573

Page 1 of 2

| PROJECT # | PROJECT NAME |
|---|---|
| 114726 | Normandy Park Baseline GW Sampling |

| SAMPLER: (PRINT NAME) | (SIGNATURE) |
|---|---|
| Matt Crandell | |

RECEIVING LABORATORY: ALS

| SAMPLE I.D. | DATE | TIME | COMP | GRAB | SAMPLING METHOD | PRESERVATIVE | ICE (Y/N) | SAMPLING VOLUME | # OF CONTAINERS | MATRIX: SOIL | MATRIX: WATER | MATRIX: GAS | REQUESTED PARAMETERS: Chlorinated VOCs 8260 | REQUESTED PARAMETERS: Dissolved iron, manganese & potassium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 MW-4-110110 | 11/1/10 | 1106 | | | Bladder | | Y | 660 mL | 4 | | X | | X | X |
| 2 MW-3-110110 | 11/1/10 | 1346 | | | pump | | Y | 660mL | 4 | | X | | X | X |
| 3 DC-11-110110 | 11/1/10 | 1535 | | | | | Y | 160 mL | 3 | | X | | X | |
| 4 KMW-3-110210 | 11/2/10 | 1713 | | | | | Y | 660mL | 4 | | X | | X | X |
| 5 DC-13-110210 | 11/2/10 | 1605 | | | | | Y | 160mL | 3 | | X | | X | |
| 6 DC-2-110310 | 11/3/10 | 0918 | | | | | Y | 660mL | 4 | | X | | X | X |
| 7 DC-3-110310 | 11/3/10 | 0829 | | | | | Y | 660 mL | 4 | | X | | X | X |
| 8 DC-4-110310 | 11/3/10 | 0728 | | | | | Y | 660 mL | 4 | | X | | X | X |
| 9 KMW-7-110310 | 11/3/10 | 1012 | | | | | Y | 660 mL | 4 | | X | | X | X |
| 10 DC-7-110310 | 11/3/10 | 1050 | | | | | Y | 660mL | 4 | | X | | X | X |

| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY | DATE | TIME |
|---|---|---|---|---|---|
| | 11/4/10 | | ALS | 11/4/10 | 1:10 |
| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY | DATE | TIME |
| | | | | | |
| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY | DATE | TIME |
| | | | | | |

FIELD REMARKS:

REMARKS ON SAMPLE RECEIPT

- ☐ BOTTLE INTACT
- ☐ CUSTODY SEALS
- ☐ CHILLED
- ☐ PRESERVED
- ☐ SEALS INTACT
- ☐ SEE REMARKS

ERM REMARKS:

SEND REPORT TO:

WHITE - LABORATORY COPY  CANARY - FIELD COPY  PINK - DATABASE MANAGER  GOLD - PROJECT FILE

1011034

**Environmental Resources Management**

# CHAIN OF CUSTODY RECORD

NO: 4065

915-118th Avenue S.E. Suite 130 ● Bellevue, WA 98005 ● (425) 462-8591 ● FAX (425) 455-3573

Page 2 of 2

| PROJECT # | PROJECT NAME |
|---|---|
| 114726 | Normandy Park Baseline GW sampling |
| **SAMPLER: (PRINT NAME)** | **(SIGNATURE)** |
| Matt Crandell | |

RECEIVING LABORATORY

ALS

| | SAMPLE I.D. | DATE | TIME | COMP | GRAB | SAMPLING METHOD | PRESERVATIVE | ICE (Y/N) | SAMPLING VOLUME | # OF CONTAINERS | MATRIX: SOIL | MATRIX: WATER | MATRIX: GAS | REQUESTED PARAMETERS: Chlorinated VOC's 8260 | REQUESTED PARAMETERS: Dissolved iron, manganese & potassium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | DC-8-110310 | 11/3/10 | 1200 | | | bladder | | Y | 660mL | 4 | | X | | X | X |
| 12 | KMW-2-110310 | 11/3/10 | 1315 | | | pump | | Y | 660mL | 4 | | X | | X | X |
| 13 | DC-10B-110310 | 11/3/10 | 1511 | | | " | | Y | 660mL | 4 | | X | | X | X |
| 14 | DC-17-110310 | 11/3/10 | 1648 | | | " | | Y | 660mL | 4 | | X | | X | X |
| 15 | KMW-9-110410 | 11/4/10 | 0944 | | | " | | Y | 160mL | 3 | | X | | X | |

| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY | DATE | TIME |
|---|---|---|---|---|---|
| Matt Crandell | 11/4/10 | | ALS | 11/4/10 | 1:10 |
| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY | DATE | TIME |
| | | | | | |
| RELINQUISHED BY (SIGNATURE) | DATE | TIME | RECEIVED BY | DATE | TIME |
| | | | | | |

FIELD REMARKS

REMARKS ON SAMPLE RECEIPT

☐ BOTTLE INTACT ☐ CUSTODY SEALS ☐ CHILLED
☐ PRESERVED ☐ SEALS INTACT ☐ SEE REMARKS

ERM REMARKS

SEND REPORT TO:

WHITE - LABORATORY COPY CANARY - FIELD COPY PINK - DATABASE MANAGER GOLD - PROJECT FILE

ALS Environmental

## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-01 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/1/2010 11:06 |
| CLIENT SAMPLE ID | MW-4-110110 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **16** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

Environmental www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-01 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/1/2010 11:06 |
| CLIENT SAMPLE ID | MW-4-110110 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2300** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **107** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **93.4** | 11/08/2010 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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ALS Environmental

## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-02 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/1/2010 13:46 |
| CLIENT SAMPLE ID | MW-3-110110 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **2.9** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-02 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/1/2010 13:46 |
| CLIENT SAMPLE ID | MW-3-110110 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2000** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **108** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **93.6** | 11/08/2010 | GAP |

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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-03 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/1/2010 15:35 |
| CLIENT SAMPLE ID | DC-11-110110 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **4.8** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-03 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/1/2010 15:35 |
| CLIENT SAMPLE ID | DC-11-110110 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **109** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **92.9** | 11/08/2010 | GAP |

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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-04 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/2/2010 17:13 |
| CLIENT SAMPLE ID | KMW-3-110210 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **11** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-04 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/2/2010 17:13 |
| CLIENT SAMPLE ID | KMW-3-110210 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **1900** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **108** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **92.8** | 11/08/2010 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-05 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/2/2010 16:05 |
| CLIENT SAMPLE ID | DC-13-110210 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **9.2** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-05 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/2/2010 16:05 |
| CLIENT SAMPLE ID | DC-13-110210 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **110** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **91.5** | 11/08/2010 | GAP |

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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-06 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 09:18 |
| CLIENT SAMPLE ID | DC-2-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-06 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 09:18 |
| CLIENT SAMPLE ID | DC-2-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2000** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **110** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **92.2** | 11/08/2010 | GAP |

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| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 08:29 |
| CLIENT SAMPLE ID | DC-3-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-07 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 08:29 |
| CLIENT SAMPLE ID | DC-3-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **1700** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **110** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **93.7** | 11/08/2010 | GAP |

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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-08 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 07:28 |
| CLIENT SAMPLE ID | DC-4-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **13** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-08 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 07:28 |
| CLIENT SAMPLE ID | DC-4-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **1800** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **111** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **93.2** | 11/08/2010 | GAP |

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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-09 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 10:12 |
| CLIENT SAMPLE ID | KMW-7-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-09 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 10:12 |
| CLIENT SAMPLE ID | KMW-7-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2100** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **111** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **92.9** | 11/08/2010 | GAP |

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| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/2/2010 10:50 |
| CLIENT SAMPLE ID | DC-7-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **34** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-10 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/2/2010 10:50 |
| CLIENT SAMPLE ID | DC-7-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2200** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **110** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **92.2** | 11/08/2010 | GAP |

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| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 12:00 |
| CLIENT SAMPLE ID | DC-8-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **25** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-11 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 12:00 |
| CLIENT SAMPLE ID | DC-8-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **1400** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **110** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **93.2** | 11/08/2010 | GAP |

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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-12 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 13:15 |
| CLIENT SAMPLE ID | KMW-2-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **74** | 8.0 | 4 | UG/L | 11/10/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-12 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 13:15 |
| CLIENT SAMPLE ID | KMW-2-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2000** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **111** | 11/08/2010 | GAP |
| 1,2-Dichloroethane-d4 4X Dilution | EPA-8260 | **106** | 11/10/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **94.5** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene 4X Dilution | EPA-8260 | **91.0** | 11/10/2010 | GAP |

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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-13 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 15:11 |
| CLIENT SAMPLE ID | DC-10B-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **2.6** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-13 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 15:11 |
| CLIENT SAMPLE ID | DC-10B-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2100** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **111** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **92.7** | 11/08/2010 | GAP |

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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-14 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 16:48 |
| CLIENT SAMPLE ID | DC-17-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **2.1** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-14 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 16:48 |
| CLIENT SAMPLE ID | DC-17-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2100** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **111** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **93.8** | 11/08/2010 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-15 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | |
| CLIENT SAMPLE ID | KMW-9-11/04 09:44 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **2.8** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-15 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | |
| CLIENT SAMPLE ID | KMW-9-11/04 09:44 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **110** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **94.4** | 11/08/2010 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE: | 11/10/2010 |
| | | ALS JOB#: | 1011034 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Mendes | | |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | | |

## LABORATORY BLANK RESULTS

**MB-110510W**

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/05/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/05/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE: | 11/10/2010 |
| | | ALS JOB#: | 1011034 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Mendes | | |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | | |

## LABORATORY BLANK RESULTS

**MB-110510W**

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |

**MB-110510W**

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | U | 20 | 1 | UG/L | 11/09/2010 | RAL |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE: | 11/10/2010 |
| | | ALS JOB#: | 1011034 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Mendes | | |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | | |

## LABORATORY CONTROL SAMPLE RESULTS

### ALS Test Batch ID: 1220 - Water by EPA-8260

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| 1,1-Dichloroethene - BS | EPA-8260 | **113** | | | 11/05/2010 | GAP |
| 1,1-Dichloroethene - BSD | EPA-8260 | **110** | **3** | | 11/05/2010 | GAP |
| Trichloroethene - BS | EPA-8260 | **114** | | | 11/05/2010 | GAP |
| Trichloroethene - BSD | EPA-8260 | **114** | **0** | | 11/05/2010 | GAP |
| Toluene - BS | EPA-8260 | **115** | | | 11/05/2010 | GAP |
| Toluene - BSD | EPA-8260 | **115** | **0** | | 11/05/2010 | GAP |
| Chlorobenzene - BS | EPA-8260 | **118** | | | 11/05/2010 | GAP |
| Chlorobenzene - BSD | EPA-8260 | **118** | **0** | | 11/05/2010 | GAP |

### ALS Test Batch ID: 1222 - Water by EPA-6020

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| Iron - BS | EPA-6020 | **99.2** | | | 11/09/2010 | RAL |
| Iron - BSD | EPA-6020 | **99.8** | **0** | | 11/09/2010 | RAL |
| Manganese - BS | EPA-6020 | **95.8** | | | 11/09/2010 | RAL |
| Manganese - BSD | EPA-6020 | **97.2** | **1** | | 11/09/2010 | RAL |
| Potassium - BS | EPA-6020 | **91.0** | | | 11/09/2010 | RAL |
| Potassium - BSD | EPA-6020 | **93.9** | **3** | | 11/09/2010 | RAL |

APPROVED BY:

Laboratory Director



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8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
(206) 292-9059 Seattle
(425) 356-2626 Fax
http://www.alsenviro.com

# Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): 1011043

Date 11/5/10 Page 1 Of 1

PROJECT ID: Normandy Park Baseline GW Sampling
REPORT TO COMPANY: ERM
PROJECT MANAGER: Mike Arnold
ADDRESS: 915 118th Ave SE Suite 130
Bellevue WA 98005
PHONE: 425.462.8591 FAX:
P.O. NUMBER: 114726 E-MAIL: mike.arnold@erm.com
INVOICE TO COMPANY:
ATTENTION: ERM Walnut Creek
ADDRESS:

ANALYSIS REQUESTED

OTHER (Specify)

| SAMPLE I.D. | DATE | TIME | TYPE | LAB# | NWTPH-HCID | NWTPH-DX | NWTPH-GX | BTEX by EPA-8021 | MTBE by EPA-8021 ☐ EPA-8260 ☐ | Halogenated Volatiles by EPA 8260 | Volatile Organic Compounds by EPA 8260 | EDB / EDC by EPA 8260 SIM (water) | EDB / EDC by EPA 8260 (soil) | Semivolatile Organic Compounds by EPA 8270 | Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐ | PCB ☐ Pesticides ☐ by EPA 8081/8082 | Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐ | Metals Other (Specify) | TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐ | Dissolved iron, manganese, potassium | NUMBER OF CONTAINERS | RECEIVED IN GOOD CONDITION? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. DC-16-110510 | 11/5/10 | 1500 | W | 1 | | | | | | | X | | | | | | | | X | | |
| 2. | | | | | | | | | | | | | | | | | | | | | |
| 3. | | | | | | | | | | | | | | | | | | | | | |
| 4. | | | | | | | | | | | | | | | | | | | | | |
| 5. | | | | | | | | | | | | | | | | | | | | | |
| 6. | | | | | | | | | | | | | | | | | | | | | |
| 7. | | | | | | | | | | | | | | | | | | | | | |
| 8. | | | | | | | | | | | | | | | | | | | | | |
| 9. | | | | | | | | | | | | | | | | | | | | | |
| 10. | | | | | | | | | | | | | | | | | | | | | |

MC

MC

LABORATORY COPY

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Matt C, ERM, 11/8/10, 10:00
   Received By: ACS 11/8/10 1340
2. Relinquished By:
   Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 (Standard) | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: 5 (Standard) | 3 | 1 | SAME DAY

OTHER: Specify:

* Turnaround request less than standard may incur Rush Charges

ALS Environmental

## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/17/2010<br>1011043<br>-01 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 11/8/2010 |
| CLIENT PROJECT: | Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/5/2010 15:00 |
| CLIENT SAMPLE ID | DC-16-110510 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/10/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 11/10/2010 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/10/2010 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 11/10/2010 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 11/10/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 11/10/2010 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 11/10/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/10/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/17/2010<br>1011043<br>-01 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 11/8/2010 |
| CLIENT PROJECT: | Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/5/2010 15:00 |
| CLIENT SAMPLE ID | DC-16-110510 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 11/10/2010 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Iron | EPA-6020 (Dissolved) | U | 220 | 1 | UG/L | 11/16/2010 | RAL |
| Manganese | EPA-6020 (Dissolved) | U | 3.6 | 1 | UG/L | 11/16/2010 | RAL |
| Potassium | EPA-6020 (Dissolved) | **2000** | 20 | 1 | UG/L | 11/16/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **107** | 11/10/2010 | GAP |
| Toluene-d8 | EPA-8260 | **96.4** | 11/10/2010 | GAP |



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|---|---|---|---|
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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 11/8/2010 |
| CLIENT PROJECT: | Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/5/2010 15:00 |
| CLIENT SAMPLE ID | DC-16-110510 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 4-Bromofluorobenzene | EPA-8260 | **91.2** | 11/10/2010 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE: | 11/17/2010 |
| | | ALS JOB#: | 1011043 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Arnold | | |
| CLIENT PROJECT: | Normandy Park Baseline GW Sampling | | |

## LABORATORY BLANK RESULTS

**MB-110510W**

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/05/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 11/05/2010 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/05/2010 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 11/05/2010 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 11/05/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 11/05/2010 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 11/05/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/05/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

CLIENT: ERM West
915 118th Ave. SE, Suite 130
Bellevue, WA 98005

DATE: 11/17/2010
ALS JOB#: 1011043
WDOE ACCREDITATION: C601

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT: Normandy Park Baseline GW Sampling

## LABORATORY BLANK RESULTS

### MB-110510W

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 11/05/2010 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |

### MB-111510W

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Iron | EPA-6020 (Dissolved) | U | 220 | 1 | UG/L | 11/16/2010 | RAL |
| Manganese | EPA-6020 (Dissolved) | U | 3.6 | 1 | UG/L | 11/16/2010 | RAL |
| Potassium | EPA-6020 (Dissolved) | U | 20 | 1 | UG/L | 11/16/2010 | RAL |



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## CERTIFICATE OF ANALYSIS

| | | | |
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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE: | 11/17/2010 |
| | | ALS JOB#: | 1011043 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Arnold | | |
| CLIENT PROJECT: | Normandy Park Baseline GW Sampling | | |

## LABORATORY BLANK RESULTS

**MB-111510W**

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|



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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE: | 11/17/2010 |
| | | ALS JOB#: | 1011043 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Arnold | | |
| CLIENT PROJECT: | Normandy Park Baseline GW Sampling | | |

## LABORATORY CONTROL SAMPLE RESULTS

### ALS Test Batch ID: 1220 - Water by EPA-8260

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| 1,1-Dichloroethene - BS | EPA-8260 | **113** | | | 11/05/2010 | GAP |
| 1,1-Dichloroethene - BSD | EPA-8260 | **110** | **3** | | 11/05/2010 | GAP |
| Benzene - BS | EPA-8260 | **116** | | | 11/05/2010 | GAP |
| Benzene - BSD | EPA-8260 | **115** | **0** | | 11/05/2010 | GAP |
| Trichloroethene - BS | EPA-8260 | **114** | | | 11/05/2010 | GAP |
| Trichloroethene - BSD | EPA-8260 | **114** | **0** | | 11/05/2010 | GAP |
| Toluene - BS | EPA-8260 | **115** | | | 11/05/2010 | GAP |
| Toluene - BSD | EPA-8260 | **115** | **0** | | 11/05/2010 | GAP |
| Chlorobenzene - BS | EPA-8260 | **118** | | | 11/05/2010 | GAP |
| Chlorobenzene - BSD | EPA-8260 | **118** | **0** | | 11/05/2010 | GAP |

### ALS Test Batch ID: 1239 - Water by EPA-6020

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| Iron - BS | EPA-6020 (Dissolved) | **95.5** | | | 11/16/2010 | RAL |
| Iron - BSD | EPA-6020 (Dissolved) | **96.4** | **0** | | 11/16/2010 | RAL |
| Manganese - BS | EPA-6020 (Dissolved) | **94.4** | | | 11/16/2010 | RAL |
| Manganese - BSD | EPA-6020 (Dissolved) | **94.4** | **0** | | 11/16/2010 | RAL |
| Potassium - BS | EPA-6020 (Dissolved) | **90.4** | | | 11/16/2010 | RAL |
| Potassium - BSD | EPA-6020 (Dissolved) | **90.6** | **0** | | 11/16/2010 | RAL |

APPROVED BY:

Laboratory Director



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12 January 2012

*Via Electronic Mail*

Ms. Courtney Seim
Riddell Williams, P.S.
1001 Fourth Avenue Plaza, Suite 4500
Seattle, Washington 98154-1065

Mr. Robert L. DiJulio
Wolfstone, Panchot & Bloch, P.S., Inc.
1111 Third Avenue, Suite 1800
Seattle, Washington 98101

Subject: In Situ Chemical Oxidation Pilot Study Completion Report

Dear Ms. Seim and Mr. DiJulio:

ERM-West, Inc. (ERM) has prepared this summary of the in situ chemical oxidation (ISCO) pilot study conducted at the Harris and Manhattan Village Shopping Center (MVSC) properties located in Normandy Park, Washington (the "site"). The site location is shown on Figure 1. The pilot study was performed in substantive compliance with the March 2011 *Final In Situ Chemical Oxidation Pilot Study Work Plan* (the Work Plan).

As outlined in the Work Plan, the goal of the pilot study was to evaluate the effectiveness of ISCO using potassium permanganate injection as a remedy for tetrachlorethene (PCE) in site groundwater. Specific objectives designed to achieve this goal are:

- Evaluate the effectiveness of the in situ chemical oxidation technology at reducing the mass of PCE in groundwater in the source zone at the site; and
- Establish key design parameters for a full-scale chemical oxidation program to reduce PCE concentrations in groundwater across the site.

To achieve these objectives, in situ chemical oxidation was applied to a limited area (target area) of the site, characterized as being a probable source of the contamination (source zone).

## *PILOT TEST SCOPE OF WORK*

ERM completed the following tasks as part of the in situ chemical oxidation pilot test:

- Collection and analysis of baseline groundwater quality samples from 15 monitoring wells within and near the target area (November 2010);
- Injection of approximately 30,000 gallons of approximately 2.5 percent potassium permanganate aqueous solution at 15 locations within the target area (April 2011); and
- Collection and analysis of progress monitoring groundwater quality samples from 15 monitoring wells within and near the target area at one month, three months, and six months after injection (May 2011, July 2011, and October 2011).

Details regarding these activities are presented in the Work Plan. The locations of the permanganate injections and the baseline and performance monitoring wells are shown on Figure 2. Baseline and performance monitoring groundwater quality data observed during the pilot study for PCE concentrations as well as observations of coloration caused by the permanganate injections are summarized in Table 1 and are shown on Figure 3. A complete history of available groundwater PCE analytical data for site monitoring wells is included in Table 2. Other volatile organic compounds (VOCs) detected in groundwater (not including PCE) are presented in Table 3. Dissolved metals data observed during the pilot study are included in Table 4. Laboratory analytical reports for the samples collected during the pilot study are included as Attachment A.

Groundwater flow across the site, observed during monitoring activities associated with the pilot study, was generally toward the north. In February 2011, the gradient to the south of SW 178$^{th}$ street was approximately 0.005, increasing to 0.026 to the north of SW 178$^{th}$ street. These results are consistent with previous observations. Groundwater elevations measured during the pilot study are included in Table 5. Groundwater elevations and the flow direction observed in February 2011 (baseline) and October 2011 (final pilot study monitoring event) are included as Figures 4 and 5 respectively. Table 6 provides a summary of the volume of the injections during each day of operation.

## *FIELD IMPLEMENTATION*

As discussed in the Work Plan, a 2.5 percent solution of potassium permanganate was prepared and injected into the 15 injection points shown on Figure 2. At 14 of the injection points, a direct-push drilling system rod string was inserted into the ground and a manifold injection system was used to allow the delivery of the

potassium permanganate solution to multiple boreholes simultaneously. One of the injection points was constructed as a permanent well. Based on the lithology, the inferred hydraulic conductivity, and ERM's injection experience at similar sites, it was anticipated that the injection pressure would not need to exceed approximately 15 pounds per square inch (psi) in order to achieve the design flow rate of approximately 4 gallons per minute (gpm) at each injection point.

As discussed in the Work Plan, the potassium permanganate solution was premixed at an off-site location to the target concentration of 2.5 percent by weight, and then delivered to the site via tanker truck. A staging area enclosed with a chain link fence was set up in the parking lot of the MVSC that included a tank staging area with secondary containment, the injection pump and manifold, a generator, and a storage trailer to store the manifold along with ancillary injection equipment and supplies.

Prior to initiating drilling at each injection point, the location of underground utilities was evaluated by calling the public One Call service, review of each boring location by a private utility locator, and completion of a pilot hole 5 to 7 feet below ground surface (bgs) using an air knife and vacuum truck. Additionally, the location of current and abandoned sanitary sewer lines in the work area on the MVSC property were confirmed using a radio-location device pushed through each line.

At each location where an injection was completed through direct-push boring rods, the rods were inserted to the target depth (approximately 3 feet below the static groundwater level) and retracted approximately 2 feet prior to initiating fluid injection through the direct-push rods. After approximately half of the target volume of solution (approximately 900 gallons) were injected into each boring, the rods were retracted another 3 feet, and the remainder of the solution was injected. Direct-push injection locations are shown on Figure 2 as location IP-1 through IP-15 and IW-1. A summary of solution injection volumes at each point is included in Table 6.

Target injection pressure and rate were achieved at only two of the borings completed (IP-1 and IP-2). At the remaining borings, initial injection rates were typically less than 1 gpm at injection pressures up to 30 psi. To affect a reasonable injection rate, ERM used a high-pressure pump to inject potassium permanganate solution at a pressure of approximately 100 to 200 psi and achieved an injection rate of approximately 7 gpm at each location.

Three sets of direct-push probe rods became stuck at depth at injection points IP-1, IP-3, and IP-7. ERM's drilling subcontractor mobilized a hollow stem auger (HSA) to the site and over drilled the soil around the direct-push rods, allowing them to be safely removed. The permanent injection well IW-1 was constructed during the removal of the direct-push rods at the attempted injection location IP-7. Upon

completion of the injection well, ERM was able to deliver approximately 20 gpm of potassium permanganate solution at a pressure of approximately 15 psi at this location.

## *RESULTS AND DISCUSSION*

### *Groundwater Elevations and Flow Direction*

As shown on Table 5, monitoring results over the last four quarters suggest groundwater is approximately 35 – 40 feet bgs, and the groundwater elevation seasonally fluctuates by approximately 3 feet. As shown on Figures 4 and 5 the direction of groundwater flow is predominantly to the north. The gradient typically averages 0.005 across the MVSC and Harris properties and increases to approximately 0.026 to the north of 178$^{th}$ street.

### *Other VOCs Detected in Groundwater*

As shown on Table 3, low concentrations of bromodichloromethane, chloroform, cis-1,2-dichloroethene, and trichloroethene were detected in some groundwater samples collected during a sampling event in 2008. Since that time, none of these compounds have been detected in groundwater samples collected from the site.

### *Metals Concentrations in Groundwater*

Groundwater samples were analyzed for dissolved iron, manganese, and potassium. When iron is present in groundwater it can react preferentially with potassium permanganate, interfering with the oxidation of PCE. As shown in Table 4, iron has been periodically observed in three of the 15 performance monitoring wells. However, the extent and concentration of iron dissolved in groundwater is not expected to prevent effective remediation using potassium permanganate.

Manganese is present in potassium permanganate and concentrations of dissolved manganese typically increase in groundwater after potassium permanganate solution is injected. As the potassium permanganate is consumed by chemical reactions, manganese dioxide is formed as a solid precipitate in the soil and dissolved manganese concentrations in groundwater typically decrease to near background concentrations. As shown on Table 4, dissolved manganese was typically not detected in groundwater prior to the injections, and after the injections the concentrations increased. The concentration of manganese in groundwater subsequently decreased as the potassium permanganate was consumed. There is a direct and consistent relationship between observations of purple coloration in groundwater indicative of the presence of significant concentrations of dissolves

potassium permanganate and the presence of elevated concentrations of dissolved manganese in the groundwater.

Potassium is also present in potassium permanganate and dissolves in groundwater when potassium permanganate is injected. The concentration of potassium increased significantly (at least doubled in concentration) after the injection of potassium permanganate at four of the 15 performance monitoring wells. Dissolved potassium typically remains in solution in groundwater after the potassium permanganate is chemically consumed, but is not considered a harmful compound. Over time, potassium concentrations are expected to naturally attenuate through advection and dispersion.

***Extent and Distribution of Potassium Permanganate and Effects on Dissolved PCE***

The performance monitoring well locations and the concentrations of PCE observed in groundwater at these wells during the pilot study are shown on Figure 3.

The pilot study performance monitoring data indicate that potassium permanganate successfully destroyed PCE mass within the target area. The concentration of PCE at wells within the source zone (DC-4, MW-4, and KMW-2) generally decreased after the injection, and then recovered to near pre-injection levels by the end of the six-month monitoring period. Rebound in the suspected source area is likely to be caused through two mechanisms: 1) advection of untreated upgradient groundwater into the treatment area due to the limited scope of the pilot study injections; and 2) dispersion or advection from a residual untreated contaminant mass in the vadose zone. It is possible that the rebound is caused by a combination of both these mechanisms.

The concentration of PCE at monitoring wells downgradient of the source area, but within the treatment area (DC-10B, DC-17, MW-10 and MW-11), decreased to below detection levels and generally did not recover to concentrations greater than the cleanup standard of 5 micrograms per liter (µg/l). Groundwater in wells located a distance downgradient and outside of the treatment area (DC-7, DC-8, KMW-3, and KMW-7) did not demonstrate changes in PCE concentrations attributable to the pilot test activities. Similarly, wells upgradient and side-gradient from the demonstrated area of influence of injection activities (DC-2, DC-3, and MW-3) did not exhibit changes in groundwater quality attributable to the pilot test program. Relevant specific observations made at the monitoring wells are discussed in the following sections.

Key data for evaluating the pilot study include the color of the groundwater in the monitoring wells in the injection zone, as well as the concentration of PCE in the groundwater. A potassium permanganate concentration of 2.5 percent in water is dark purple in color. As it becomes less concentrated (due to advection and oxidation of PCE, and potentially other compounds) it fades to lighter shades of purple and

pink, visible to concentrations as low as 1 part per million. Once the potassium permanganate is fully consumed, the groundwater returns to its natural clarity.

Table 1 and Figure 3 include observations of groundwater color in the performance monitoring wells for the duration of the pilot study to provide a comparison of PCE concentrations with permanganate presence in groundwater.

*Wells Outside of Treatment Area*

Monitoring wells DC-2, DC-3, DC-7, DC-8, KMW-3, KMW-7, and MW-3 are located upgradient, downgradient, or side-gradient of the expected radius of influence of the injection. As anticipated, no change in groundwater coloration or significant changes in PCE concentration were observed at these monitoring wells during the monitoring period.

Monitoring wells DC-3 and MW-3 are both located upgradient of injection points. No potassium permanganate was observed at either location and the concentration of PCE in groundwater did not appear to be affected by the potassium permanganate injections, suggesting that the effective upgradient radius of influence at each injection point is less than approximately 15 feet.

The concentration of PCE detected in the groundwater sample collected from well MW-3 in October 2011 was the highest observed since 2008, when groundwater sampling at that well began (see Table 1). Available information suggests that this result is not related to the injections and represents the natural variability of the groundwater concentration at this location. The presence of PCE in groundwater at this location at a concentration greater than the MTCA Method A cleanup level of 5 µg/L suggests residual PCE contamination is likely present in soils located upgradient of the target injection area of the pilot study.

*Wells within Treatment Area, Downgradient of Source Area*

Monitoring wells DC-10B, DC-17, MW-10, and MW-11 are positioned downgradient of the suspected PCE source area. Also, groundwater at each well contained detectable concentrations of PCE during the baseline groundwater sampling event in November 2010. One month after injection, the groundwater at each well, except for MW-10, was light to dark purple in color. No PCE was detected in the groundwater in each of the wells. Note that well DC-17 is approximately 90 feet downgradient of the nearest injection point, establishing the maximum observed downgradient influence from the injection program.

The groundwater in wells DC-10B and MW-11 retained some degree of coloration when observed during the three and six month sampling events, and concentrations

of PCE remained less than the detection limit in groundwater at each well except MW-10, in which PCE concentrations remained less than the cleanup objective of 5 µg/L.

The observations made at these wells downgradient of the PCE source area indicate:

- The potassium permanganate effectively eliminated PCE dissolved in the aquifer in the vicinity of these monitoring wells;
- Natural Oxidant Demand (NOD) is sufficiently low at the site to allow potassium permanganate to persist in groundwater for several months; and
- The maximum observed downgradient influence of potassium permanganate solution during the pilot test was approximately 90 feet, but heterogeneous flow conditions at the site are affecting downgradient permanganate solution dispersal.

*Wells Within Treatment Area and Within the Source Area*

Monitoring wells DC-4, KMW-2, and MW-4 are located within an apparent PCE source area along the former sanitary sewer (the suspected source of PCE in groundwater) alignment in that area. Potassium permanganate solution was injected in the vicinity of each well and dark purple (greater than 0.5 percent) potassium permanganate was observed at each of these three locations. At each monitoring well, the observation of dark purple coloration in groundwater coincided with a significant reduction in the concentration of PCE in groundwater.

As the pilot study progressed through the three and six month monitoring events, the coloration diminished at each monitoring well, and the concentration of PCE dissolved in the groundwater increased to approximately pre-injection concentrations. During the six month monitoring event, groundwater at each of the three wells was clear. The complete consumption of the potassium permanganate solution, as well as the rebound of PCE concentrations at these locations, suggests that sufficient potassium permanganate was not injected in this area to overcome the in-flux of PCE. Potential sources of the PCE into this area include contaminated upgradient groundwater which advected into the treatment area, or dispersion and/or advection from a residual untreated contaminant mass in the vadose zone. It is possible that the rebound is caused by a combination of both these mechanisms. Advection from upradient areas is commonly observed in pilot-scale programs where the areal extent of the injections is necessarily relatively small; and recent sampling results from the soil vapor extraction (SVE) system suggest that while the vadose zone is being effectively remediated by the SVE system, some contamination is still present.

## *CONCLUSIONS AND RECOMMENDATIONS*

The radius of influence around each injection point was evaluated using observations of color in the groundwater at the performance monitoring wells. Based on these observations, the maximum downgradient radius of influence was approximately 90 feet. The upgradient radius of influence is assumed to between approximately 5 and 15 feet and the side-gradient radius of influence is approximately 10 - 15 feet.

Significant rebound of PCE concentrations were observed only at monitoring wells located within the upgradient portion of the source area (DC-4, KMW-2, and MW-4). At monitoring wells within the radius of influence of the pilot study, but outside the source area, PCE concentrations were reduced and either remained less than detection limits or at concentrations less than the cleanup target of 5 µg/L.

Based on the results of the pilot study, ERM concludes the following:

- The pilot study monitoring has demonstrated that permanganate is capable of effectively reducing PCE mass in groundwater;
- The observed radii of influence from the injections are sufficient for full-scale treatment; and
- While PCE concentration rebound was observed within the upgradient portion of the source area after initial reductions during the pilot test, it has been demonstrated that sustained mass reductions can be achieved when the source zone is adequately addressed and sufficient permanganate solution is applied to the groundwater.

Based on the observations from the pilot study, the following actions are recommended:

- An injection program is appropriate for implementation at the site to remediate PCE in groundwater.
- Injection point installation should take into account the flowing-sand-like conditions in some parts of the site aquifer so that injection rates can be maximized at each location.
- The mass of permanganate delivered to the source area should be increased to effect more complete destruction of residual PCE in contact with the aquifer. If difficulty is encountered injecting the necessary volume of potassium permanganate, then sodium permanganate solution may be used. Sodium permanganate typically is available as a 40-percent solution and is typically

diluted to approximately 20 percent for injection (as compared to a maximum of less than 2.5 percent solution achievable using potassium permanganate at standard temperatures).

## *PROGRAMMATIC RECOMMENDATIONS*

The results of the pilot study should provide the basis for completing the Feasibility Study, with in situ chemical oxidation presented as a technology option, and as a remedial alternative subject to evaluation under the relevant balancing criteria. It is anticipated that soil vapor extraction, and in situ chemical oxidation combined with natural attenuation, will be the preferred alternatives for soil and groundwater treatment, respectively.

Following the development of the final feasibility study, a work plan should be prepared outlining the implementation of the full-scale chemical oxidation program on the MVSC and Harris properties. The work plan will be written to allow for multiple rounds of injection if required and may include the use of both sodium and potassium permanganate. Full-scale groundwater remediation should then be implemented based on the program outlined in the work plan.

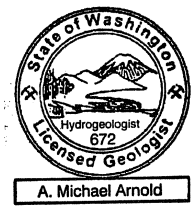
We appreciate the opportunity to provide you with ongoing environmental consulting. Please call Mike Arnold at (425) 214-0454 if you have questions regarding this progress report.

Sincerely,

Josh Hancock
*Project Manager*

Erik C. Ipsen, P.E.
*Partner-in-Charge*

A. Michael Arnold, R.G.
*Senior Hydrogeologist*

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Attachments

*Tables*

**Table 1**

*Tetrachloroethene in Groundwater and Color Observations*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Color Observed[1] | Tetrachloroethene (µg/L) |
|---|---|---|---|
| MW-3 | 11/1/2010 | No Color | **2.9** |
| | 4/28/2011 | No Color | NS |
| | 5/31/2011 | No Color | <2 |
| | 7/20/2011 | No Color | <2 |
| | 10/18/2011 | No Color | **6.1** |
| MW-4 | 11/1/2010 | No Color | **16** |
| | 4/28/2011 | **Dark Purple** | NS |
| | 5/31/2011 | **Medium Pink** | **10** |
| | 7/21/2011 | No Color | **25** |
| | 10/19/2011 | No Color | **21** |
| MW-10 | 11/1/2010 | No Color | **10** |
| | 4/28/2011 | No Color | NS |
| | 5/31/2011 | No Color | <2 |
| | 7/20/2011 | No Color | **4.1** |
| | 10/18/2011 | No Color | **4.9** |
| MW-11 | 11/1/2010 | No Color | **47** |
| | 4/28/2011 | No Color | NS |
| | 5/31/2011 | **Dark Purple** | <2 |
| | 7/20/2011 | **Dark Purple** | <2 |
| | 10/18/2011 | **Medium Purple** | <2 |
| KMW-2 | 11/1/2010 | No Color | **74** |
| | 4/28/2011 | **Dark Purple** | NS |
| | 6/1/2011 | **Medium Purple** | **12** |
| | 7/20/2011 | **Light Pink** | **44** |
| | 10/19/2011 | No Color | **40** |
| KMW-3 | 11/1/2010 | No Color | **11** |
| | 4/28/2011 | No Color | NS |
| | 5/31/2011 | No Color | **6.2** |
| | 7/20/2011 | No Color | **12** |
| | 10/18/2011 | No Color | **11** |
| KMW-7 | 11/1/2010 | No Color | <2 |
| | 4/28/2011 | No Color | NS |
| | 5/30/2011 | No Color | **2.3** |
| | 7/20/2011 | No Color | <2 |
| | 10/18/2011 | No Color | <2 |
| DC-2 | 11/1/2010 | No Color | <2 |
| | 4/28/2011 | No Color | NS |
| | 5/31/2011 | No Color | <2 |
| | 7/21/2011 | No Color | <2 |
| | 10/18/2011 | No Color | <2 |
| DC-3 | 11/1/2010 | No Color | <2 |
| | 4/28/2011 | No Color | NS |
| | 5/30/2011 | No Color | **3.9** |
| | 7/20/2011 | No Color | **12** |
| | 10/18/2011 | No Color | **6.7** |

**Table 1**

*Tetrachloroethene in Groundwater and Color Observations*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Color Observed[1] | Tetrachloroethene (µg/L) |
|---|---|---|---|
| DC-4 | 11/1/2010 | No Color | **13** |
| | 4/28/2011 | No Color | NS |
| | 5/31/2011 | **Dark Purple** | <2 |
| | 7/20/2011 | **Medium Purple** | <2 |
| | 10/18/2011 | No Color | **22** |
| DC-7 | 11/1/2010 | No Color | **34** |
| | 4/28/2011 | No Color | NS |
| | 6/1/2011 | No Color | **15** |
| | 7/21/2011 | No Color | **38** |
| | 10/18/2011 | No Color | **42** |
| DC-8 | 11/1/2010 | No Color | **25** |
| | 4/28/2011 | No Color | NS |
| | 6/1/2011 | No Color | **11** |
| | 7/21/2011 | No Color | **25** |
| | 10/19/2011 | No Color | **26** |
| DC-10B | 11/1/2010 | No Color | **2.6** |
| | 4/28/2011 | No Color | NS |
| | 5/30/2011 | **Dark Purple** | <2 |
| | 7/19/2011 | **Medium Purple** | <2 |
| | 10/18/2011 | **Light Pink** | <2 |
| DC-16 | 11/1/2010 | No Color | <2 |
| | 4/28/2011 | No Color | NS |
| | 5/31/2011 | No Color | <2 |
| | 7/19/2011 | No Color | <2 |
| | 10/18/2011 | No Color | <2 |
| DC-17 | 11/1/2010 | No Color | **2.1** |
| | 4/28/2011 | No Color | NS |
| | 5/30/2011 | **Light Pink** | <2 |
| | 7/19/2011 | No Color | <2 |
| | 10/18/2011 | No Color | <2 |
| Model Toxics Control Act Method A Groundwater Cleanup Level | | Not Applicable | 5.0 |

**Notes:**

**Bold** entries indicate positive analyte detections.

Shaded cells indicate concentrations greater than the cleanup goal.

NS = No sample collected for analysis

µg/L = micrograms per liter

[1] This column refers to the color of the groundwater removed from the well during sampling, and is an indication of the concentration of potassium permanganate in the groundwater, i.e. the darker the color the greater the concentration.

**Table 2**

*Tetrachloroethene in Groundwater - Full Site History*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (µg/L) | Qualifiers |
|---|---|---|---|
| MW-1 | 4/11/2006 | **14** | |
| | 10/26/2006 | **11** | |
| | 4/25/2007 | **13** | |
| MW-3 | 4/14/2008 | **2.3** | |
| | 11/1/2010 | **2.9** | |
| | 5/31/2011 | <2 | |
| | 7/20/2011 | <2 | |
| | 10/18/2011 | **6.1** | |
| MW-4 | 4/14/2008 | **32.6** | |
| | 3/9/2010 | **7.8** | |
| | 11/1/2010 | **16** | |
| | 5/31/2011 | **10** | |
| | 7/21/2011 | **25** | |
| | 10/19/2011 | **21** | |
| MW-5 | 4/11/2008 | **0.5** | |
| MW-6 | 4/15/2008 | **2.0** | |
| MW-7 | 4/16/2008 | **22.4** | |
| MW-8 | 8/21/2008 | **0.2** | J |
| MW-9 | 8/21/2008 | **0.1** | J |
| MW-9A | 11/2/2006 | **2.9** | |
| MW-10 | 2/8/2011 | **10.0** | |
| | 5/31/2011 | <2 | |
| | 7/20/2011 | **4.1** | |
| | 10/18/2011 | **4.9** | |
| MW-11 | 2/8/2011 | **47.0** | |
| | 5/31/2011 | <2 | |
| | 7/20/2011 | <2 | |
| | 10/18/2011 | <2 | |
| KMW-1 | 4/11/2006 | <1 | |
| | 10/26/2006 | <1 | |
| | 4/25/2007 | <0.2 | |
| | 4/14/2008 | <0.2 | |
| KMW-2 | 6/12/2006 | **130** | |
| | 8/8/2006 | **130** | |
| | 10/26/2006 | **190** | J |
| | 4/24/2007 | **63** | |
| | 4/16/2008 | **95.8** | |
| | 3/8/2010 | **81** | |
| | 11/3/2010 | **74** | |
| | 6/1/2011 | **12** | |
| | 7/20/2011 | **44** | |
| | 10/19/2011 | **40** | |
| KMW-3 | 6/12/2006 | **20** | |
| | 10/26/2006 | **13** | |
| | 4/24/2007 | **9.9** | |
| | 11/2/2010 | **11** | |
| | 5/31/2011 | **6.2** | |
| | 7/20/2011 | **12** | |
| | 10/18/2011 | **11** | |
| KMW-4 | 4/25/2007 | **0.7** | |
| KMW-5 | 4/25/2007 | **0.8** | |
| KMW-5D | 4/25/2007 | <0.2 | |
| KMW-6 | 4/24/2007 | **3.8** | |

**Table 2**

*Tetrachloroethene in Groundwater - Full Site History*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (µg/L) | Qualifiers |
|---|---|---|---|
| KMW-7 | 4/24/2007 | **3.8** | |
| | 4/15/2008 | **3.9** | |
| | 11/3/2010 | <2 | |
| | 5/30/2011 | **2.3** | |
| | 7/20/2011 | <2 | |
| | 10/18/2011 | <2 | |
| KMW-8 | 4/24/2007 | **11** | |
| | 4/15/2008 | **17.4** | |
| KMW-9 | 4/26/2007 | **9.3** | |
| | 3/8/2010 | **4.4** | |
| | 11/4/2010 | **2.8** | |
| DC-1 | 10/21/1998 | **0.6** | |
| | 2/3/1999 | ND[1] | |
| | 4/7/1999 | ND[1] | |
| | 12/8/1999 | ND[1] | |
| | 4/26/2000 | ND[1] | |
| | 8/3/2000 | ND[1] | |
| | 11/14/2000 | ND[1] | |
| | 3/6/2001 | ND[1] | |
| | 6/20/2001 | ND[1] | |
| | 9/17/2001 | ND[1] | |
| | 12/20/2001 | ND[1] | |
| | 3/13/2002 | ND[1] | |
| | 6/13/2002 | NS | |
| | 9/17/2002 | ND[1] | |
| | 12/10/2002 | ND[1] | |
| | 3/31/2003 | ND[1] | |
| | 9/3/2003 | ND[1] | |
| | 3/16/2004 | ND[1] | |
| | 9/7/2004 | ND[1] | |
| | 4/25/2007 | <0.2 | |
| DC-2 | 10/21/1998 | **2.4** | |
| | 2/3/1999 | **0.7** | |
| | 4/7/1999 | ND[1] | |
| | 12/8/1999 | ND[1] | |
| | 4/26/2000 | ND[1] | |
| | 8/3/2000 | ND[1] | |
| | 11/14/2000 | ND[1] | |
| | 3/6/2001 | ND[1] | |
| | 6/20/2001 | ND[1] | |
| | 9/17/2001 | ND[1] | |
| | 12/20/2001 | ND[1] | |
| | 3/13/2002 | **4.0** | |
| | 6/13/2002 | ND[1] | |
| | 9/17/2002 | ND[1] | |
| | 12/10/2002 | **0.5** | J |
| | 3/31/2003 | **3.37** | |
| | 9/3/2003 | ND[1] | |
| | 3/16/2004 | **0.7** | J |
| | 9/7/2004 | ND[1] | |
| | 4/26/2007 | **1.2** | |
| | 4/14/2008 | **0.3** | |
| | 11/3/2010 | <2 | |
| | 5/31/2011 | <2 | |
| | 7/21/2011 | <2 | |
| | 10/18/2011 | <2 | |

**Table 2**

*Tetrachloroethene in Groundwater - Full Site History*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (µg/L) | Qualifiers |
|---|---|---|---|
| DC-3 | 10/28/1998 | **54** | |
| | 2/4/1999 | **25** | |
| | 4/8/1999 | **36** | |
| | 12/8/1999 | **45** | |
| | 4/26/2000 | **56** | |
| | 8/3/2000 | **25** | |
| | 11/14/2000 | ND[1] | |
| | 3/6/2001 | **4.7** | |
| | 6/20/2001 | **2.8** | |
| | 9/17/2001 | ND[1] | |
| | 12/20/2001 | **9.2** | |
| | 3/13/2002 | **40** | |
| | 6/13/2002 | **42.3** | |
| | 9/17/2002 | **33.4** | |
| | 12/10/2002 | **5.4** | |
| | 3/31/2003 | **7.3** | |
| | 9/3/2003 | **2.1** | |
| | 3/16/2004 | ND[1] | |
| | 9/7/2004 | **3.4** | |
| | 4/26/2007 | **42** | |
| | 4/14/2008 | **27.8** | |
| | 3/9/2010 | <2 | |
| | 11/3/2010 | <2 | |
| | 5/30/2011 | **3.9** | |
| | 7/20/2011 | **12** | |
| | 10/18/2011 | **6.7** | |
| DC-4 | 10/28/1998 | **227** | |
| | 2/4/1999 | **144** | |
| | 4/8/1999 | **110** | |
| | 12/8/1999 | **71** | |
| | 4/26/2000 | **120** | |
| | 8/3/2000 | **42** | |
| | 11/14/2000 | **64** | |
| | 3/6/2001 | **52** | |
| | 6/20/2001 | **40** | |
| | 9/17/2001 | **23** | |
| | 12/20/2001 | **15** | |
| | 3/13/2002 | **55** | |
| | 6/13/2002 | **17.9** | |
| | 9/17/2002 | **28.8** | |
| | 12/10/2002 | **22.4** | |
| | 3/31/2003 | **12.5** | |
| | 9/3/2003 | **14.1** | |
| | 3/16/2004 | **19.8** | |
| | 9/7/2004 | **18.5** | |
| | 4/26/2007 | **19** | |
| | 4/11/2008 | **30.2** | |
| | 3/9/2010 | **9.2** | |
| | 11/3/2010 | **13** | |
| | 5/31/2011 | <2 | |
| | 7/20/2011 | <2 | |
| | 10/18/2011 | **22** | |
| DC-5 | 2/4/1999 | **2.4** | |
| | 4/8/1999 | **1.6** | |
| | 4/11/2006 | **1.3** | |
| | 4/26/2007 | **2.1** | |
| DC-6 | 2/4/1999 | **5.1** | |
| | 4/8/1999 | **3.7** | |

**Table 2**

*Tetrachloroethene in Groundwater - Full Site History*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (µg/L) | Qualifiers |
|---|---|---|---|
| DC-7 | 2/4/1999 | **74** | |
| | 4/8/1999 | **64** | |
| | 12/8/1999 | **107** | |
| | 4/26/2000 | **130** | |
| | 8/3/2000 | **50** | |
| | 11/14/2000 | **130** | |
| | 3/6/2001 | **140** | |
| | 6/20/2001 | **96** | |
| | 9/17/2001 | **81** | |
| | 12/20/2001 | **47** | |
| | 3/13/2002 | **31** | |
| | 6/13/2002 | **41.5** | |
| | 9/17/2002 | **77.7** | |
| | 12/10/2002 | **91.8** | |
| | 3/31/2003 | **40.1** | |
| | 9/3/2003 | **57.4** | |
| | 4/11/2006 | **23** | |
| | 10/26/2006 | **51** | |
| | 4/24/2007 | **27** | |
| | 4/16/2010 | **50.8** | |
| | 11/3/2010 | **34** | |
| | 6/1/2011 | **15** | |
| | 7/21/2011 | **38** | |
| | 10/18/2011 | **42** | |
| DC-8 | 2/4/1999 | **56** | |
| | 4/8/1999 | **48** | |
| | 12/8/1999 | **98** | |
| | 4/26/2000 | **87** | |
| | 8/3/2000 | **70** | |
| | 11/14/2000 | **130** | |
| | 3/6/2001 | **82** | |
| | 6/20/2001 | **80** | |
| | 9/17/2001 | **62** | |
| | 12/20/2001 | **50** | |
| | 3/13/2002 | **31** | |
| | 6/13/2002 | **26.6** | |
| | 9/17/2002 | **38.4** | |
| | 12/10/2002 | **53.1** | |
| | 3/31/2003 | **36.4** | |
| | 9/3/2003 | **34.7** | |
| | 4/11/2006 | **14** | |
| | 10/26/2006 | **28** | |
| | 4/24/2007 | **24** | |
| | 4/16/2010 | **39.4** | |
| | 11/3/2010 | **25** | |
| | 6/1/2011 | **11** | |
| | 7/21/2011 | **25** | |
| | 10/19/2011 | **26** | |
| DC-9A | 4/8/1999 | **135** | |
| | 12/8/1999 | **73** | |
| | 4/26/2000 | **240** | |
| | 8/3/2000 | **110** | |
| | 11/14/2000 | NS | |
| | 4/11/2006 | **78** | |
| | 8/8/2006 | **49** | |
| | 4/26/2007 | **33** | |

**Table 2**

*Tetrachloroethene in Groundwater - Full Site History*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (µg/L) | Qualifiers |
|---|---|---|---|
| DC-9B | 4/8/1999 | **1.4** | |
| | 3/6/2001 | **2.0** | |
| | 6/20/2001 | ND[1] | |
| | 9/17/2001 | ND[1] | |
| | 4/11/2006 | <1 | |
| | 8/8/2006 | <1 | |
| | 10/26/2006 | <1 | |
| | 4/26/2007 | <0.2 | |
| | 4/15/2008 | **0.6** | |
| DC-10A | 4/8/1999 | **150** [2] | |
| | 12/8/1999 | **73** | |
| | 4/26/2000 | **210** | |
| | 8/3/2000 | NS | |
| | 11/14/2000 | NS | |
| DC-10B | 4/8/1999 | **1.9** | |
| | 3/6/2001 | **3.3** | |
| | 6/20/2001 | **2.4** | |
| | 9/17/2001 | ND[1] | |
| | 12/20/2001 | ND[1] | |
| | 4/11/2006 | <1 | |
| | 4/26/2007 | **0.3** | |
| | 11/3/2010 | **2.6** | |
| | 5/30/2011 | <2 | |
| | 7/19/2011 | <2 | |
| | 10/18/2011 | <2 | |
| DC-11 | 4/26/2007 | **12** | |
| | 3/9/2010 | **4.6** | |
| | 11/1/2010 | **4.8** | |
| DC-13 | 4/25/2007 | **15** | |
| | 4/16/2008 | **23** | |
| | 3/1/2010 | **10** | |
| | 11/2/2010 | **9.2** | |
| DC-16 | 4/25/2007 | **0.4** | |
| | 11/5/2010 | <2 | |
| | 5/31/2011 | <2 | |
| | 7/19/2011 | <2 | |
| | 10/18/2011 | <2 | |
| DC-17 | 4/25/2007 | **47** | |
| | 4/16/2008 | **74.6** | |
| | 11/3/2010 | **2.1** | |
| | 5/30/2011 | <2 | |
| | 7/19/2011 | <2 | |
| | 10/18/2011 | <2 | |
| DC-18 | 4/25/2007 | **19** | |
| DC-19 | 4/14/2008 | **0.7** | |
| Model Toxics Control Act Method A Groundwater Cleanup Level | | 5.0 | |

**Notes:**

**Bold** entries indicate positive analyte detections.

Shaded cells indicate concentrations greater than the cleanup goal.

J = Estimated Value

ND = Not Detected

NS = Not Sampled

µg/l = micrograms per liter

[1]The detection limit is was not provided in SCS's data summary table, and the original laboratory report is not available.

[2]This value is reported as 135 micrograms per liter in the 2004 Annual Groundwater Report and 150 micrograms per liter in the 1999 Site Assessment both conducted by SCS. The original laboratory report is not available, so the concentration cannot be confirmed.

**Table 3**

*Other Volatile Organic Compounds in Groundwater (2008-2011)*
*In Situ Chemical Oxidation Pilot Study*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Boring/Well Number | Date Sampled | Volatile Organic Compounds[1] (µg/L) | | | |
|---|---|---|---|---|---|
| | | Bromodichloro-methane | Chloroform | cis-1,2-Dichloroethene | Trichloro-ethene |
| *Collected from Soil Borings* | | | | | |
| B-5 | 3/26/2008 | <0.200 | **0.960** | <0.200 | <0.200 |
| B-8 | 3/26/2008 | <0.200 | <0.200 | <0.200 | <0.200 |
| B-16 | 3/26/2008 | <0.200 | <0.200 | <0.200 | <0.200 |
| B-17 | 3/26/2008 | <0.200 | **0.690** | <0.200 | <0.200 |
| B-18 | 3/24/2008 | <0.200 | **0.270** | <0.200 | <0.200 |
| *Collected from Monitoring Wells* | | | | | |
| MW-3 | 4/14/2008 | <0.200 | **0.990** | <0.200 | <0.200 |
| | 11/1/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 5/31/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/20/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/18/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| MW-4 | 4/14/2008 | <0.200 | **0.780** | **0.320** | **0.490** |
| | 3/9/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 11/1/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 5/31/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/21/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/19/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| MW-5 | 4/11/2008 | <0.200 | <0.200 | <0.200 | <0.200 |
| MW-6 | 4/15/2008 | <0.200 | <0.200 | <0.200 | <0.200 |
| MW-7 | 4/16/2008 | <0.200 | **1.12** | <0.200 | <0.200 |
| MW-8 | 8/21/2008 | <0.1 | **0.3 J** | <0.1 | <0.1 |
| MW-9 | 8/21/2008 | <0.1 | **0.4 J** | <0.1 | <0.1 |
| MW-10[2] | 2/8/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 5/31/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/20/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/18/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| MW-11[3] | 2/8/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 5/31/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/20/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/18/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| KMW-1 | 4/14/2008 | <0.200 | **0.450** | <0.200 | <0.200 |
| KMW-2 | 4/16/2008 | <0.200 | **0.640** | <0.200 | **0.230** |
| | 3/8/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 6/1/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/20/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/19/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| KMW-3 | 11/2/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 5/31/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/20/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/18/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| KMW-7 | 4/15/2008 | <0.200 | **1.33** | <0.200 | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 5/30/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/20/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/18/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| KMW-8 | 4/15/2008 | **0.310** | **1.13** | <0.200 | <0.200 |
| KMW-9 | 3/8/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 11/4/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-2 | 4/14/2008 | <0.200 | **1.60** | <0.200 | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 5/31/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/21/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/18/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-3 | 4/14/2008 | <0.200 | **1.50** | <0.200 | <0.200 |
| | 3/9/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 5/30/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/20/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/18/2011 | <2.0 | <2.0 | <2.0 | <2.0 |

**Table 3**

*Other Volatile Organic Compounds in Groundwater (2008-2011)*
*In Situ Chemical Oxidation Pilot Study*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Boring/Well Number | Date Sampled | Volatile Organic Compounds[1] (µg/L) | | | |
|---|---|---|---|---|---|
| | | Bromodichloro-methane | Chloroform | cis-1,2-Dichloroethene | Trichloro-ethene |
| DC-4 | 4/11/2008 | <0.200 | **1.20** | <0.200 | <0.200 |
| | 3/9/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 5/31/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/20/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/18/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-5 | 2/8/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-7 | 4/16/2008 | <0.200 | **1.08** | <0.200 | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 6/1/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/21/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/18/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-8 | 4/16/2008 | <0.200 | **0.370** | <0.200 | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 6/1/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/21/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/19/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-9B | 4/15/2008 | <0.200 | **1.27** | <0.200 | <0.200 |
| DC-10B | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 5/30/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/19/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/18/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC--11 | 3/9/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 11/1/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-13 | 4/16/2008 | <0.200 | **0.280** | <0.200 | <0.200 |
| | 3/8/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 11/2/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-16 | 11/5/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 5/31/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/19/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/18/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-17 | 4/16/2008 | <0.200 | **0.750** | <0.200 | <0.200 |
| | 11/3/2010 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 5/30/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 7/19/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| | 10/18/2011 | <2.0 | <2.0 | <2.0 | <2.0 |
| DC-19 | 4/14/2008 | <0.200 | <0.200 | <0.200 | <0.200 |
| | ***Cleanup Goal*** | 0.71[4] | 7.17[4] | 80[5] | 5[6] |

**Notes:**
**Bold** entries indicate analyte detections.

[1]Halogenated volatile organic compounds by United States Environmental Protection Agency Method 8260

[2]Well DC-5 was replaced by well MW-10 in February 2011

[3]Well DC-9B was replaced by well MW-11 in February 2011

[4]Model Toxics Control Act Method B Groundwater Cleanup Level (Carcinogenic)

[5]Model Toxics Control Act Method B Groundwater Cleanup Level (Noncarcinogenic)

[6]Model Toxics Control Act Method A Groundwater Cleanup Level

J = Concentration reported as "estimated" by lab
µg/L = Micrograms per liter

**Table 4**

*Dissolved Metals in Groundwater*
*In Situ Chemical Oxidation Pilot Study*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Dissolved Metals[1] (µg/L) | | | | |
|---|---|---|---|---|---|---|
| | | Arsenic | Chromium | Iron | Manganese | Potassium |
| MW-3 | 11/1/2010 | -- | -- | <220 | <3.6 | **2,000** |
| | 5/31/2011 | -- | -- | <220 | **86** | **2,200** |
| | 7/20/2011 | -- | -- | <220 | **35** | **2,000** |
| | 10/18/2011 | -- | -- | <24 | **23** | **1,900** |
| MW-4 | 11/1/2010 | -- | -- | <220 | <3.6 | **2,300** |
| | 5/31/2011 | -- | -- | <220 | **2,500** | **53,000** |
| | 7/21/2011 | -- | -- | <220 | **12** | **91,000** |
| | 10/19/2011 | -- | -- | <24 | <3.6 | **100,000** |
| MW-5 | 4/11/2008 | <1.00 | <1.00 | <150 | **165** | -- |
| MW-6 | 4/15/2008 | <1.00 | <1.00 | <150 | **924** | -- |
| MW-10 | 5/31/2011 | -- | -- | <220 | **39** | **2,400** |
| | 7/20/2011 | -- | -- | <220 | **78** | **2,200** |
| | 10/18/2011 | -- | -- | <24 | **96** | **2,100** |
| MW-11 | 5/31/2011 | -- | -- | <220 | **170,000** | **2,500** |
| | 7/20/2011 | -- | -- | <220 | **330,000** | **3,000** |
| | 10/18/2011 | -- | -- | <24 | **38,000** | **2,600** |
| KMW-2 | 4/16/2008 | <1.00 | <1.00 | <150 | <10.0 | -- |
| | 11/3/2010 | -- | -- | <220 | <3.6 | **2,000** |
| | 6/1/2011 | -- | -- | <220 | **13,000** | **12,000** |
| | 7/20/2011 | -- | -- | <220 | **1,200** | **51,000** |
| | 10/19/2011 | -- | -- | <24 | **17** | **70,000** |
| KMW-3 | 11/2/2010 | -- | -- | <220 | <3.6 | **1,900** |
| | 5/31/2011 | -- | -- | <220 | **12** | **2,300** |
| | 7/20/2011 | -- | -- | <220 | **8.6** | **2,000** |
| | 10/18/2011 | -- | -- | <24 | <3.6 | **2,100** |
| KMW-7 | 11/3/2010 | -- | -- | <220 | <3.6 | **2,100** |
| | 5/30/2011 | -- | -- | <220 | <3.6 | **2,300** |
| | 7/20/2011 | -- | -- | <220 | **23** | **2,200** |
| | 10/18/2011 | -- | -- | <24 | **23** | **2,200** |
| KMW-8 | 4/15/2008 | <1.00 | <1.00 | <150 | <10.0 | -- |
| DC-2 | 4/14/2008 | <1.00 | <1.00 | <150 | <10.0 | -- |
| | 11/3/2010 | -- | -- | <220 | <3.6 | **2,000** |
| | 5/31/2011 | -- | -- | <220 | **91** | **2,300** |
| | 7/21/2011 | -- | -- | <220 | **39** | **2,200** |
| | 10/18/2011 | -- | -- | **99** | **110** | **2,100** |

**Table 4**

*Dissolved Metals in Groundwater*
*In Situ Chemical Oxidation Pilot Study*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Dissolved Metals[1] (µg/L) | | | | |
|---|---|---|---|---|---|---|
| | | Arsenic | Chromium | Iron | Manganese | Potassium |
| DC-3 | 4/11/2008 | <1.00 | <1.00 | **292** | **24.3** | -- |
| | 11/3/2010 | -- | -- | <220 | <3.6 | **1,700** |
| | 5/30/2011 | -- | -- | **520** | **63** | **2,200** |
| | 7/20/2011 | -- | -- | <220 | **16** | **1,900** |
| | 10/18/2011 | -- | -- | **310** | **14** | **1,800** |
| DC-4 | 4/11/2008 | <1.00 | **1.03** | <150 | <10.0 | -- |
| | 11/3/2010 | -- | -- | <220 | <3.6 | **1,800** |
| | 5/31/2011 | -- | -- | <220 | **68,000** | **25,000** |
| | 7/20/2011 | -- | -- | <220 | **71,000** | **43,000** |
| | 10/18/2011 | -- | -- | <24 | **4.5** | **11,000** |
| DC-7 | 11/3/2010 | -- | -- | <220 | <3.6 | **2,200** |
| | 6/1/2011 | -- | -- | <220 | **190** | **2,100** |
| | 7/21/2011 | -- | -- | <220 | **47** | **2,200** |
| | 10/18/2011 | -- | -- | <24 | **82** | **2,500** |
| DC-8 | 4/16/2008 | <1.00 | <1.00 | <150 | <10.0 | -- |
| | 11/3/2010 | -- | -- | <220 | <3.6 | **1,400** |
| | 6/1/2011 | -- | -- | <220 | **110** | **1,500** |
| | 7/21/2011 | -- | -- | <220 | **64** | **1,500** |
| | 10/19/2011 | -- | -- | **24** | **84** | **1,500** |
| DC-9B | 4/15/2008 | <1.00 | <1.00 | <150 | <10.0 | -- |
| DC-10B | 11/3/2010 | -- | -- | <220 | <3.6 | **2,100** |
| | 5/30/2011 | -- | -- | <220 | **600,000** | **5,400** |
| | 7/19/2011 | -- | -- | <220 | **45,000** | **3,200** |
| | 10/18/2011 | -- | -- | <24 | **1,300** | **2,700** |
| DC-16 | 11/5/2010 | -- | -- | <220 | <3.6 | **2,000** |
| | 5/31/2011 | -- | -- | <220 | **13** | **2,400** |
| | 7/19/2011 | -- | -- | <220 | <3.6 | **2,100** |
| | 10/18/2011 | -- | -- | <24 | **10** | **2,200** |
| DC-17 | 11/3/2010 | -- | -- | <220 | <3.6 | **2,100** |
| | 5/30/2011 | -- | -- | <220 | **1,300** | **2,400** |
| | 7/19/2011 | -- | -- | <220 | **160** | **2,100** |
| | 10/18/2011 | -- | -- | <24 | **230** | **2,300** |

**Notes:**

**Bold** entries indicate positive analyte detections.

[1]By United States Environmental Protection Agency Methods 6010B and 6020

µg/L = Micrograms per liter

**--** = Not analyzed

**Table 5**

*Water Levels Observed During the Pilot Study*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Location | Date | Well Casing Elevation (feet amsl) | Depth to Water (feet below well casing) | Water Level Elevation (feet amsl) |
|---|---|---|---|---|
| MW-2 | 11/5/2010 | 309.97 | 37.03 | 272.94 |
| | 2/11/2011 | | 35.81 | 274.16 |
| | 5/30/2011 | | 34.40 | 275.57 |
| | 7/19/2011 | | 34.71 | 275.26 |
| | 10/17/2011 | | 35.80 | 274.17 |
| MW-3 | 11/5/2010 | 311.49 | 39.43 | 272.06 |
| | 2/11/2011 | | 38.10 | 273.39 |
| | 5/30/2011 | | 36.66 | 274.83 |
| | 7/19/2011 | | 37.03 | 274.46 |
| | 10/17/2011 | | 38.18 | 273.31 |
| MW-4 | 11/5/2010 | 310.54 | 38.74 | 271.80 |
| | 2/11/2011 | | 37.41 | 273.13 |
| | 5/30/2011 | | 35.99 | 274.55 |
| | 7/19/2011 | | 36.37 | 274.17 |
| | 10/17/2011 | | 37.50 | 273.04 |
| MW-5 | 11/5/2010 | 310.28 | 39.73 | 270.55 |
| | 2/11/2011 | | 38.60 | 271.68 |
| | 5/30/2011 | | 37.24 | 273.04 |
| | 7/19/2011 | | 37.51 | 272.77 |
| | 10/17/2011 | | 38.54 | 271.74 |
| MW-6 | 11/5/2010 | 304.27 | 37.25 | 267.02 |
| | 2/11/2011 | | 36.30 | 267.97 |
| | 5/30/2011 | | 35.50 | 268.77 |
| | 7/19/2011 | | 35.38 | 268.89 |
| | 10/17/2011 | | 36.24 | 268.03 |
| MW-7 | 11/5/2010 | 302.76 | 38.74 | 264.02 |
| | 2/11/2011 | | 37.61 | 265.15 |
| | 5/30/2011 | | 36.09 | 266.67 |
| | 7/19/2011 | | 36.43 | 266.33 |
| | 10/17/2011 | | 37.43 | 265.33 |
| MW-8 | 11/5/2010 | 280.08 | NM | - |
| | 2/11/2011 | | 11.11 | 268.97 |
| | 5/30/2011 | | 10.20 | 269.88 |
| | 7/19/2011 | | 10.66 | 269.42 |
| | 10/17/2011 | | 11.52 | 268.56 |
| MW-9 | 11/5/2010 | 285.11 | 31.98 | 253.13 |
| | 2/11/2011 | | 30.93 | 254.18 |
| | 5/30/2011 | | 29.76 | 255.35 |
| | 7/19/2011 | | 30.12 | 254.99 |
| | 10/17/2011 | | 31.04 | 254.07 |
| MW-10 | 2/11/2011 | 306.70 | 34.04 | 272.66 |
| | 5/30/2011 | | 32.69 | 274.01 |
| | 7/19/2011 | | 33.05 | 273.65 |
| | 10/17/2011 | | 34.13 | 272.57 |
| MW-11 | 2/11/2011 | 307.63 | 35.01 | 272.62 |
| | 5/30/2011 | | 33.63 | 274.00 |
| | 7/19/2011 | | 33.97 | 273.66 |
| | 10/17/2011 | | 35.05 | 272.58 |
| DC-1 | 11/5/2010 | 312.72 | 40.64 | 272.08 |
| | 2/11/2011 | | 39.37 | 273.35 |
| | 5/30/2011 | | 37.91 | 274.81 |
| | 7/19/2011 | | 38.21 | 274.51 |
| | 10/17/2011 | | 39.37 | 273.35 |

**Table 5**

*Water Levels Observed During the Pilot Study*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Location | Date | Well Casing Elevation (feet amsl) | Depth to Water (feet below well casing) | Water Level Elevation (feet amsl) |
|---|---|---|---|---|
| DC-2 | 11/5/2010 | 313.04 | 41.34 | 271.70 |
| | 2/11/2011 | | 40.08 | 272.96 |
| | 5/30/2011 | | 38.67 | 274.37 |
| | 7/19/2011 | | 38.98 | 274.06 |
| | 10/17/2011 | | 40.08 | 272.96 |
| DC-3 | 11/5/2010 | 313.23 | 41.58 | 271.65 |
| | 2/11/2011 | | 40.30 | 272.93 |
| | 5/30/2011 | | 38.89 | 274.34 |
| | 7/19/2011 | | 39.22 | 274.01 |
| | 10/17/2011 | | 40.34 | 272.89 |
| DC-4 | 11/5/2010 | 312.12 | 40.81 | 271.31 |
| | 2/11/2011 | | 39.51 | 272.61 |
| | 5/30/2011 | | 38.13 | 273.99 |
| | 7/19/2011 | | 38.48 | 273.64 |
| | 10/17/2011 | | 39.57 | 272.55 |
| DC-5 | 11/5/2010 | 306.10 | NM | - |
| | 2/11/2011 | | | |
| | 5/30/2011 | | | |
| | 7/19/2011 | | | |
| | 10/17/2011 | | | |
| DC-6 | 11/5/2010 | NM | NM | - |
| | 2/11/2011 | | | |
| | 5/30/2011 | | | |
| | 7/19/2011 | | | |
| | 10/17/2011 | | | |
| DC-7 | 11/5/2010 | 302.78 | 32.15 | 270.63 |
| | 2/11/2011 | | 30.91 | 271.87 |
| | 5/30/2011 | | 29.68 | 273.10 |
| | 7/19/2011 | | 30.03 | 272.75 |
| | 10/17/2011 | | 31.04 | 271.74 |
| DC-8 | 11/5/2010 | 306.38 | 35.69 | 270.69 |
| | 2/11/2011 | | 34.49 | 271.89 |
| | 5/30/2011 | | 33.15 | 273.23 |
| | 7/19/2011 | | 33.46 | 272.92 |
| | 10/17/2011 | | 34.51 | 271.87 |
| DC-9A | 11/5/2010 | 308.02 | NM | - |
| | 2/11/2011 | | | |
| | 5/30/2011 | | | |
| | 7/19/2011 | | | |
| | 10/17/2011 | | | |
| DC-9B | 11/5/2010 | 308.16 | NM[1] | - |
| | 2/11/2011 | | | |
| | 5/30/2011 | | | |
| | 7/19/2011 | | | |
| | 10/17/2011 | | | |
| DC-10A | 11/5/2010 | 304.08 | NM | - |
| | 2/11/2011 | | 34.99 | 269.09 |
| | 5/30/2011 | | 33.65 | 270.43 |
| | 7/19/2011 | | 34.07 | 270.01 |
| | 10/17/2011 | | 35.12 | 268.96 |
| DC-10B | 11/5/2010 | 307.89 | 36.40 | 271.49 |
| | 2/11/2011 | | 35.06 | 272.83 |
| | 5/30/2011 | | 33.72 | 274.17 |
| | 7/19/2011 | | 34.09 | 273.80 |
| | 10/17/2011 | | 35.15 | 272.74 |
| DC-11 | 11/5/2010 | 311.02 | 39.59 | 271.43 |
| | 2/11/2011 | | 38.36 | 272.66 |
| | 5/30/2011 | | 36.91 | 274.11 |
| | 7/19/2011 | | NM | - |
| | 10/17/2011 | | NM | - |

**Table 5**

*Water Levels Observed During the Pilot Study*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Location | Date | Well Casing Elevation (feet amsl) | Depth to Water (feet below well casing) | Water Level Elevation (feet amsl) |
|---|---|---|---|---|
| DC-12 | 11/5/2010 | 310.90 | 39.79 | 271.11 |
| | 2/11/2011 | | 38.60 | 272.30 |
| | 5/30/2011 | | 37.17 | 273.73 |
| | 7/19/2011 | | 37.45 | 273.45 |
| | 10/17/2011 | | 38.54 | 272.36 |
| DC-13 | 11/5/2010 | 310.85 | 38.88 | 271.97 |
| | 2/11/2011 | | 37.68 | 273.17 |
| | 5/30/2011 | | 36.28 | 274.57 |
| | 7/19/2011 | | 36.57 | 274.28 |
| | 10/17/2011 | | 37.65 | 273.20 |
| DC-14 | 11/5/2010 | 308.60 | 38.34 | 270.26 |
| | 2/11/2011 | | 37.18 | 271.42 |
| | 5/30/2011 | | 35.83 | 272.77 |
| | 7/19/2011 | | 36.12 | 272.48 |
| | 10/17/2011 | | 37.14 | 271.46 |
| DC-15 | 11/5/2010 | 307.54 | 36.93 | 270.61 |
| | 2/11/2011 | | 35.68 | 271.86 |
| | 5/30/2011 | | 34.32 | 273.22 |
| | 7/19/2011 | | 34.62 | 272.92 |
| | 10/17/2011 | | 35.68 | 271.86 |
| DC-16 | 11/5/2010 | 307.12 | 36.10 | 271.02 |
| | 2/11/2011 | | 34.85 | 272.27 |
| | 5/30/2011 | | 33.48 | 273.64 |
| | 7/19/2011 | | 33.83 | 273.29 |
| | 10/17/2011 | | 34.91 | 272.21 |
| DC-17 | 11/5/2010 | 304.89 | 34.86 | 270.03 |
| | 2/11/2011 | | 33.59 | 271.30 |
| | 5/30/2011 | | 32.23 | 272.66 |
| | 7/19/2011 | | 32.58 | 272.31 |
| | 10/17/2011 | | 33.65 | 271.24 |
| DC-18 | 11/5/2010 | NM | NM | - |
| | 2/11/2011 | | | |
| | 5/30/2011 | | | |
| | 7/19/2011 | | | |
| | 10/17/2011 | | | |
| DC-19 | 11/5/2010 | 313.53 | 41.75 | 271.78 |
| | 2/11/2011 | | 40.52 | 273.01 |
| | 5/30/2011 | | 39.06 | 274.47 |
| | 7/19/2011 | | 39.36 | 274.17 |
| | 10/17/2011 | | 40.47 | 273.06 |
| KMW-1 | 11/5/2010 | 311.21 | 40.37 | 270.84 |
| | 2/11/2011 | | 39.19 | 272.02 |
| | 5/30/2011 | | 37.79 | 273.42 |
| | 7/19/2011 | | 38.06 | 273.15 |
| | 10/17/2011 | | 39.13 | 272.08 |
| KMW-2 | 11/5/2010 | 306.90 | 35.65 | 271.25 |
| | 2/11/2011 | | 34.32 | 272.58 |
| | 5/30/2011 | | 32.96 | 273.94 |
| | 7/19/2011 | | 33.30 | 273.60 |
| | 10/17/2011 | | 34.39 | 272.51 |
| KMW-3 | 11/5/2010 | 296.92 | 26.37 | 270.55 |
| | 2/11/2011 | | NM[2] | - |
| | 5/30/2011 | | 24.22 | 272.70 |
| | 7/19/2011 | | 24.61 | 272.31 |
| | 10/17/2011 | | 25.58 | 271.34 |
| KMW-4 | 11/5/2010 | 299.45 | 28.22 | 271.23 |
| | 2/11/2011 | | 26.87 | 272.58 |
| | 5/30/2011 | | 25.59 | 273.86 |
| | 7/19/2011 | | 25.99 | 273.46 |
| | 10/17/2011 | | 27.07 | 272.38 |

**Table 5**

*Water Levels Observed During the Pilot Study*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Location | Date | Well Casing Elevation (feet amsl) | Depth to Water (feet below well casing) | Water Level Elevation (feet amsl) |
|---|---|---|---|---|
| KMW-5 | 11/5/2010 | 297.10 | 26.49 | 270.61 |
| | 2/11/2011 | | 25.21 | 271.89 |
| | 5/30/2011 | | 24.00 | 273.10 |
| | 7/19/2011 | | 24.41 | 272.69 |
| | 10/17/2011 | | 25.41 | 271.69 |
| KMW-5D | 11/5/2010 | 296.94 | 26.35 | 270.59 |
| | 2/11/2011 | | 25.10 | 271.84 |
| | 5/30/2011 | | 23.89 | 273.05 |
| | 7/19/2011 | | 24.28 | 272.66 |
| | 10/17/2011 | | 25.28 | 271.66 |
| KMW-6 | 11/5/2010 | 294.70 | 24.51 | 270.19 |
| | 2/11/2011 | | 23.26 | 271.44 |
| | 5/30/2011 | | 22.12 | 272.58 |
| | 7/19/2011 | | 22.52 | 272.18 |
| | 10/17/2011 | | 23.48 | 271.22 |
| KMW-7 | 11/5/2010 | 301.32 | 31.36 | 269.96 |
| | 2/11/2011 | | 30.14 | 271.18 |
| | 5/30/2011 | | 28.92 | 272.40 |
| | 7/19/2011 | | 29.27 | 272.05 |
| | 10/17/2011 | | 30.25 | 271.07 |
| KMW-8 | 11/5/2010 | 308.08 | 37.87 | 270.21 |
| | 2/11/2011 | | 36.72 | 271.36 |
| | 5/30/2011 | | 35.40 | 272.68 |
| | 7/19/2011 | | 35.68 | 272.40 |
| | 10/17/2011 | | 36.71 | 271.37 |
| KMW-9 | 11/5/2010 | 310.18 | 38.78 | 271.40 |
| | 2/11/2011 | | 37.51 | 272.67 |
| | 5/30/2011 | | 36.11 | 274.07 |
| | 7/19/2011 | | 36.49 | 273.69 |
| | 10/17/2011 | | 37.51 | 272.67 |

**Notes:**

amsl = Above mean sea level
NM (not measured) = The monitoring well could not be located.
NM[1] = The monitoring well was discovered to have been destroyed by tampering.
NM[2] = The monitoring well was obstructed by a parked vehicle.

**Table 6**

*Injection Volume*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Injection Point | Injection Volume (Gallons) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 4/19/2011 | 4/20/2011 | 4/21/2011 | 4/22/2011 | 4/25/2011 | 4/26/2011 | 4/27/2011 | 4/28/2011 | 4/29/2011 | Total Volume |
| IP-1 | 1,135 | 665 | - | - | - | - | - | - | - | 1,800 |
| IP-2 | 1,338 | 462 | - | - | - | - | - | - | - | 1,800 |
| IP-3 | 161 | 391 | 429 | 213 | 115 | 528 | - | - | - | 1,837 |
| IP-4 | 0 | 621 | 1,189 | - | - | - | - | - | - | 1,810 |
| IP-5 | 930 | 870 | - | - | - | - | - | - | - | 1,800 |
| IP-6 | 208 | 253 | 474 | 652 | 226 | - | - | - | - | 1,813 |
| IW-1 | - | - | - | - | - | 3 | - | - | 2,377 | 2,380 |
| IP-8 | - | 229 | 257 | 448 | 203 | 663 | - | - | - | 1,800 |
| IP-9 | - | 87 | 999 | 769 | - | - | - | - | - | 1,855 |
| IP-10 | - | - | 18 | 3 | - | - | 5 | 1,779 | - | 1,805 |
| IP-11 | - | - | - | 57 | 1,743 | - | - | - | - | 1,800 |
| IP-12 | - | - | - | 161 | 400 | 1,239 | - | - | - | 1,800 |
| IP-13 | - | - | - | - | - | 177 | 166 | 986 | 471 | 1,800 |
| IP-14 | - | - | - | - | - | 77 | 1,723 | - | - | 1,800 |
| IP-15 | - | - | - | - | - | - | 1,800 | - | - | 1,800 |
| **Total** | **3,772** | **3,578** | **3,366** | **2,303** | **2,687** | **2,687** | **3,694** | **2,765** | **2,848** | **27,700** |

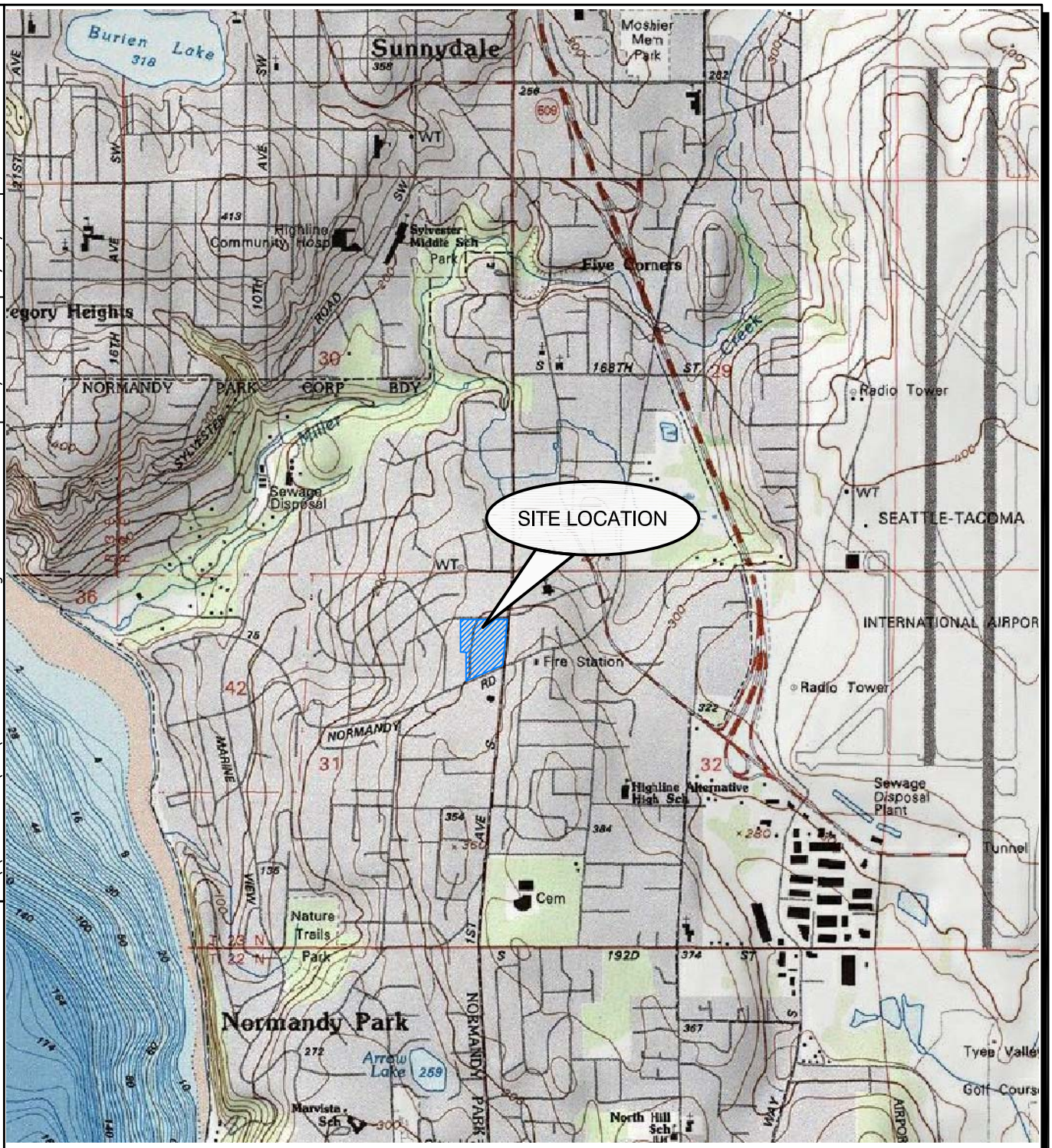
*Figures*

Project No. 0075720.00

Date: 11/17/08

Drawn By: R.O./C.T.

CAD File: F:\0075720\00\007572000-17.dwg




SCALE 1: 24,000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

N

References:
TOPO!® Software
U.S.G.S. 7.5 Minute Series (Topographic) Quadrangle, Des Moines, WA
Version: 1995; Current: 1990

Figure 1
*Site Location Map*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM *11/08*

Project No. 0123986.02
Date: 11/30/11
Drawn By: R. Olson
CAD File: G:\0123986\02\0123986020398602-03.dwg

SW 178th STREET
1st AVE SOUTH
2nd AVE SW

HARRIS PROPERTY
MANHATTAN VILLAGE SHOPPING CENTER

KMW-6 KMW-7 KMW-8 KMW-3 KMW-5 KMW-4 KMW-2 KMW-1 KMW-9
DC-14 DC-8 DC-7 DC-15 DC-18 DC-13 DC-12 DC-16 DC-17 DC-6 DC-10B DC-10A DC-9A DC-11 DC-4 DC-3 DC-2 DC-19 DC-1
MW-5 MW-2 MW-1 MW-10(1) MW-11(2) MW-4 MW-3
SB-2 SB-1 SB-3
IP-1 IP-2 IP-3 IP-4 IP-5 IP-6 IP-7 IW-1 IP-8 IP-14 IP-13 IP-15 IP-12 IP-11 IP-9 IP-10

RESIDENCE
RESIDENCE
COMMERCIAL BUILDING
VACANT SHED
FORMER SEPTIC TANK
PHONE BOOTH
FORMER LAUNDROMAT/ DRY CLEANER
SIGN
CONDOMINIUMS
RETAINING WALL
DAIRY QUEEN
SECOND BUILDING (VARIOUS SHOPS)
FOUR STAR DRY CLEANERS
PARKING LOT
BUILDING
QFC BUILDING
SUSPECTED SEPTIC TANK

N
1" = 75'
0 75' 150'

LEGEND
- Performance Monitoring Well
- Monitoring Well
- Soil Boring
- Injection Point
- Approximate Harris Property Boundary
- Approximate Manhattan Village Shopping Center Property Boundary
- E — Underground Electrical Utility
- G — Underground Natural Gas Utility
- SS — Underground Sewer Utility
- SD — Underground Storm Drain Utility
- W — Underground Water Utility

Notes:
(1) MW-10 is a replacement for the historic DC-5 installed in February 2011.
(2) MW-11 is a replacement for the historic DC-9B installed in February 2011.

Figure 2
*Injection Locations and Performance Monitoring Well Network*
*ISCO Pilot Study*
*MVSC/Harris Properties*
*Normandy Park, WA*
ERM 11/11

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| G:\\0123986\01\012398601-08.dwg | R. Olson | 11/30/11 | 0123986.01 |

N

RESIDENCES

DUNN LUMBER

DUNN LUMBER

MW-6 NS

SW 178th STREET

KMW-6 NS

KMW-3

| | |
|---|---|
| 11/2/10 | **11** |
| 4/28/11* | NA |
| 5/31/11 | **6.2** |
| 7/20/11 | **12** |
| 10/18/11 | **11** |

KMW-7

| | |
|---|---|
| 11/3/10 | <2.0 |
| 4/28/11* | NA |
| 5/30/11 | 2.3 |
| 7/20/11 | <2.0 |
| 10/18/11 | <2.0 |

KMW-8 NS

DC-14 NS

HARRIS PROPERTY

MW-5 NS

DC-8

| | |
|---|---|
| 11/3/10 | **25** |
| 4/28/11* | NA |
| 6/1/11 | **11** |
| 7/21/11 | **25** |
| 10/19/11 | **26** |

DC-7

| | |
|---|---|
| 11/3/10 | **34** |
| 4/28/11* | NA |
| 6/1/11 | **15** |
| 7/21/11 | **38** |
| 10/19/11 | **42** |

KMW-5D NS

KMW-5 NS

2nd AVE SW

RESIDENCE

DC-15 NS

COMMERCIAL BUILDING

DC-17

| | |
|---|---|
| 11/3/10 | 2.1 |
| 4/28/11* | NA |
| 5/30/11 | <2.0 |
| 7/19/11 | <2.0 |
| 10/18/11 | <2.0 |

KMW-1 NS

VACANT SHED

DC-16

| | |
|---|---|
| 11/5/10 | <2.0 |
| 4/28/11* | NA |
| 5/31/11 | <2.0 |
| 7/19/11 | <2.0 |
| 10/18/11 | <2.0 |

DC-18 NS

DC-13 NS

KMW-2

| | |
|---|---|
| 11/3/10 | **74** |
| 4/28/11* | NA |
| 6/1/11 | **12** |
| 7/20/11 | **44** |
| 10/19/11 | **40** |

MW-10

| | |
|---|---|
| 2/8/10 | **10** |
| 4/28/11* | NA |
| 5/31/11 | <2.0 |
| 7/20/11 | 4.1 |
| 10/18/11 | 4.9 |

DC-12 NS

FORMER SEPTIC TANK

PHONE BOOTH

KMW-4 NS

DC-10B

| | |
|---|---|
| 11/3/10 | 2.6 |
| 4/28/11* | NA |
| 5/30/11 | <2.0 |
| 7/19/11 | <2.0 |
| 10/18/11 | <2.0 |

DC-6 NS

MW-2 NS

MW-1 NS

FORMER LAUNDROMAT/ DRY CLEANER

DC-9A NS

MW-11

| | |
|---|---|
| 2/8/10 | **47** |
| 4/28/11* | NA |
| 5/31/11 | <2.0 |
| 7/20/11 | <2.0 |
| 10/18/11 | <2.0 |

DC-10A NS

CONDOMINIUMS

IP-7

IW-1

IP-2

IP-3

IP-5

IP-6

IP-1

IP-4

KMW-9 NS

DC-11 NS

SIGN

1st AVE SOUTH

DC-4

| | |
|---|---|
| 11/3/10 | **13** |
| 4/28/11* | NA |
| 5/31/11 | <2.0 |
| 7/20/11 | <2.0 |
| 10/18/11 | **22** |

PARKING LOT

IP-8

IP-14

IP-13

IP-15

IP-12

IP-11

IP-9

IP-10

DC-3

| | |
|---|---|
| 11/3/10 | <2.0 |
| 4/28/11* | NA |
| 5/30/11 | 3.9 |
| 7/20/11 | **12** |
| 10/18/11 | **6.7** |

DC-2

| | |
|---|---|
| 11/3/10 | <2.0 |
| 4/28/11* | NA |
| 5/31/11 | <2.0 |
| 7/21/11 | <2.0 |
| 10/18/11 | <2.0 |

RETAINING WALL

DC-19 NS

DAIRY QUEEN

SECOND BUILDING (VARIOUS SHOPS)

FOUR STAR DRY CLEANERS

DC-1 NS

MW-4

| | |
|---|---|
| 11/1/10 | **16** |
| 4/28/11* | NA |
| 5/31/11 | **10** |
| 7/21/11 | **25** |
| 10/19/11 | **21** |

MANHATTAN VILLAGE SHOPPING CENTER

BUILDING

MW-3

| | |
|---|---|
| 11/1/10 | 2.9 |
| 4/28/11* | NA |
| 5/31/11 | <2.0 |
| 7/20/11 | <2.0 |
| 10/18/11 | **6.1** |

SUSPECTED SEPTIC TANK

QFC BUILDING

0 40' 80' 160'

1" = 80'

Approximate Harris Property Boundary

Approximate Manhattan Village Shopping Center Property Boundary

Underground Electrical Utility

Underground Natural Gas Utility

Underground Sewer Utility

Underground Storm Drain Utility

Underground Water Utility

LEGEND

Monitoring Well

Shallow Monitoring Well

Deep Monitoring Well

Injection Point

11/3/10 | 2.1 — Date Sample Collected; Tetrachloroethene (PCE) Concentration (µg/L)

**Bolded** results are greater than the Model Toxics Control Act (MTCA) Method A Groundwater Level

NS Not Sampled

NA No Analytical Samples Collected

µg/L Micrograms Per Liter

Dark purple in the results column represents the observation of dark purple potassium permanganate in groundwater purged from the well during the sampling event. The same applies to medium and light purple.

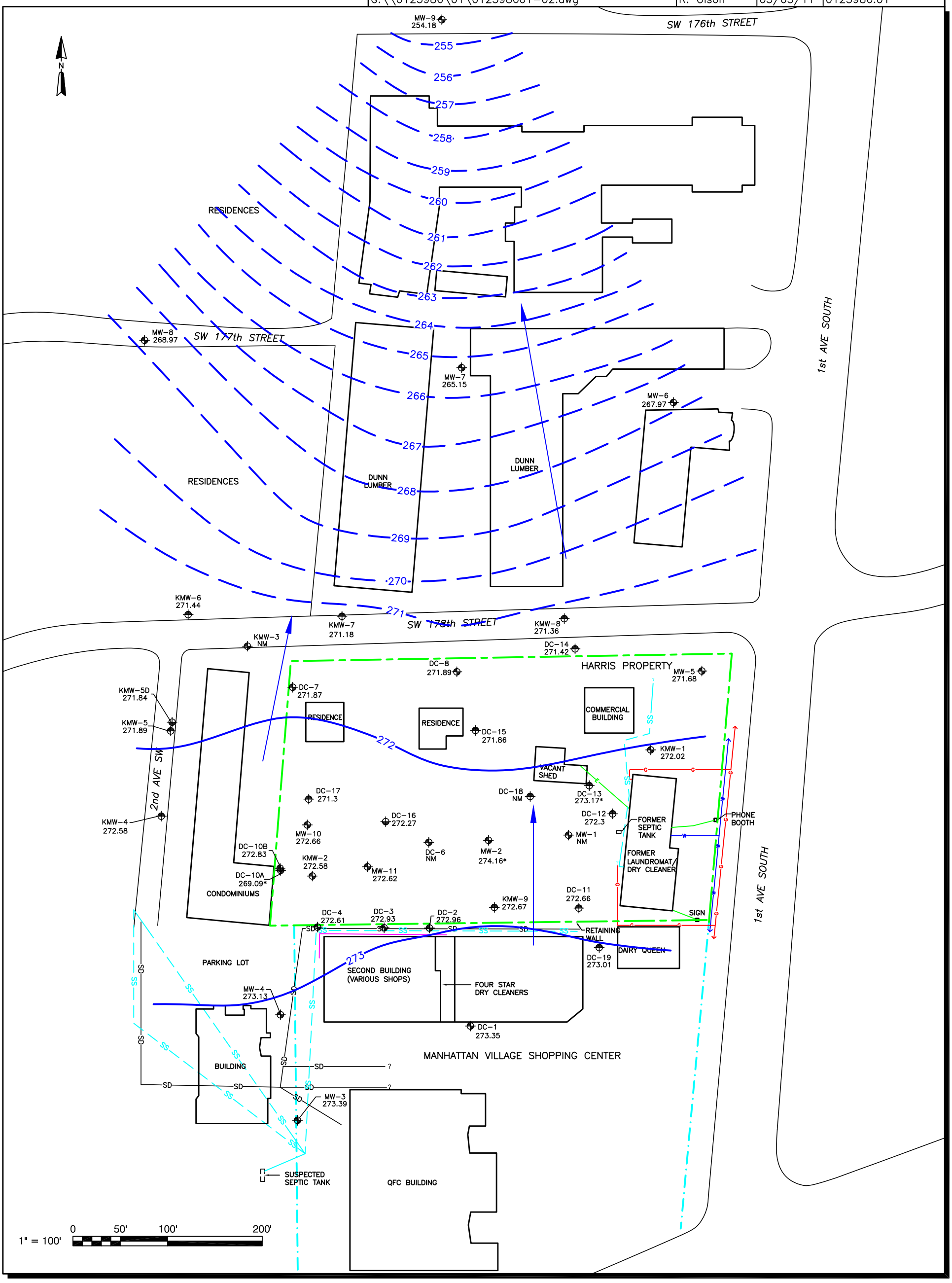
*Color observations represent conditions immediately following the completion of the injection phase of the pilot study. No groundwater samples were submitted for analysis at this time.

Figure 3

*Potassium Permanganate Pilot Study*
*PCE in Groundwater, Pilot Study Baseline and Progress Monitoring Events*
*MSSC/Harris Properties*
*Normandy Park, Washington*

ERM 11/11

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| G:\\0123986\01\012398601-02.dwg | R. Olson | 03/03/11 | 0123986.01 |




LEGEND

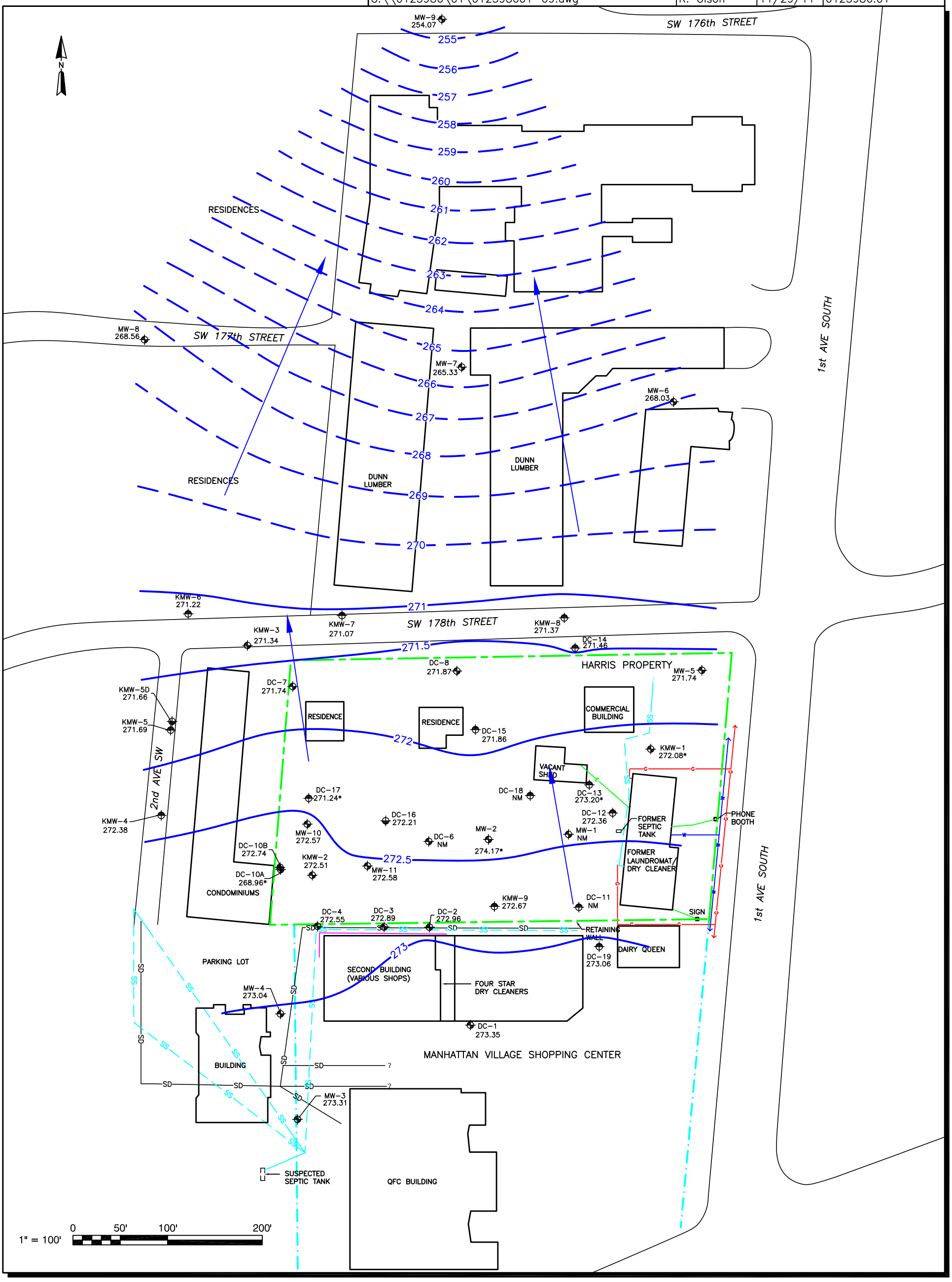
| | |
|---|---|
| ⊕ | Monitoring Well |
| ⊕ | Shallow Monitoring Well |
| ⊕ | Deep Monitoring Well |
| 271.18 | Groundwater Elevation (Feet Above Mean Seal Level), Measured on 11 February 2011 |
| — - 271.00 — | Potentiometric Surface Elevation (Feet Above Mean Sea Level); Dashed Where Inferred |
| NM | Not Measured |
| * | Water Level Anomalous, Not Used to Evaluate Groundwater Flow |
| → | Inferred Groundwater Flow Direction |
| | Approximate Harris Property Boundary |
| | Approximate Manhattan Village Shopping Center Property Boundary |
| E | Underground Electrical Utility |
| G | Underground Natural Gas Utility |
| SS | Underground Sewer Utility |
| SD | Underground Storm Drain Utility |
| W | Underground Water Utility |

Figure 4

*Potentiometric Surface Map*
*February 2011*
*ISCO Pilot Study*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM 03/11

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| G:\\0123986\01\012398601-09.dwg | R. Olson | 11/29/11 | 0123986.01 |




LEGEND

| | |
|---|---|
| ⊕ | Monitoring Well |
| ⊕ | Shallow Monitoring Well |
| ⊕ | Deep Monitoring Well |
| 271.07 | Groundwater Elevation (Feet Above Mean Seal Level), Measured on 17 October 2011 |
| — - 271.00 — | Potentiometric Surface Elevation (Feet Above Mean Sea Level); Dashed Where Inferred |
| NM | Not Measured |
| * | Water Level Anomalous, Not Used to Evaluate Groundwater Flow |
| → | Inferred Groundwater Flow Direction |
| | Approximate Harris Property Boundary |
| | Approximate Manhattan Village Shopping Center Property Boundary |
| E | Underground Electrical Utility |
| G | Underground Natural Gas Utility |
| SS | Underground Sewer Utility |
| SD | Underground Storm Drain Utility |
| W | Underground Water Utility |

Figure 5

*Potentiometric Surface Map*
*October 2011*
*ISCO Pilot Study*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM 11/11

*Attachment A*
*Laboratory Analytical Results*

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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-01 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/1/2010 11:06 |
| CLIENT SAMPLE ID | MW-4-110110 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **16** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-01 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/1/2010 11:06 |
| CLIENT SAMPLE ID | MW-4-110110 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2300** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **107** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **93.4** | 11/08/2010 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-02 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/1/2010 13:46 |
| CLIENT SAMPLE ID | MW-3-110110 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **2.9** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/1/2010 13:46 |
| CLIENT SAMPLE ID | MW-3-110110 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2000** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **108** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **93.6** | 11/08/2010 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/1/2010 15:35 |
| CLIENT SAMPLE ID | DC-11-110110 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **4.8** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/1/2010 15:35 |
| CLIENT SAMPLE ID | DC-11-110110 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **109** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **92.9** | 11/08/2010 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/2/2010 17:13 |
| CLIENT SAMPLE ID | KMW-3-110210 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **11** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-04 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/2/2010 17:13 |
| CLIENT SAMPLE ID | KMW-3-110210 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **1900** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **108** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **92.8** | 11/08/2010 | GAP |

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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-05 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/2/2010 16:05 |
| CLIENT SAMPLE ID | DC-13-110210 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **9.2** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-05 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/2/2010 16:05 |
| CLIENT SAMPLE ID | DC-13-110210 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **110** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **91.5** | 11/08/2010 | GAP |

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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-06 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 09:18 |
| CLIENT SAMPLE ID | DC-2-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-06 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 09:18 |
| CLIENT SAMPLE ID | DC-2-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2000** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **110** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **92.2** | 11/08/2010 | GAP |

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| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 08:29 |
| CLIENT SAMPLE ID | DC-3-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-07 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 08:29 |
| CLIENT SAMPLE ID | DC-3-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **1700** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **110** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **93.7** | 11/08/2010 | GAP |

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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-08 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 07:28 |
| CLIENT SAMPLE ID | DC-4-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **13** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-08 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 07:28 |
| CLIENT SAMPLE ID | DC-4-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **1800** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **111** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **93.2** | 11/08/2010 | GAP |

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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-09 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 10:12 |
| CLIENT SAMPLE ID | KMW-7-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-09 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 10:12 |
| CLIENT SAMPLE ID | KMW-7-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2100** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **111** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **92.9** | 11/08/2010 | GAP |

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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-10 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/2/2010 10:50 |
| CLIENT SAMPLE ID | DC-7-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **34** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-10 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/2/2010 10:50 |
| CLIENT SAMPLE ID | DC-7-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2200** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **110** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **92.2** | 11/08/2010 | GAP |

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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-11 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 12:00 |
| CLIENT SAMPLE ID | DC-8-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **25** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-11 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 12:00 |
| CLIENT SAMPLE ID | DC-8-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **1400** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **110** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **93.2** | 11/08/2010 | GAP |

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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-12 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 13:15 |
| CLIENT SAMPLE ID | KMW-2-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **74** | 8.0 | 4 | UG/L | 11/10/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-12 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 13:15 |
| CLIENT SAMPLE ID | KMW-2-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2000** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **111** | 11/08/2010 | GAP |
| 1,2-Dichloroethane-d4 4X Dilution | EPA-8260 | **106** | 11/10/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **94.5** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene 4X Dilution | EPA-8260 | **91.0** | 11/10/2010 | GAP |

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| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 15:11 |
| CLIENT SAMPLE ID | DC-10B-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **2.6** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-13 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 15:11 |
| CLIENT SAMPLE ID | DC-10B-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2100** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **111** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **92.7** | 11/08/2010 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-14 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 16:48 |
| CLIENT SAMPLE ID | DC-17-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **2.1** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-14 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/3/2010 16:48 |
| CLIENT SAMPLE ID | DC-17-110310 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | **2100** | 20 | 1 | UG/L | 11/09/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **111** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **93.8** | 11/08/2010 | GAP |

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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-15 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | |
| CLIENT SAMPLE ID | KMW-9-11/04 09:44 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/08/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | **2.8** | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/08/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |



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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/10/2010<br>1011034<br>-15 |
| CLIENT CONTACT: | Mike Mendes | DATE RECEIVED: | 11/4/2010 |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | COLLECTION DATE: | |
| CLIENT SAMPLE ID | KMW-9-11/04 09:44 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/08/2010 | GAP |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **110** | 11/08/2010 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **94.4** | 11/08/2010 | GAP |

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| | | ALS JOB#: | 1011034 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Mendes | | |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | | |

## LABORATORY BLANK RESULTS

**MB-110510W**

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/05/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/05/2010 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |



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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE: | 11/10/2010 |
| | | ALS JOB#: | 1011034 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Mendes | | |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | | |

## LABORATORY BLANK RESULTS

**MB-110510W**

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |

**MB-110510W**

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Iron | EPA-6020 | U | 220 | 1 | UG/L | 11/09/2010 | RAL |
| Manganese | EPA-6020 | U | 3.6 | 1 | UG/L | 11/09/2010 | RAL |
| Potassium | EPA-6020 | U | 20 | 1 | UG/L | 11/09/2010 | RAL |



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| | | ALS JOB#: | 1011034 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Mendes | | |
| CLIENT PROJECT: | 114726 / Normandy Park Baseline GW Sampling | | |

## LABORATORY CONTROL SAMPLE RESULTS

### ALS Test Batch ID: 1220 - Water by EPA-8260

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| 1,1-Dichloroethene - BS | EPA-8260 | **113** | | | 11/05/2010 | GAP |
| 1,1-Dichloroethene - BSD | EPA-8260 | **110** | **3** | | 11/05/2010 | GAP |
| Trichloroethene - BS | EPA-8260 | **114** | | | 11/05/2010 | GAP |
| Trichloroethene - BSD | EPA-8260 | **114** | **0** | | 11/05/2010 | GAP |
| Toluene - BS | EPA-8260 | **115** | | | 11/05/2010 | GAP |
| Toluene - BSD | EPA-8260 | **115** | **0** | | 11/05/2010 | GAP |
| Chlorobenzene - BS | EPA-8260 | **118** | | | 11/05/2010 | GAP |
| Chlorobenzene - BSD | EPA-8260 | **118** | **0** | | 11/05/2010 | GAP |

### ALS Test Batch ID: 1222 - Water by EPA-6020

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| Iron - BS | EPA-6020 | **99.2** | | | 11/09/2010 | RAL |
| Iron - BSD | EPA-6020 | **99.8** | **0** | | 11/09/2010 | RAL |
| Manganese - BS | EPA-6020 | **95.8** | | | 11/09/2010 | RAL |
| Manganese - BSD | EPA-6020 | **97.2** | **1** | | 11/09/2010 | RAL |
| Potassium - BS | EPA-6020 | **91.0** | | | 11/09/2010 | RAL |
| Potassium - BSD | EPA-6020 | **93.9** | **3** | | 11/09/2010 | RAL |

APPROVED BY:

Laboratory Director



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/17/2010<br>1011043<br>-01 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 11/8/2010 |
| CLIENT PROJECT: | Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/5/2010 15:00 |
| CLIENT SAMPLE ID | DC-16-110510 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/10/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 11/10/2010 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/10/2010 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 11/10/2010 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 11/10/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 11/10/2010 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 11/10/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/10/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

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|---|---|---|---|
| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/17/2010<br>1011043<br>-01 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 11/8/2010 |
| CLIENT PROJECT: | Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/5/2010 15:00 |
| CLIENT SAMPLE ID | DC-16-110510 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 11/10/2010 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/10/2010 | GAP |
| Iron | EPA-6020 (Dissolved) | U | 220 | 1 | UG/L | 11/16/2010 | RAL |
| Manganese | EPA-6020 (Dissolved) | U | 3.6 | 1 | UG/L | 11/16/2010 | RAL |
| Potassium | EPA-6020 (Dissolved) | **2000** | 20 | 1 | UG/L | 11/16/2010 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **107** | 11/10/2010 | GAP |
| Toluene-d8 | EPA-8260 | **96.4** | 11/10/2010 | GAP |



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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 11/8/2010 |
| CLIENT PROJECT: | Normandy Park Baseline GW Sampling | COLLECTION DATE: | 11/5/2010 15:00 |
| CLIENT SAMPLE ID | DC-16-110510 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 4-Bromofluorobenzene | EPA-8260 | **91.2** | 11/10/2010 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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CLIENT: ERM West
915 118th Ave. SE, Suite 130
Bellevue, WA 98005

DATE: 11/17/2010
ALS JOB#: 1011043
WDOE ACCREDITATION: C601

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT: Normandy Park Baseline GW Sampling

## LABORATORY BLANK RESULTS

**MB-110510W**

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 11/05/2010 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 11/05/2010 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 11/05/2010 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 11/05/2010 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 11/05/2010 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 11/05/2010 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 11/05/2010 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 11/05/2010 | GAP |



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## CERTIFICATE OF ANALYSIS

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| CLIENT: | ERM West<br>915 118th Ave. SE, Suite 130<br>Bellevue, WA 98005 | DATE: | 11/17/2010 |
| | | ALS JOB#: | 1011043 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Arnold | | |
| CLIENT PROJECT: | Normandy Park Baseline GW Sampling | | |

## LABORATORY BLANK RESULTS

### MB-110510W

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 11/05/2010 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 11/05/2010 | GAP |

### MB-111510W

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Iron | EPA-6020 (Dissolved) | U | 220 | 1 | UG/L | 11/16/2010 | RAL |
| Manganese | EPA-6020 (Dissolved) | U | 3.6 | 1 | UG/L | 11/16/2010 | RAL |
| Potassium | EPA-6020 (Dissolved) | U | 20 | 1 | UG/L | 11/16/2010 | RAL |



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| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Arnold | | |
| CLIENT PROJECT: | Normandy Park Baseline GW Sampling | | |

## LABORATORY BLANK RESULTS

**MB-111510W**

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|



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| | | ALS JOB#: | 1011043 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Arnold | | |
| CLIENT PROJECT: | Normandy Park Baseline GW Sampling | | |

## LABORATORY CONTROL SAMPLE RESULTS

### ALS Test Batch ID: 1220 - Water by EPA-8260

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| 1,1-Dichloroethene - BS | EPA-8260 | **113** | | | 11/05/2010 | GAP |
| 1,1-Dichloroethene - BSD | EPA-8260 | **110** | **3** | | 11/05/2010 | GAP |
| Benzene - BS | EPA-8260 | **116** | | | 11/05/2010 | GAP |
| Benzene - BSD | EPA-8260 | **115** | **0** | | 11/05/2010 | GAP |
| Trichloroethene - BS | EPA-8260 | **114** | | | 11/05/2010 | GAP |
| Trichloroethene - BSD | EPA-8260 | **114** | **0** | | 11/05/2010 | GAP |
| Toluene - BS | EPA-8260 | **115** | | | 11/05/2010 | GAP |
| Toluene - BSD | EPA-8260 | **115** | **0** | | 11/05/2010 | GAP |
| Chlorobenzene - BS | EPA-8260 | **118** | | | 11/05/2010 | GAP |
| Chlorobenzene - BSD | EPA-8260 | **118** | **0** | | 11/05/2010 | GAP |

### ALS Test Batch ID: 1239 - Water by EPA-6020

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| Iron - BS | EPA-6020 (Dissolved) | **95.5** | | | 11/16/2010 | RAL |
| Iron - BSD | EPA-6020 (Dissolved) | **96.4** | **0** | | 11/16/2010 | RAL |
| Manganese - BS | EPA-6020 (Dissolved) | **94.4** | | | 11/16/2010 | RAL |
| Manganese - BSD | EPA-6020 (Dissolved) | **94.4** | **0** | | 11/16/2010 | RAL |
| Potassium - BS | EPA-6020 (Dissolved) | **90.4** | | | 11/16/2010 | RAL |
| Potassium - BSD | EPA-6020 (Dissolved) | **90.6** | **0** | | 11/16/2010 | RAL |

APPROVED BY:

Laboratory Director



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 6/10/2011 |
| | | ALS JOB#: | 1106014 |
| | | ALS SAMPLE#: | -01 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/30/2011 12:15 |
| CLIENT SAMPLE ID | KMW-7-053011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/02/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **2.3** | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/02/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-01 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/30/2011 12:15 |
| CLIENT SAMPLE ID | KMW-7-053011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/02/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/07/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | U | 3.6 | 1 | UG/L | 06/07/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2300** | 53 | 1 | UG/L | 06/07/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **95.9** | 06/02/2011 | GAP |
| Toluene-d8 | EPA-8260 | **95.4** | 06/02/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **98.6** | 06/02/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-02 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 14:46 |
| CLIENT SAMPLE ID | DC-2-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/02/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/02/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-02 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 14:46 |
| CLIENT SAMPLE ID | DC-2-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/02/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/07/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **91** | 3.6 | 1 | UG/L | 06/07/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2300** | 53 | 1 | UG/L | 06/07/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **96.1** | 06/02/2011 | GAP |
| Toluene-d8 | EPA-8260 | **95.5** | 06/02/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **99.4** | 06/02/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-03 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/30/2011 14:54 |
| CLIENT SAMPLE ID | DC-3-053011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/02/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **3.9** | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/02/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-03 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/30/2011 14:54 |
| CLIENT SAMPLE ID | DC-3-053011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/02/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | **520** | 220 | 1 | UG/L | 06/07/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **63** | 3.6 | 1 | UG/L | 06/07/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2200** | 53 | 1 | UG/L | 06/07/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **95.3** | 06/02/2011 | GAP |
| Toluene-d8 | EPA-8260 | **97.2** | 06/02/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **98.3** | 06/02/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-04 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 19:40 |
| CLIENT SAMPLE ID | DC-16-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/02/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/02/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 19:40 |
| CLIENT SAMPLE ID | DC-16-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/02/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/07/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **13** | 3.6 | 1 | UG/L | 06/07/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2400** | 53 | 1 | UG/L | 06/07/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **97.0** | 06/02/2011 | GAP |
| Toluene-d8 | EPA-8260 | **95.2** | 06/02/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **101** | 06/02/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-05 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/30/2011 16:22 |
| CLIENT SAMPLE ID | DC-17-053011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/02/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/02/2011 | GAP |



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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/30/2011 16:22 |
| CLIENT SAMPLE ID | DC-17-053011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/02/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/07/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **1300** | 3.6 | 1 | UG/L | 06/07/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2400** | 53 | 1 | UG/L | 06/07/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **95.5** | 06/02/2011 | GAP |
| Toluene-d8 | EPA-8260 | **96.1** | 06/02/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **101** | 06/02/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-06 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/30/2011 17:38 |
| CLIENT SAMPLE ID | DC-10B-053011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/02/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acetone | EPA-8260 | **290** | 25 | 20 | UG/L | 06/09/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/02/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-06 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/30/2011 17:38 |
| CLIENT SAMPLE ID | DC-10B-053011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/02/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/08/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **600000** | 360 | 100 | UG/L | 06/09/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **5400** | 53 | 1 | UG/L | 06/08/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **95.5** | 06/02/2011 | GAP |
| 1,2-Dichloroethane-d4 20X Dilution | EPA-8260 | **98.3** | 06/09/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.4** | 06/02/2011 | GAP |
| Toluene-d8 20X Dilution | EPA-8260 | **88.7** | 06/09/2011 | GAP |



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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/30/2011 17:38 |
| CLIENT SAMPLE ID | DC-10B-053011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 4-Bromofluorobenzene | EPA-8260 | **101** | 06/02/2011 | GAP |
| 4-Bromofluorobenzene 20X Dilution | EPA-8260 | **95.0** | 06/09/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 6/10/2011 |
| | | ALS JOB#: | 1106014 |
| | | ALS SAMPLE#: | -07 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 10:30 |
| CLIENT SAMPLE ID | MW-3-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/02/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/02/2011 | GAP |



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| | | ALS JOB#: | 1106014 |
| | | ALS SAMPLE#: | -07 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 10:30 |
| CLIENT SAMPLE ID | MW-3-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/02/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/07/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **86** | 3.6 | 1 | UG/L | 06/07/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2200** | 53 | 1 | UG/L | 06/07/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **95.3** | 06/02/2011 | GAP |
| Toluene-d8 | EPA-8260 | **95.1** | 06/02/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **101** | 06/02/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-08 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 11:25 |
| CLIENT SAMPLE ID | MW-10-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/02/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/02/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-08 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 11:25 |
| CLIENT SAMPLE ID | MW-10-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/02/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/07/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **39** | 3.6 | 1 | UG/L | 06/07/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2400** | 53 | 1 | UG/L | 06/07/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **96.2** | 06/02/2011 | GAP |
| Toluene-d8 | EPA-8260 | **95.3** | 06/02/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **100** | 06/02/2011 | GAP |

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## CERTIFICATE OF ANALYSIS

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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-09 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 12:15 |
| CLIENT SAMPLE ID | KMW-3-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/02/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **6.2** | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/02/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 12:15 |
| CLIENT SAMPLE ID | KMW-3-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/02/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/07/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **12** | 3.6 | 1 | UG/L | 06/07/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2300** | 53 | 1 | UG/L | 06/07/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **94.0** | 06/02/2011 | GAP |
| Toluene-d8 | EPA-8260 | **96.0** | 06/02/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **100** | 06/02/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 13:19 |
| CLIENT SAMPLE ID | DC-4-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/02/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acetone | EPA-8260 | **46** | 25 | 4 | UG/L | 06/09/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/02/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-10 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 13:19 |
| CLIENT SAMPLE ID | DC-4-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/02/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/08/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **68000** | 71 | 20 | UG/L | 06/09/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **25000** | 53 | 1 | UG/L | 06/08/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **96.8** | 06/02/2011 | GAP |
| 1,2-Dichloroethane-d4 4X Dilution | EPA-8260 | **97.5** | 06/09/2011 | GAP |
| Toluene-d8 | EPA-8260 | **92.0** | 06/02/2011 | GAP |
| Toluene-d8 4X Dilution | EPA-8260 | **91.3** | 06/09/2011 | GAP |



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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 13:19 |
| CLIENT SAMPLE ID | DC-4-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 4-Bromofluorobenzene | EPA-8260 | **98.9** | 06/02/2011 | GAP |
| 4-Bromofluorobenzene 4X Dilution | EPA-8260 | **95.0** | 06/09/2011 | GAP |

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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 17:17 |
| CLIENT SAMPLE ID | MW-4-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/02/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/02/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **10** | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/02/2011 | GAP |



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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 17:17 |
| CLIENT SAMPLE ID | MW-4-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/02/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/02/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/07/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **2500** | 3.6 | 1 | UG/L | 06/07/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **53000** | 53 | 1 | UG/L | 06/07/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **96.3** | 06/02/2011 | GAP |
| Toluene-d8 | EPA-8260 | **96.8** | 06/02/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **101** | 06/02/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 6/1/2011 10:08 |
| CLIENT SAMPLE ID | DC-8-060111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/03/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 06/03/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/03/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **11** | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/03/2011 | GAP |



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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 6/1/2011 10:08 |
| CLIENT SAMPLE ID | DC-8-060111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/03/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/09/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **110** | 3.6 | 1 | UG/L | 06/09/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **1500** | 53 | 1 | UG/L | 06/09/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **94.3** | 06/03/2011 | GAP |
| Toluene-d8 | EPA-8260 | **95.7** | 06/03/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **99.3** | 06/03/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-13 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 6/1/2011 09:15 |
| CLIENT SAMPLE ID | DC-7-060111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/03/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 06/03/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/03/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **15** | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/03/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 6/1/2011 09:15 |
| CLIENT SAMPLE ID | DC-7-060111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/03/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/09/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **190** | 3.6 | 1 | UG/L | 06/09/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2100** | 53 | 1 | UG/L | 06/09/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **94.0** | 06/03/2011 | GAP |
| Toluene-d8 | EPA-8260 | **96.0** | 06/03/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **100** | 06/03/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 15:47 |
| CLIENT SAMPLE ID | MW-11-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/03/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Acetone | EPA-8260 | **51** | 25 | 4 | UG/L | 06/09/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/03/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/03/2011 | GAP |



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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 15:47 |
| CLIENT SAMPLE ID | MW-11-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/03/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/08/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **170000** | 180 | 50 | UG/L | 06/09/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2500** | 53 | 1 | UG/L | 06/08/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **94.9** | 06/03/2011 | GAP |
| 1,2-Dichloroethane-d4 4X Dilution | EPA-8260 | **99.3** | 06/09/2011 | GAP |
| Toluene-d8 | EPA-8260 | **91.1** | 06/03/2011 | GAP |
| Toluene-d8 4X Dilution | EPA-8260 | **89.0** | 06/09/2011 | GAP |



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| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 5/31/2011 15:47 |
| CLIENT SAMPLE ID | MW-11-053111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 4-Bromofluorobenzene | EPA-8260 | **98.5** | 06/03/2011 | GAP |
| 4-Bromofluorobenzene 4X Dilution | EPA-8260 | **94.5** | 06/09/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 6/10/2011 |
| | | ALS JOB#: | 1106014 |
| | | ALS SAMPLE#: | -15 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 6/1/2011 11:11 |
| CLIENT SAMPLE ID | KMW-2-060111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/03/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Acetone | EPA-8260 | **140** | 25 | 4 | UG/L | 06/09/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/03/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **12** | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/03/2011 | GAP |



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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-15 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 6/1/2011 11:11 |
| CLIENT SAMPLE ID | KMW-2-060111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/03/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/03/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/08/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **13000** | 18 | 5 | UG/L | 06/09/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **12000** | 53 | 1 | UG/L | 06/08/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **94.9** | 06/03/2011 | GAP |
| 1,2-Dichloroethane-d4 4X Dilution | EPA-8260 | **98.2** | 06/09/2011 | GAP |
| Toluene-d8 | EPA-8260 | **96.2** | 06/03/2011 | GAP |
| Toluene-d8 4X Dilution | EPA-8260 | **93.4** | 06/09/2011 | GAP |



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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 6/10/2011<br>1106014<br>-15 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 6/2/2011 |
| CLIENT PROJECT: | Project #123986.03 / N Park | COLLECTION DATE: | 6/1/2011 11:11 |
| CLIENT SAMPLE ID | KMW-2-060111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 4-Bromofluorobenzene | EPA-8260 | **102** | 06/03/2011 | GAP |
| 4-Bromofluorobenzene 4X Dilution | EPA-8260 | **96.2** | 06/09/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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| | | ALS SDG#: | 1106014 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Arnold | | |
| CLIENT PROJECT: | Project #123986.03 / N Park | | |

## LABORATORY BLANK RESULTS

### MB-060611W - Batch 1840 - Water by EPA-8260

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 06/06/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 06/06/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 06/06/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 06/06/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 06/06/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 06/06/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 06/06/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 06/06/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 6/10/2011 |
| | | ALS SDG#: | 1106014 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Arnold | | |
| CLIENT PROJECT: | Project #123986.03 / N Park | | |

## LABORATORY BLANK RESULTS

### MB-060611W - Batch 1840 - Water by EPA-8260

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 06/06/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 06/06/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 06/06/2011 | GAP |

### MB-060311W - Batch 1824 - Water by EPA-6020

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 06/07/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | U | 3.6 | 1 | UG/L | 06/07/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | U | 53 | 1 | UG/L | 06/07/2011 | RAL |



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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 6/10/2011 |
| | | ALS SDG#: | 1106014 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Arnold | | |
| CLIENT PROJECT: | Project #123986.03 / N Park | | |

## LABORATORY CONTROL SAMPLE RESULTS

### ALS Test Batch ID: 1840 - Water by EPA-8260

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| 1,1-Dichloroethene - BS | EPA-8260 | **96.7** | | | 06/06/2011 | GAP |
| 1,1-Dichloroethene - BSD | EPA-8260 | **99.8** | **3** | | 06/06/2011 | GAP |
| Benzene - BS | EPA-8260 | **106** | | | 06/06/2011 | GAP |
| Benzene - BSD | EPA-8260 | **116** | **9** | | 06/06/2011 | GAP |
| Trichloroethene - BS | EPA-8260 | **104** | | | 06/06/2011 | GAP |
| Trichloroethene - BSD | EPA-8260 | **112** | **7** | | 06/06/2011 | GAP |
| Toluene - BS | EPA-8260 | **87.7** | | | 06/06/2011 | GAP |
| Toluene - BSD | EPA-8260 | **96.0** | **9** | | 06/06/2011 | GAP |
| Chlorobenzene - BS | EPA-8260 | **89.9** | | | 06/06/2011 | GAP |
| Chlorobenzene - BSD | EPA-8260 | **98.5** | **9** | | 06/06/2011 | GAP |

### ALS Test Batch ID: 1824 - Water by EPA-6020

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| Iron (Dissolved) - BS | EPA-6020 | **99.4** | | | 06/07/2011 | RAL |
| Iron (Dissolved) - BSD | EPA-6020 | **103** | **3** | | 06/07/2011 | RAL |
| Manganese (Dissolved) - BS | EPA-6020 | **99.3** | | | 06/07/2011 | RAL |
| Manganese (Dissolved) - BSD | EPA-6020 | **101** | **2** | | 06/07/2011 | RAL |
| Potassium (Dissolved) - BS | EPA-6020 | **97.2** | | | 06/07/2011 | RAL |
| Potassium (Dissolved) - BSD | EPA-6020 | **100** | **3** | | 06/07/2011 | RAL |

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| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -01 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/19/2011 14:23 |
| CLIENT SAMPLE ID | DC-16-071911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/25/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/25/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/25/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -01 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/19/2011 14:23 |
| CLIENT SAMPLE ID | DC-16-071911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/25/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/25/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | U | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2100** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -01 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/19/2011 14:23 |
| CLIENT SAMPLE ID | DC-16-071911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **103** | 07/25/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.5** | 07/25/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **102** | 07/25/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -02 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/19/2011 15:20 |
| CLIENT SAMPLE ID | DC-17-071911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/25/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/25/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/25/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -02 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/19/2011 15:20 |
| CLIENT SAMPLE ID | DC-17-071911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/25/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/25/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **160** | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2300** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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## CERTIFICATE OF ANALYSIS

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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -02 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/19/2011 15:20 |
| CLIENT SAMPLE ID | DC-17-071911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **104** | 07/25/2011 | GAP |
| Toluene-d8 | EPA-8260 | **99.0** | 07/25/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **102** | 07/25/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -03 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/19/2011 16:11 |
| CLIENT SAMPLE ID | DC-10B-071911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | **54** | 25 | 4 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -03 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/19/2011 16:11 |
| CLIENT SAMPLE ID | DC-10B-071911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **45000** | 72 | 20 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **3200** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 7/28/2011<br>1107085<br>-03 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/19/2011 16:11 |
| CLIENT SAMPLE ID | DC-10B-071911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **103** | 07/26/2011 | GAP |
| 1,2-Dichloroethane-d4 4X Dilution | EPA-8260 | **105** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.9** | 07/26/2011 | GAP |
| Toluene-d8 4X Dilution | EPA-8260 | **98.7** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **102** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene 4X Dilution | EPA-8260 | **105** | 07/26/2011 | GAP |

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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -04 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 11:11 |
| CLIENT SAMPLE ID | MW-3-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -04 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 11:11 |
| CLIENT SAMPLE ID | MW-3-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **35** | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2000** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 7/28/2011<br>1107085<br>-04 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 11:11 |
| CLIENT SAMPLE ID | MW-3-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **103** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **100** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **103** | 07/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -05 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 09:21 |
| CLIENT SAMPLE ID | MW-10-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 09:21 |
| CLIENT SAMPLE ID | MW-10-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | **4.1** | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **78** | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2200** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -05 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 09:21 |
| CLIENT SAMPLE ID | MW-10-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **103** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **101** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **102** | 07/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -06 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 10:07 |
| CLIENT SAMPLE ID | MW-11-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | **150** | 25 | 10 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 7/28/2011<br>1107085<br>-06 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 10:07 |
| CLIENT SAMPLE ID | MW-11-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **330000** | 360 | 100 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **3000** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -06 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 10:07 |
| CLIENT SAMPLE ID | MW-11-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **102** | 07/26/2011 | GAP |
| 1,2-Dichloroethane-d4 10X Dilution | EPA-8260 | **104** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.9** | 07/26/2011 | GAP |
| Toluene-d8 10X Dilution | EPA-8260 | **98.3** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **102** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene 10X Dilution | EPA-8260 | **104** | 07/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -07 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 08:30 |
| CLIENT SAMPLE ID | KMW-2-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -07 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 08:30 |
| CLIENT SAMPLE ID | KMW-2-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | **44** | 2.0 | 4 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **1200** | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **51000** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -07 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 08:30 |
| CLIENT SAMPLE ID | KMW-2-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **103** | 07/26/2011 | GAP |
| 1,2-Dichloroethane-d4 4X Dilution | EPA-8260 | **104** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **100** | 07/26/2011 | GAP |
| Toluene-d8 4X Dilution | EPA-8260 | **99.1** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **103** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene 4X Dilution | EPA-8260 | **104** | 07/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -08 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 12:01 |
| CLIENT SAMPLE ID | DC-4-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | **77** | 25 | 10 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 7/28/2011<br>1107085<br>-08 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 12:01 |
| CLIENT SAMPLE ID | DC-4-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **71000** | 180 | 50 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **43000** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 7/28/2011<br>1107085<br>-08 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 12:01 |
| CLIENT SAMPLE ID | DC-4-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **104** | 07/26/2011 | GAP |
| 1,2-Dichloroethane-d4 10X Dilution | EPA-8260 | **104** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **96.2** | 07/26/2011 | GAP |
| Toluene-d8 10X Dilution | EPA-8260 | **98.2** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **102** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene 10X Dilution | EPA-8260 | **104** | 07/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -09 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 13:17 |
| CLIENT SAMPLE ID | KMW-7-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -09 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 13:17 |
| CLIENT SAMPLE ID | KMW-7-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **23** | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2200** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 7/28/2011<br>1107085<br>-09 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 13:17 |
| CLIENT SAMPLE ID | KMW-7-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **102** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **99.5** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **104** | 07/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -10 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 15:31 |
| CLIENT SAMPLE ID | DC-3-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -10 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 15:31 |
| CLIENT SAMPLE ID | DC-3-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | **12** | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **16** | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **1900** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -10 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 15:31 |
| CLIENT SAMPLE ID | DC-3-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **106** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **100** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **104** | 07/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -11 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 14:30 |
| CLIENT SAMPLE ID | KMW-3-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -11 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 14:30 |
| CLIENT SAMPLE ID | KMW-3-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | **12** | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **8.6** | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2000** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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## CERTIFICATE OF ANALYSIS

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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -11 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/20/2011 14:30 |
| CLIENT SAMPLE ID | KMW-3-072011 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **104** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.9** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **104** | 07/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -12 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/21/2011 12:11 |
| CLIENT SAMPLE ID | MW-4-072111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -12 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/21/2011 12:11 |
| CLIENT SAMPLE ID | MW-4-072111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | **25** | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **12** | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **91000** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -12 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/21/2011 12:11 |
| CLIENT SAMPLE ID | MW-4-072111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **105** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **99.4** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **105** | 07/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -13 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/21/2011 08:50 |
| CLIENT SAMPLE ID | DC-8-072111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 7/28/2011<br>1107085<br>-13 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/21/2011 08:50 |
| CLIENT SAMPLE ID | DC-8-072111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | **25** | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **64** | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **1500** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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## CERTIFICATE OF ANALYSIS

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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -13 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/21/2011 08:50 |
| CLIENT SAMPLE ID | DC-8-072111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **104** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **99.6** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **105** | 07/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -14 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/21/2011 10:45 |
| CLIENT SAMPLE ID | DC-2-072111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -14 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/21/2011 10:45 |
| CLIENT SAMPLE ID | DC-2-072111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **39** | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2200** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -14 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/21/2011 10:45 |
| CLIENT SAMPLE ID | DC-2-072111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **102** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.3** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **105** | 07/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 7/28/2011<br>1107085<br>-15 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/21/2011 09:45 |
| CLIENT SAMPLE ID | DC-7-072111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -15 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/21/2011 09:45 |
| CLIENT SAMPLE ID | DC-7-072111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | EPA-8260 | **38** | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/26/2011 | GAP |
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **47** | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2200** | 53 | 1 | UG/L | 07/26/2011 | RAL |



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## CERTIFICATE OF ANALYSIS

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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS JOB#: | 1107085 |
| | | ALS SAMPLE#: | -15 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 7/22/2011 |
| CLIENT PROJECT: | N. Park | COLLECTION DATE: | 7/21/2011 09:45 |
| CLIENT SAMPLE ID | DC-7-072111 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **104** | 07/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.8** | 07/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **104** | 07/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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CLIENT: ERM West
1218 - 3rd Ave, Suite 1412
Seattle, WA 98101

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT: N. Park

DATE: 7/28/2011
ALS SDG#: 1107085
WDOE ACCREDITATION: C601

## LABORATORY BLANK RESULTS

### MB-072511W - Batch 1953 - Water by EPA-8260

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 07/25/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 07/25/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 07/25/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 07/25/2011 | GAP |



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CLIENT: ERM West
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CLIENT CONTACT: Mike Arnold
CLIENT PROJECT: N. Park

DATE: 7/28/2011
ALS SDG#: 1107085
WDOE ACCREDITATION: C601

## LABORATORY BLANK RESULTS

### MB-072511W - Batch 1953 - Water by EPA-8260

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 07/25/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 07/25/2011 | GAP |

### MB-072511W - Batch 1952 - Water by EPA-6020

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Iron (Dissolved) | EPA-6020 | U | 220 | 1 | UG/L | 07/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | U | 3.6 | 1 | UG/L | 07/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | U | 53 | 1 | UG/L | 07/26/2011 | RAL |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 7/28/2011 |
| | | ALS SDG#: | 1107085 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Arnold | | |
| CLIENT PROJECT: | N. Park | | |

## LABORATORY CONTROL SAMPLE RESULTS

### ALS Test Batch ID: 1953 - Water by EPA-8260

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| 1,1-Dichloroethene - BS | EPA-8260 | **118** | | | 07/25/2011 | GAP |
| 1,1-Dichloroethene - BSD | EPA-8260 | **120** | **1** | | 07/25/2011 | GAP |
| Benzene - BS | EPA-8260 | **104** | | | 07/25/2011 | GAP |
| Benzene - BSD | EPA-8260 | **113** | **9** | | 07/25/2011 | GAP |
| Trichloroethene - BS | EPA-8260 | **118** | | | 07/25/2011 | GAP |
| Trichloroethene - BSD | EPA-8260 | **119** | **1** | | 07/25/2011 | GAP |
| Toluene - BS | EPA-8260 | **109** | | | 07/25/2011 | GAP |
| Toluene - BSD | EPA-8260 | **116** | **7** | | 07/25/2011 | GAP |
| Chlorobenzene - BS | EPA-8260 | **112** | | | 07/25/2011 | GAP |
| Chlorobenzene - BSD | EPA-8260 | **113** | **1** | | 07/25/2011 | GAP |

### ALS Test Batch ID: 1952 - Water by EPA-6020

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| Iron (Dissolved) - BS | EPA-6020 | **101** | | | 07/26/2011 | RAL |
| Iron (Dissolved) - BSD | EPA-6020 | **102** | **1** | | 07/26/2011 | RAL |
| Manganese (Dissolved) - BS | EPA-6020 | **99.0** | | | 07/26/2011 | RAL |
| Manganese (Dissolved) - BSD | EPA-6020 | **99.4** | **0** | | 07/26/2011 | RAL |
| Potassium (Dissolved) - BS | EPA-6020 | **98.0** | | | 07/26/2011 | RAL |
| Potassium (Dissolved) - BSD | EPA-6020 | **97.6** | **0** | | 07/26/2011 | RAL |

APPROVED BY

Laboratory Director



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November 2, 2011

Mr. Mike Arnold
ERM West
1218 - 3rd Ave, Suite 1412
Seattle, WA 98101

Dear Mr. Arnold,

On October 19th, 15 samples were received by our laboratory and assigned our laboratory project number 1110110. The project was identified as your N Park GW Sampling. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -01 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 09:13 |
| CLIENT SAMPLE ID | DC-16-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/25/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/25/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/25/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/25/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -01 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 09:13 |
| CLIENT SAMPLE ID | DC-16-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/25/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **10** | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2200** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **94.4** | 10/25/2011 | GAP |
| Toluene-d8 | EPA-8260 | **97.4** | 10/25/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **99.1** | 10/25/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -02 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 10:26 |
| CLIENT SAMPLE ID | DC-17-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/25/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/25/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/25/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/25/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -02 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 10:26 |
| CLIENT SAMPLE ID | DC-17-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/25/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **230** | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2300** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **95.5** | 10/25/2011 | GAP |
| Toluene-d8 | EPA-8260 | **97.8** | 10/25/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **104** | 10/25/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -03 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 11:07 |
| CLIENT SAMPLE ID | DC-10B-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/25/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Acetone | EPA-8260 | **31** | 25 | 1 | UG/L | 10/25/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/25/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/25/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -03 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 11:07 |
| CLIENT SAMPLE ID | DC-10B-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/25/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/25/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **1300** | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2700** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **93.3** | 10/25/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.2** | 10/25/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **103** | 10/25/2011 | GAP |

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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -04 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 12:44 |
| CLIENT SAMPLE ID | MW-3-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **6.1** | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -04 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 12:44 |
| CLIENT SAMPLE ID | MW-3-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **23** | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **1900** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **92.6** | 10/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.1** | 10/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **97.9** | 10/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -05 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 08:28 |
| CLIENT SAMPLE ID | MW-11-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acetone | EPA-8260 | **130** | 25 | 10 | UG/L | 10/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/2/2011<br>1110110<br>-05 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 08:28 |
| CLIENT SAMPLE ID | MW-11-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **38000** | 72 | 20 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2600** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **90.5** | 10/26/2011 | GAP |
| 1,2-Dichloroethane-d4 10X Dilution | EPA-8260 | **101** | 10/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **99.4** | 10/26/2011 | GAP |
| Toluene-d8 10X Dilution | EPA-8260 | **95.9** | 10/26/2011 | GAP |



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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/2/2011<br>1110110<br>-05 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 08:28 |
| CLIENT SAMPLE ID | MW-11-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 4-Bromofluorobenzene | EPA-8260 | **99.6** | 10/26/2011 | GAP |
| 4-Bromofluorobenzene 10X Dilution | EPA-8260 | **100** | 10/26/2011 | GAP |

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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -06 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 13:23 |
| CLIENT SAMPLE ID | DC-4-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **22** | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/26/2011 | GAP |



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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/2/2011<br>1110110<br>-06 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 13:23 |
| CLIENT SAMPLE ID | DC-4-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **4.5** | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **11000** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **89.6** | 10/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.2** | 10/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **103** | 10/26/2011 | GAP |

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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -07 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 15:28 |
| CLIENT SAMPLE ID | KMW-7-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/26/2011 | GAP |



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| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -07 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 15:28 |
| CLIENT SAMPLE ID | KMW-7-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **23** | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2200** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **89.9** | 10/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **97.8** | 10/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **105** | 10/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -08 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 14:03 |
| CLIENT SAMPLE ID | DC-2-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -08 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 14:03 |
| CLIENT SAMPLE ID | DC-2-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | **99** | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **110** | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2100** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **90.0** | 10/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **97.9** | 10/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **106** | 10/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -09 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 11:51 |
| CLIENT SAMPLE ID | MW-10-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **4.9** | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -09 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 11:51 |
| CLIENT SAMPLE ID | MW-10-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **96** | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2100** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **90.7** | 10/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **97.5** | 10/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **104** | 10/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -10 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 14:47 |
| CLIENT SAMPLE ID | DC-3-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **6.7** | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -10 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 14:47 |
| CLIENT SAMPLE ID | DC-3-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | **310** | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **14** | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **1800** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **92.4** | 10/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.9** | 10/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **105** | 10/26/2011 | GAP |

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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -11 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 16:06 |
| CLIENT SAMPLE ID | KMW-3-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **11** | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -11 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/18/2011 16:06 |
| CLIENT SAMPLE ID | KMW-3-101811 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | U | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2100** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **92.2** | 10/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **99.8** | 10/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **106** | 10/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -12 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/19/2011 10:08 |
| CLIENT SAMPLE ID | MW-4-101911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **21** | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -12 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/19/2011 10:08 |
| CLIENT SAMPLE ID | MW-4-101911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | U | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **100000** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **92.3** | 10/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.6** | 10/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **107** | 10/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -13 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/19/2011 08:46 |
| CLIENT SAMPLE ID | DC-8-101911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **26** | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/26/2011 | GAP |



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -13 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/19/2011 08:46 |
| CLIENT SAMPLE ID | DC-8-101911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | **35** | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **84** | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **1500** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **94.2** | 10/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **98.7** | 10/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **106** | 10/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -14 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/19/2011 09:24 |
| CLIENT SAMPLE ID | DC-7-101911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **42** | 2.0 | 4 | UG/L | 10/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/26/2011 | GAP |



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| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -14 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/19/2011 09:24 |
| CLIENT SAMPLE ID | DC-7-101911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **82** | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **2500** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **95.8** | 10/26/2011 | GAP |
| 1,2-Dichloroethane-d4 4X Dilution | EPA-8260 | **103** | 10/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **96.8** | 10/26/2011 | GAP |
| Toluene-d8 4X Dilution | EPA-8260 | **94.6** | 10/26/2011 | GAP |



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| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE:<br>ALS JOB#:<br>ALS SAMPLE#: | 11/2/2011<br>1110110<br>-14 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/19/2011 09:24 |
| CLIENT SAMPLE ID | DC-7-101911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 4-Bromofluorobenzene | EPA-8260 | **106** | 10/26/2011 | GAP |
| 4-Bromofluorobenzene 4X Dilution | EPA-8260 | **99.4** | 10/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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| | | | |
|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -15 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/19/2011 11:04 |
| CLIENT SAMPLE ID | KMW-2-101911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/26/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/26/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | **40** | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/26/2011 | GAP |



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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS JOB#: | 1110110 |
| | | ALS SAMPLE#: | -15 |
| CLIENT CONTACT: | Mike Arnold | DATE RECEIVED: | 10/19/2011 |
| CLIENT PROJECT: | N Park GW Sampling | COLLECTION DATE: | 10/19/2011 11:04 |
| CLIENT SAMPLE ID | KMW-2-101911 | WDOE ACCREDITATION: | C601 |

## DATA RESULTS

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/26/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/26/2011 | GAP |
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | **17** | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | **70000** | 53 | 1 | UG/L | 10/26/2011 | RAL |

| SURROGATE | METHOD | %REC | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | EPA-8260 | **97.0** | 10/26/2011 | GAP |
| Toluene-d8 | EPA-8260 | **96.1** | 10/26/2011 | GAP |
| 4-Bromofluorobenzene | EPA-8260 | **104** | 10/26/2011 | GAP |

U - Analyte analyzed for but not detected at level above reporting limit.



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## CERTIFICATE OF ANALYSIS

CLIENT: ERM West
1218 - 3rd Ave, Suite 1412
Seattle, WA 98101

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT: N Park GW Sampling

DATE: 11/2/2011
ALS SDG#: 1110110
WDOE ACCREDITATION: C601

## LABORATORY BLANK RESULTS

### MB-102411W - Batch 2219 - Water by EPA-8260

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Chloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Vinyl Chloride | EPA-8260 | U | 0.20 | 1 | UG/L | 10/24/2011 | GAP |
| Bromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Chloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Trichlorofluoromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Acetone | EPA-8260 | U | 25 | 1 | UG/L | 10/24/2011 | GAP |
| Carbon Disulfide | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,1-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Methylene Chloride | EPA-8260 | U | 5.0 | 1 | UG/L | 10/24/2011 | GAP |
| Acrylonitrile | EPA-8260 | U | 10 | 1 | UG/L | 10/24/2011 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,1-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 2-Butanone | EPA-8260 | U | 10 | 1 | UG/L | 10/24/2011 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 2,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Bromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Chloroform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,1-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Carbon Tetrachloride | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,2-Dichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Trichloroethene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,2-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Dibromomethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Bromodichloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | U | 10 | 1 | UG/L | 10/24/2011 | GAP |
| Toluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Cis-1,3-Dichloropropene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 2-Hexanone | EPA-8260 | U | 10 | 1 | UG/L | 10/24/2011 | GAP |
| 1,3-Dichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Tetrachloroethylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Dibromochloromethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,2-Dibromoethane | EPA-8260 | U | 0.010 | 1 | UG/L | 10/24/2011 | GAP |



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Seattle, WA 98101

CLIENT CONTACT: Mike Arnold
CLIENT PROJECT: N Park GW Sampling

DATE: 11/2/2011
ALS SDG#: 1110110
WDOE ACCREDITATION: C601

## LABORATORY BLANK RESULTS

### MB-102411W - Batch 2219 - Water by EPA-8260

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Ethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| m,p-Xylene | EPA-8260 | U | 4.0 | 1 | UG/L | 10/24/2011 | GAP |
| Styrene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| o-Xylene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Bromoform | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Isopropylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Bromobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| N-Propyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 2-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 4-Chlorotoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| T-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| S-Butyl Benzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| P-Isopropyltoluene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| N-Butylbenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | U | 10 | 1 | UG/L | 10/24/2011 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Hexachlorobutadiene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| Naphthalene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | U | 2.0 | 1 | UG/L | 10/24/2011 | GAP |

### MB-102511W - Batch 2225 - Water by EPA-6020

| ANALYTE | METHOD | RESULTS | REPORTING LIMITS | DILUTION FACTOR | UNITS | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Iron (Dissolved) | EPA-6020 | U | 24 | 1 | UG/L | 10/26/2011 | RAL |
| Manganese (Dissolved) | EPA-6020 | U | 3.6 | 1 | UG/L | 10/26/2011 | RAL |
| Potassium (Dissolved) | EPA-6020 | U | 53 | 1 | UG/L | 10/26/2011 | RAL |



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|---|---|---|---|
| CLIENT: | ERM West<br>1218 - 3rd Ave, Suite 1412<br>Seattle, WA 98101 | DATE: | 11/2/2011 |
| | | ALS SDG#: | 1110110 |
| | | WDOE ACCREDITATION: | C601 |
| CLIENT CONTACT: | Mike Arnold | | |
| CLIENT PROJECT: | N Park GW Sampling | | |

## LABORATORY CONTROL SAMPLE RESULTS

### ALS Test Batch ID: 2219 - Water by EPA-8260

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| 1,1-Dichloroethene - BS | EPA-8260 | **113** | | | 10/24/2011 | GAP |
| 1,1-Dichloroethene - BSD | EPA-8260 | **114** | **1** | | 10/24/2011 | GAP |
| Benzene - BS | EPA-8260 | **103** | | | 10/24/2011 | GAP |
| Benzene - BSD | EPA-8260 | **104** | **1** | | 10/24/2011 | GAP |
| Trichloroethene - BS | EPA-8260 | **115** | | | 10/24/2011 | GAP |
| Trichloroethene - BSD | EPA-8260 | **118** | **3** | | 10/24/2011 | GAP |
| Toluene - BS | EPA-8260 | **103** | | | 10/24/2011 | GAP |
| Toluene - BSD | EPA-8260 | **105** | **2** | | 10/24/2011 | GAP |
| Chlorobenzene - BS | EPA-8260 | **105** | | | 10/24/2011 | GAP |
| Chlorobenzene - BSD | EPA-8260 | **106** | **1** | | 10/24/2011 | GAP |

### ALS Test Batch ID: 2225 - Water by EPA-6020

| SPIKED COMPOUND | METHOD | %REC | RPD | QUAL | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|
| Iron (Dissolved) - BS | EPA-6020 | **97.2** | | | 10/26/2011 | RAL |
| Iron (Dissolved) - BSD | EPA-6020 | **98.8** | **2** | | 10/26/2011 | RAL |
| Manganese (Dissolved) - BS | EPA-6020 | **97.5** | | | 10/26/2011 | RAL |
| Manganese (Dissolved) - BSD | EPA-6020 | **99.0** | **2** | | 10/26/2011 | RAL |
| Potassium (Dissolved) - BS | EPA-6020 | **96.4** | | | 10/26/2011 | RAL |
| Potassium (Dissolved) - BSD | EPA-6020 | **100** | **4** | | 10/26/2011 | RAL |

APPROVED BY

Laboratory Director



ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

Environmental www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

**ALS Environmental**
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
(206) 292-9059 Seattle
(425) 356-2626 Fax
http://www.alsglobal.com

# Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only) 111010

Date 10/19/2011 Page 1 Of 2

PROJECT ID: N Park GW Sampling
REPORT TO COMPANY: ERM
PROJECT MANAGER: Mike Arnold
ADDRESS: 1218 3rd Ave Suite 1412 Seattle WA 98101
PHONE: 425 462 8591 FAX: —
P.O. NUMBER: 123986 E-MAIL: mike.arnold@erm.com

INVOICE TO COMPANY: ERM Walnut Creek
ATTENTION: Billing Dep.
ADDRESS:

ANALYSIS REQUESTED | OTHER (Specify)

| SAMPLE I.D. | DATE | TIME | TYPE | LAB# | NWTPH-HCID | NWTPH-DX | NWTPH-GX | BTEX by EPA-8021 | MTBE by EPA-8021 EPA-8260 | Halogenated Volatiles by EPA 8260 | Volatile Organic Compounds by EPA 8260 | EDB / EDC by EPA 8260 SIM (water) | EDB / EDC by EPA 8260 (soil) | Semivolatile Organic Compounds by EPA 8270 | Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM | PCB Pesticides by EPA 8081/8082 | Metals-MTCA-5 RCRA-8 Pri Pol TAL | Metals Other (Specify) | TCLP-Metals VOA Semi-Vol Pest Herbs | Dissolved Fe, Mn, K | NUMBER OF CONTAINERS | RECEIVED IN GOOD CONDITION? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. DC-16-101811 | 10/18/11 | 0913 | W | 1 | | | | | | | X | | | | | | | | | X | 4 | |
| 2. DC-17-101811 | 10/18/11 | 1026 | | 2 | | | | | | | X | | | | | | | | | X | | |
| 3. DC-10B-101811 | 10/18/11 | 1107 | | 3 | | | | | | | X | | | | | | | | | X | | |
| 4. MW-3-101811 | 10/18/11 | 1244 | | 4 | | | | | | | X | | | | | | | | | X | | |
| 5. MW-11-101811 | 10/18/11 | 0828 | | 5 | | | | | | | X | | | | | | | | | X | | |
| 6. DC-4-101811 | | 1323 | | 6 | | | | | | | X | | | | | | | | | X | | |
| 7. MW-7-101811 | | 1528 | | 7 | | | | | | | X | | | | | | | | | X | | |
| 8. DC-2-101811 | | 1403 | | 8 | | | | | | | X | | | | | | | | | X | | |
| 9. MW-10-101811 | | 1151 | | 9 | | | | | | | X | | | | | | | | | X | | |
| 10. DC-3-101811 | — | 1447 | — | 10 | | | | | | | X | | | | | | | | | X | | |

LABORATORY COPY

SPECIAL INSTRUCTIONS Electronic results only

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Matt Crandell, ERM, 10/19/2011, 1300
   Received By: ALS 10-19-11 1330
2. Relinquished By:
   Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: (X) Standard 5 3 2 1 SAME DAY

Fuels & Hydrocarbon Analysis: 5 Standard 3 1 SAME DAY

OTHER: Specify:

* Turnaround request less than standard may incur Rush Charges

**ALS Environmental**
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
(206) 292-9059 Seattle
(425) 356-2626 Fax
http://www.alsglobal.com

# Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only) 1110110

Date 10/19/2011 Page 2 Of 2

PROJECT ID: N Park GW Sampling
REPORT TO COMPANY: ERM
PROJECT MANAGER: Mike Arnold
ADDRESS: 1218 3rd Ave Suite 1412 Seattle, WA 98199
PHONE: 425.462.8591 FAX: —
P.O. NUMBER: 123986 E-MAIL: mike.arnold@erm.com
INVOICE TO COMPANY: ERM Walnut Creek
ATTENTION: Billing Dep.
ADDRESS:

ANALYSIS REQUESTED | OTHER (Specify)

| SAMPLE I.D. | DATE | TIME | TYPE | LAB# |
|---|---|---|---|---|
| 1. KMW-3-101811 | 10/18/11 | 1606 | W | 11 |
| 2. MW-4-101911 | 10/19/11 | 1008 | | 12 |
| 3. DC-8-101911 | | 0846 | | 13 |
| 4. DC-7-101911 | | 0924 | | 14 |
| 5. KMW-2-101911 | | 1104 | | 15 |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |

Volatile Organic Compounds by EPA 8260: X X X X X
Dissolved Fe, Mn, IC: X X X X X
NUMBER OF CONTAINERS: 4

MC 10/19/2011

LABORATORY COPY

SPECIAL INSTRUCTIONS Electronic results only

SIGNATURES (Name, Company, Date, Time):
1. Relinquished By: Matt Crandell (ERM), 10/19/2011, 1300
Received By: ALS 10-19-11 / 13:30
2. Relinquished By:
Received By:

TURNAROUND REQUESTED in Business Days*
Organic, Metals & Inorganic Analysis: X Standard | 5 | 3 | 2 | 1 | SAME DAY
Fuels & Hydrocarbon Analysis: 5 Standard | 3 | 1 | SAME DAY
OTHER: Specify:

* Turnaround request less than standard may incur Rush Charges

**Environmental Resources Management**

1218 3rd Avenue
Suite 1412
Seattle, WA 98101
(425) 462-8591
(425) 455-3573 (fax)
www.erm.com

10 July 2012

*Via Electronic Mail*

Ms. Courtney Seim
Riddell Williams, P.S.
1001 Fourth Avenue Plaza, Suite 4500
Seattle, Washington 98154-1065

Mr. Robert L. DiJulio
Wolfstone, Panchot & Bloch, P.S., Inc.
1111 Third Avenue, Suite 1800
Seattle, Washington 98101

Subject: Progress Report – October 2011 through April 2012
Soil Vapor Extraction System
Harris/Manhattan Village Shopping Center
Normandy Park, Washington

Dear Ms. Seim and Mr. DiJulio:

ERM-West, Inc. (ERM) has prepared this Progress Report for the soil vapor extraction (SVE) system installed at the Harris and Manhattan Village Shopping Center (MVSC) properties in Normandy Park, Washington (the "site"). This report has been prepared in accordance with the *Final Soil Vapor Extraction Interim Remedial Action Design and Work Plan* dated March 2009, and the proposal dated 17 November 2011 to extend the operational period of the SVE system through April 2012.

This operational period represents months 23 through 30 (September 2011 – April 2012) of SVE system operation. O&M activities during this period were completed on 15 September 2011, 9 December 2011, 9 February 2012, and 8 March 2012. System O&M included the following tasks:

- Recording extraction well head and SVE system gauge measurements, including air flow rate, temperature, vacuum pressure, and organic vapor concentration;
- Measuring well head vacuum at the vapor monitoring points and two groundwater monitoring wells partially screened in the vadose zone;
- Sampling and laboratory analysis of the SVE effluent vapor stream;

- Collecting well head vapor samples from all 10 SVE wells during one monitoring event for the purpose of evaluating the most effective well set to operate for the remaining duration of SVE operation;
- Changing the configuration of the SVE extraction wells; and
- Completing standard maintenance on the SVE system (e.g., checking/changing the oil and drive belt of the blower and checking/changing the air filter).

This O&M report discusses the conclusion of the September 2011 O&M period, which began on 8 August 2011 and ended on 15 September 2011, and the entirety of the October 2011 through April 2012 O&M period which began on 15 September 2011 and ended on 30 April 2012.

***September 2011 Operation and Maintenance Period***

During the September 2011 O&M period, the SVE wells SVE-2, SVE-3, SVE-5, SVE-6, SVE -7, and SVE-10 were operated as extraction wells and the remaining wells SVE-1, SVE-4, SVE-8, and SVE-9 acted as air intake wells. The concentration of the effluent stack sample collected in September 2011 was lower than the datum collected one year prior during September of 2010 (Table C-1 in Attachment C), as well as a slightly lower contaminant mass extraction rate compared to the wells operated under vacuum during the August O&M period. This reduction in PCE concentrations in vapors suggest that the PCE recovery rate continues to decrease as residual PCE is removed from the subsurface.

***October 2011 through April 2012 Operation and Maintenance Period***

The September operational configuration was maintained through November 2011. On 18 November 2011 each of the SVE wells were configured to operate as extraction wells. On 9 December 2011, after operating the wells in this configuration for approximately three weeks, a vapor sample was collected from each well using a vacuum summa canister. Each vapor sample was analyzed by ALS Laboratory Group located in Salt Lake City, Utah, by United States Environmental Protection Agency Method TO-15. Analytical results are summarized in Table 1 of Attachment A.

ERM used the results of the December 2011 vapor sampling event to develop an optimized configuration of SVE extraction and venting wells to maximize the extraction of vapors from areas with the highest PCE concentrations in the samples. This new configuration was applied at the in January 2012, and the system operated under this configuration through April 2012. As shown on Table 1, this

configuration included active vapor extraction at wells SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, and SVE-10 and venting at the remaining SVE wellheads.

*Table 1 SVE Well Groupings*

| | |
|---|---|
| **September 2011 Operating Wells** | SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, and SVE-7 |
| **December 2011 Operating Wells** | SVE-1, SVE-2, SVE-3, SVE-4, SVE-5, SVE-6, SVE-7, SVE-8, SVE-9, and SVE-10 |
| **January through April 2012 Operating Wells** | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, and SVE-10 |

Complete laboratory analytical results for the vapor samples are included in Attachment B. Sampling data and analytical results from the O&M activities were recorded and entered into data spreadsheets, which are included as Attachment C. The results of these tasks are presented below.

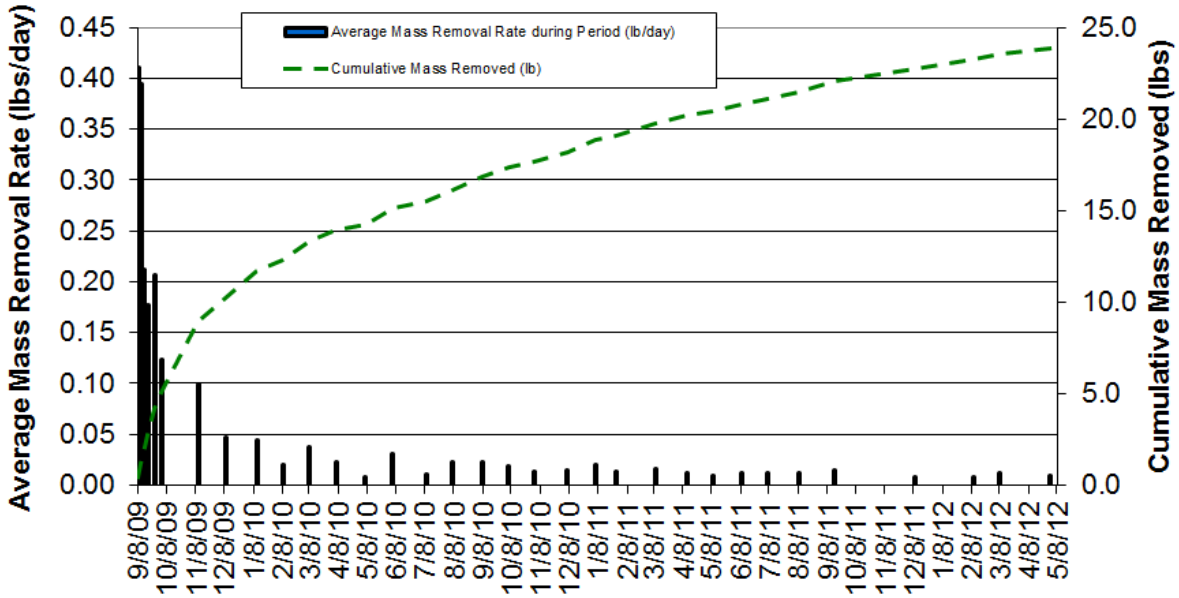
The effluent vapor sample collected from the September 2011 well set on 15 September 2011 contained PCE at a concentration of 2,900 micrograms per cubic meter [$\mu g/m^3$]. The average of that value and the PCE concentration detected in the 8 August 2011 vapor sample (2,000 $\mu g/m^3$), is 2,450 $\mu g/m^3$. The average PCE concentration and the effluent flow rate were used to calculate the mass removal rate for September 2011 (0.02 pounds/day).

The effluent sample collected in December 2011 during the operation of each of the SVE wells as extraction wells contained a PCE concentration of 1,300 $\mu g/m^3$. The concentration of PCE in the effluent vapor samples collected from the January through April 2012 well set in February 2012 and March 2012 were 1,800 $\mu g/m^3$ and 1,400 $\mu g/m^3$, respectively. The average extraction rate during this period was 0.01 pounds per day.

*Mass Removal Estimates*

Based on laboratory analytical results from the initial monitoring events and system flow readings, it is estimated that a total of approximately 24.3 pounds of PCE were recovered by the system as of 30 April 2012. Figure 1 presents a summary of average mass removal rates and cumulative mass removed by the system. Calculations of the estimated mass removal rate of PCE are presented in Attachment D.

*Figure 1* *Estimated PCE Average Mass Removal Rates and Cumulative Mass Removed During Monitoring Period*




### *Vacuum Measurements*

Vacuum measurements were collected using Magnehelic vacuum gauges at each of six vapor monitoring points and at two monitoring wells screened in the vadose zone during the monitoring events in September and December 2011, and February and March 2012. The vacuum readings confirm that an average SVE radius of influence of approximately 100 feet is generally being achieved across the site. This is consistent with interpretations of previously-collected vacuum data sets. The radius of influence achieved at the site by the current configuration, based on data collected in March 2012, is presented in Figure 2 below.

Vacuum readings at SVE-10 have been less than expected given that the well is being operated as an extraction well. Ongoing investigation is being conducted to evaluate the cause of the readings.

### *Condensate Collection*

The SVE system generated approximately 1,200 gallons of condensate water during

the September 2011 – April 2012 operational period. The condensate water is considered a hazardous waste and was transported from the site by a licensed waste hauler for disposal at an appropriate facility.

***Summary***

In summary, based on observed mass removal rates and vacuum measurements to date, the SVE system is operating as designed and continues to remove PCE mass from the subsurface.

We appreciate the opportunity to provide you with ongoing environmental consulting and remediation services. Please call Josh Hancock at (425) 214-0472 if you have questions regarding this progress report.

Sincerely,

Joshua Hancock, E.I.T.
*Project Manager*

Erik C. Ipsen, P.E.
*Partner*

JTH/AMA/ECI/0117205.03
Attachments

*Figure*

Project No. 0117205.03
Date: 07/03/12
Drawn By: L. Castro
CAD File: f:\0117205\03\011720503-18.dwg

HARRIS PROPERTY

RESIDENCE
RESIDENCE
COMMERCIAL BUILDING
CONDOMINIUMS
VACANT SHED
WELL HOUSE
FORMER SEPTIC TANK
FORMER LAUNDROMAT/ DRY CLEANER
FORMER DAIRY QUEEN
GRAVEL
PHONE BOOTH
SIGN
RETAINING WALL
TREATMENT SYSTEM
SECOND BUILDING (VARIOUS SHOPS)
FOUR STAR DRY CLEANERS
MANHATTAN VILLAGE SHOPPING CENTER
ASPHALT PARKING LOT
ASPHALT PARKING LOT (APPROXIMATE ELEVATION = 313.5')
BUILDING
UNDEVELOPED VEGETATED AREA (APPROXIMATE ELEVATION = 308.5')

2nd AVE SW
1st AVE S

KMW-5D
KMW-5
KMW-4
KMW-1
KMW-2
KMW-9
MW-1
MW-2
MW-3
MW-4
DC-1*
0.00
DC-2
DC-3
DC-4
DC-5
DC-6
DC-9A
DC-9B
DC-10A
DC-10B
DC-11
DC-12
DC-13
DC-15
DC-16
DC-17
DC-18
DC-19
0.30

VMP-1
0.04
VMP-2
0.44
VMP-3
0.43
VMP-4
1.7
VMP-5
0.42
VMP-6
1.9

SVE-1
3.7
SVE-2
0.53
SVE-3
9.0
SVE-4
0.87
SVE-5
10.0
SVE-6
12.0
SVE-7
13.0
SVE-8
1.3
SVE-9
0.44
SVE-10
0.20

0.01
0.1
1.0
10.0

50' (TYP)

LEGEND

- EXISTING MONITORING WELL
- PROPOSED SVE WELL
- EXISTING VAPOR MONITORING WELL
- PROPOSED GROUND SVE PIPING
- PROPOSED UNDERGROUND SVE PIPING
- INFERRED LIMITS OF PCE IMPACTED SOILS OVER MTCA METHOD A CLEANUP LEVEL
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING GAS UTILITY LINE
- EXISTING ELECTRICAL LINE
- EXISTING WATER LINE
- MVSC PROPERTY LINE
- HARRIS PROPERTY LINE
- * WATER LEVEL ABOVE SCREENED INTERVAL
- -10.0- ISOBARIC CONTOURS DASHED WHERE INFERRED

MVSC – MANHATTAN VILLAGE SHOPPING CENTER
SVE – SOIL VAPOR EXTRACTION
PCE – TETRACHLOROETHENE

N

0 25' 50' 100'
SCALE IN FEET

Figure 2
*March 2012 Vacuum Measurements and Radius of Influence MVSC/Harris Properties Normandy Park, Washington*
ERM 07/12

*Attachment A*
*Laboratory Analytical Results*

## *Table 1 Soil Vapor Extraction Effluent Sample Results for 8 September 2009 – 8 March 2012*

| Sample ID | Well Grouping/ SVE Wells | Sample Location | Date of Sample | PCE Conc. (ppbv) | PCE Conc. (µg/m³) |
|---|---|---|---|---|---|
| STK-1-090809 | A | Effluent Stack | 9/8/09 | 11,000 | 74,000 |
| STK-1-091009 | A | Effluent Stack | 9/10/09 | 10,000 | 69,000 |
| STK-1-091409 | A | Effluent Stack | 9/14/09 | 1,300 | 8,500 |
| STK-1-091809 | A | Effluent Stack | 9/18/09 | 8,000 | 54,000 |
| STK-1-092509 | A | Effluent Stack | 9/25/09 | 2,600 | 18,000 |
| STK-1-100209 | A | Effluent Stack | 10/2/09 | 3,700 | 25,000 |
| STK-1-111009 | B | Effluent Stack | 11/10/09 | 1,200 | 8,100 |
| STK-1-A-121009 | A | Effluent Stack | 12/10/09 | 800 | 5,500 |
| STK-1-B-121009 | B | Effluent Stack | 12/10/09 | 870 | 5,900 |
| STK-1-B-011110 | B | Effluent Stack | 1/11/10 | 830 | 5,700 |
| STK-1-A-011110 | A | Effluent Stack | 1/11/10 | 240 | 1,600 |
| STK-1-A-020810 | A | Effluent Stack | 2/8/10 | 610 | 4,100 |
| STK-1-B-020810 | B | Effluent Stack | 2/8/10 | 670 | 4,600 |
| STK-1-B-030810 | B | Effluent Stack | 3/8/10 | 860 | 5,800 |
| STK-1-A-030810 | A | Effluent Stack | 3/8/10 | 190 | 1,300 |
| STK-1-A-040510 | A | Effluent Stack | 4/5/10 | 730 | 5,000 |
| STK-1-B-040510 | B | Effluent Stack | 4/5/10 | 190 | 1,300 |
| STK-1-B-050610 | B | Effluent Stack | 5/6/10 | 140 | 960 |
| STK-1-A-050610 | A | Effluent Stack | 5/6/10 | 940 | 6,400 |
| STK-1-A-060410 | A | Effluent Stack | 6/4/10 | 480 | 3,300 |
| STK-1-B-060410 | B | Effluent Stack | 6/4/10 | 400 | 2,700 |
| STK-1-B-070910 | B | Effluent Stack | 7/9/10 | 110 | 750 |
| STK-1-A-070910 | A | Effluent Stack | 7/9/10 | 180 | 1,200 |
| STK-1-A-080610 | A | Effluent Stack | 8/6/10 | 900 | 6,100 |
| STK-1-B-080610 | B | Effluent Stack | 8/6/10 | 520 | 3,500 |
| STK-1-B-090710 | B | Effluent Stack | 9/7/10 | 590 | 4,000 |
| STK-1-A-090710 | A | Effluent Stack | 9/7/10 | 270 | 1,800 |
| STK-1-A-100510 | A | Effluent Stack | 10/5/10 | 610 | 4,100 |
| STK-1-B-100510 | B | Effluent Stack | 10/5/10 | 280 | 1,900 |
| STK-1-B-1101010 | B | Effluent Stack | 11/1/10 | 320 | 2,100 |

| Sample ID | Well Grouping/ SVE Wells | Sample Location | Date of Sample | PCE Conc. (ppbv) | PCE Conc. (µg/m³) |
|---|---|---|---|---|---|
| STK-1-C-110110 | C | Effluent Stack | 11/1/10 | 260 | 1,800 |
| STK-1-C-120610 | C | Effluent Stack | 12/6/10 | 360 | 2,400 |
| STK-1-D-120610 | D | Effluent Stack | 12/6/10 | 380 | 2,600 |
| STK-1-D-010511 | D | Effluent Stack | 1/5/11 | 440 | 3,000 |
| STK-1-E-010511 | E | Effluent Stack | 1/5/11 | 250 | 1,700 |
| STK-1-E-012611 | E | Effluent Stack | 1/26/11 | 260 | 1,800 |
| STK-1-F-012611 | F | Effluent Stack | 1/26/11 | 330 | 2,300 |
| STK-1-030911-1035 | SVE-1,SVE-2,SVE-3,SVE-5,SVE-6,SVE-7,SVE-8 | Effluent Stack | 3/9/11 | 350 | 2,400 |
| STK-1-030911-1149 | SVE-2,SVE-3,SVE-5,SVE-6,SVE-7 | Effluent Stack | 3/9/11 | 320 | 2,200 |
| STK-1-041111-1640 | SVE-2,SVE-3,SVE-5,SVE-6,SVE-7 | Effluent Stack | 4/11/11 | 210 | 1,400 |
| STK-1-041111-1730 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | Effluent Stack | 4/11/11 | 160 | 1,100 |
| STK-1-050911-1142 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | Effluent Stack | 5/9/11 | 240 | 1,600 |
| STK-1-050911-1255 | SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | Effluent Stack | 5/9/11 | 220 | 1,500 |
| STK-1-060811-1038 | SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, SVE-7, | Effluent Stack | 6/8/11 | 320 | 2,200 |
| STK-1-060811-1152 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | Effluent Stack | 6/8/11 | 320 | 2,200 |
| STK-1-070611-1026 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | Effluent Stack | 7/6/11 | 200 | 1,400 |

| Sample ID | Well Grouping/ SVE Wells | Sample Location | Date of Sample | PCE Conc. (ppbv) | PCE Conc. (µg/m3) |
|---|---|---|---|---|---|
| STK-1-070611-1144 | SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | Effluent Stack | 7/6/11 | 190 | 1,300 |
| STK-1-070611-1144 | SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | Effluent Stack | 8/9/11 | 340 | 2,300 |
| STK-1-070611-1240 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | Effluent Stack | 8/9/11 | 300 | 2,000 |
| STK-1-091511-1242 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | Effluent Stack | 9/15/11 | 430 | 2,900 |
| STK-1-091511-1450 | SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, and SVE-7 | Effluent Stack | 9/15/11 | 330 | 2,300 |
| STK-1-121611 | SVE-1, SVE-2, SVE-3, SVE-4, SVE-5, SVE-6, SVE-7, SVE-8, SVE-9, SVE-10 | Effluent Stack | 12/16/11 | 190 | 1,300 |
| STK-1-020912 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | Effluent Stack | 2/09/12 | 270 | 1,800 |
| STK-1-030812 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | Effluent Stack | 12/16/11 | 200 | 1,400 |

**Notes:**
µg/$m^3$ = micrograms per cubic meter
ppbv = parts per billion by volume

*Attachment B*
*Laboratory Analytical Data Package*

W 1206921

# Chain of Custody / Analytical Request Form

**Canada Toll Free: 1 800 668 9878**

**www.alsglobal.com**

COC # _____

1206921

Page 1 of 1

| **Report To** | | **Report Format / Distribution** | **Service Requested** (Rush for routine analysis subject to availability) |
|---|---|---|---|
| Company: | ERM-West | ☐ Standard ☐ Other | ◉ Regular (Default) |
| Contact: | Cyrus Gorman | ☑ PDF ☐ Excel ☐ Digital ☐ Fax | ○ Priority (Specify Date Required → → ) Surcharges apply |
| Address: | 1218 3rd Ave Ste 1412 | Email 1: cyrus.gorman@erm.com | ○ Emergency (1 Business Day) - 100% Surcharge |
| | Seattle Washington, 98101 | Email 2: | ○ For Emergency < 1 Day, ASAP or Weekend - Contact ALS |
| Phone: | 425-214-0468 Fax: 425-455-3573 | | |
| **Invoice To** | Same as Report ? ☐ Yes ☑ No | **Client / Project Information** | **Analysis Request** |
| Company: | ERM-West | Job #: 117205.03 | Please indicate below Filtered, Preserved or both (F, P, F/P) |
| Contact: | Accounts Payable | PO / AFE: | |
| Address: | 1277 Treat Boulevard, Suite 500 | LSD: | |
| | Walnut Creek, California 94597 | | |
| Phone: | 925-482-3213 Fax: | Quote #: | |
| Lab Work Order # (lab use only) | | **ALS Contact:** | **Sampler:** Matt Crandell |

| Sample # | Sample Identification (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | TO-15 (PCE) | Number of Containers |
|---|---|---|---|---|---|---|
| 01 | Stk-1-030812 | 08-Mar-12 | 12:28 | Air | X | 1 |
| | | | | | | |
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MC 3/8/2012

**Special Instructions / Regulations / Hazardous Details**

Please include Job # on the invoice Units: ppb and ug/m^3 Stk-1-030812 Sample Name

**Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.**

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

**Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.**

| SHIPMENT RELEASE (client use) | | | SHIPMENT RECEPTION (lab use only) | | | | SHIPMENT VERIFICATION (lab use only) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Released by: | Date (dd-mmm-yy) | Time (hh-mm) | Received by: | Date: | Time: | Temperature: °C | Verified by: | Date: | Time: | Observations: Yes / No ? If Yes add SIF |
| | | | | 3/9/12 | 3/9/12 9:55 | | | | | |

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

# Canister Chain of Custody

| | |
|---|---|
| Client: ERM | Project/Job/Task: |
| Account No: | |

**Please do not apply adhesive labels directly on Canisters**

**Manilla tags are provided, attached to Canisters for your convenience, to apply adhesive labels**

| Canister Serial No.: | Date Cleaned | Initial Vacuum (inches of Hg vacuum) | VFR flow rate (ml/min) | Initials: | Field Vacuum before sampling (inches of Hg vacuum) | Final Vacuum after sampling (Inches of Hg vacuum) | Client Sample Identification | Other Client Information | ALS use only |
|---|---|---|---|---|---|---|---|---|---|
| 0146 | 02-27-12 | -25 | | L | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| VFR Serial No.: | | | | | | | | | |
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| | | | | | | | | | |

Original Field Sample Chain-of-Custody

| Relinquished By: (Signature) | Date/Time | Received By: (Signature) | Reason for Transfer/Storage Location |
|---|---|---|---|
| [signature] | 03-07-12 15:22 | [signature] 3/9/12 9:15 | |
| | | | |
| | | | |

Return to:
ALS Laboratory Group
960 W. LeVoy Drive
Salt Lake City, UT 84123
800-356-9135

**If canisters are kept for longer than the original project scheduled sampling, a $40 per can - per week rental fee will be assessed. If a project is cancelled after ALS has shipped cans, in addition to the cost of the initial shipping, a $40 weekly rental fee will be charged for each unused can until they are returned to ALS.**

# ANALYTICAL REPORT

Report Date: March 15, 2012

Cyrus Gorman
ERM
1218 3rd Ave.
Suite 1412
Seattle, WA 98101

Phone: (425) 214-0468

E-mail: cyrus.gorman@erm.com

Workorder: **34-1206921**
Project ID: 117205.03 030912
Purchase Order: 117205.03

| Client Sample ID | Lab ID | Collect Date | Receive Date | Sampling Site |
|---|---|---|---|---|
| Stk-1-030812 | 1206921001 | 03/08/12 | 03/09/12 | 117205.03 |

# ANALYTICAL REPORT

**Workorder:** 34-1206921
**Client:** ERM
**Project Manager:** Paul E. Pope

## Analytical Results

| | | | | | |
|---|---|---|---|---|---|
| Sample ID: | Stk-1-030812 | Sampling Site: | 117205.03 | Collected: | 03/08/2012 |
| Lab ID: | 1206921001 | Media: | Sulfur Summa 6 Liter | Received: | 03/09/2012 |
| Matrix: | Air | Sampling Parameter: | NA | | |

**Analysis Method - EPA TO-15**

| | | | |
|---|---|---|---|
| **Preparation:** Not Applicable | **Analysis:** EPA TO-15, Air | **Instrument ID:** | 5972-W |
| | **Batch:** IVOA/1928 (HBN: 82903) | **Percent Solid:** | NA |
| | **Analyzed:** 03/09/2012 16:32 | **Report Basis:** | Wet |

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **200** | **1400** | 1.5 | 5.0 | **10** | |

## Report Authorization

| Method | Analyst | Peer Review |
|---|---|---|
| **EPA TO-15** | Lisa M. Reid | Matthew Goetz |

## Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

# ANALYTICAL REPORT

**Workorder:** 34-1206921
**Client:** ERM
**Project Manager:** Paul E. Pope

## General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

| Testing Sector | Accreditation Body (Standard) | Certificate Number | Website |
|---|---|---|---|
| Environmental | ACLASS (DoD ELAP) | ADE-1420 | http://www.aclasscorp.com |
| | Utah (NELAC) | DATA1 | http://health.utah.gov/lab/labimp/ |
| | Nevada | UT00009 | http://ndep.nv.gov/bsdw/labservice.htm |
| | Oklahoma | UT00009 | http://www.deq.state.ok.us/CSDnew/ |
| | Iowa | IA# 376 | http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx |
| | Florida (TNI) | E871067 | http://www.dep.state.fl.us/labs/bars/sas/qa/ |
| | Texas (TNI) | T104704456-11-1 | http://www.tceq.texas.gov/field/qa/lab_accred_certif.html |
| Industrial Hygiene | AIHA (ISO 17025 & AIHA IHLAP/ELLAP) | 101574 | http://www.aihaaccreditedlabs.org |
| Lead Testing: | | | |
| CPSC | ACLASS (ISO 17025, CPSC) | ADE-1420 | http://www.aclasscorp.com |
| Soil, Dust, Paint ,Air | AIHA (ISO 17025, AIHA ELLAP and NLLAP) | 101574 | http://www.aihaaccreditedlabs.org |
| Dietary Supplements | ACLASS (ISO 17025) | ADE-1420 | http://www.aclasscorp.com |

## Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

## Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

# Quality Control Sample
# Batch Report

## Analysis Information

**Workorder:** 1206921

| | | |
|---|---|---|
| **Limits:** Historical/Performance | **Preparation:** NA | **Analysis:** EPA TO-15 |
| **Basis:** ALS Laboratory Group | **Batch:** NA | **Batch:** IVOA/1928 (HBN: 82903) |
| | **Prepared By:** NA | **Analyzed By:** Lisa M. Reid |

## Blank

**MB:** 265229
**Analyzed:** 03/09/2012 11:31
**Units:** ppb

| Analyte | Result | MDL | RL |
|---|---|---|---|
| Tetrachloroethene | ND | 0.15 | 0.5 |

## Laboratory Control Sample - Laboratory Control Sample Duplicate

**LCS:** 265227
**Analyzed:** 03/09/2012 09:41
**Units:** ppb

**LCSD:** 265228
**Analyzed:** 03/09/2012 10:19

| Analyte | Result | Target | % Recovery | QC Limits | | Result | RPD | QC Limits | |
|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 8.54 | 10 | 85.4 | 60.7 | 126.6 | 9.17 | 7.06 | 0 | 25 |

## Surrogate Recoveries

| Surrogate | Bromofluorobenzene | |
|---|---|---|
| QC Limits | 67.7 | 129.9 |
| Units | ppb | |

| Lab ID | Result | Target | % Recovery |
|---|---|---|---|
| 265227-LCS | 23.7 | 20 | 118 |
| 265228-LCSD | 24.2 | 20 | 121 |
| 1206920001 | 22.9 | 20 | 114 |
| 1206920002 | 22.3 | 20 | 112 |
| 1206920003 | 22.7 | 20 | 114 |
| 1206920004 | 23.2 | 20 | 116 |
| 1206920005 | 23.9 | 20 | 119 |
| 1206921001 | 23.4 | 20 | 117 |

## QC Data Approved and Reviewed by

| Lisa M. Reid | Matthew Goetz | 3/15/2012 |
|---|---|---|
| **Analyst** | **Peer Review** | **Date** |

## Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected
QC results are not adjusted for moisture correction, where applicable

L W 1204127

# Chain of Custody / Analytical Request Form

**Canada Toll Free: 1 800 668 9878**

**www.alsglobal.com**

COC # _____

1204127 Page 1 of 1

| **Report To** | | **Report Format / Distribution** | **Service Requested** (Rush for routine analysis subject to availability) |
|---|---|---|---|
| Company: | ERM-West | ☐ Standard ☐ Other | ◉ Regular (Default) |
| Contact: | Cyrus Gorman | ☑ PDF ☐ Excel ☐ Digital ☐ Fax | ○ Priority (Specify Date Required → → ) Surcharges apply |
| Address: | 1218 3rd Ave, Suite 1412 | Email 1: cyrus.gorman@erm.com | ○ Emergency (1 Business Day) - 100% Surcharge |
| | Seattle Washington, 98101 | Email 2: matt.crandell@erm.com | ○ For Emergency < 1 Day, ASAP or Weekend - Contact ALS |
| Phone: | 425-214-0468 Fax: 425-455-3573 | | |
| **Invoice To** | Same as Report ? ☐ Yes ☑ No | **Client / Project Information** | **Analysis Request** |
| Company: | ERM-West | Job #: 117205.03 | Please indicate below Filtered, Preserved or both (F, P, F/P) |
| Contact: | Accounts Payable | PO / AFE: | |
| Address: | 1277 Treat Boulevard, Suite 500 | LSD: | |
| | Walnut Creek, California 94597 | | |
| Phone: | 925-482-3213 Fax: | Quote #: | |
| Lab Work Order # (lab use only) | | **ALS Contact:** | **Sampler:** Matt Crandell |

| Sample # | Sample Identification (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | TO-15 (PCE) | Number of Containers |
|---|---|---|---|---|---|---|
| 0305 | Stk-1-020912 | 09-Feb-12 | 12:48 | Air | X | 1 |
| | | | | | | |
| | | | | | | |
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2/9/2012

**Special Instructions / Regulations / Hazardous Details**

Please include Job # on the invoice. Units: ppb and ug/m^3

**Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.**

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

**Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.**

| SHIPMENT RELEASE (client use) | | | SHIPMENT RECEPTION (lab use only) | | | | SHIPMENT VERIFICATION (lab use only) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Released by: | Date (dd-mmm-yy) | Time (hh-mm) | Received by: | Date: | Time: | Temperature: | Verified by: | Date: | Time: | Observations: Yes / No ? If Yes add SIF |
| Matt Crandell | 09-Feb-12 | 15:00 | Jessica Tessier | 09-10-12 | 10:05 | °C | | | | |

**ALS Laboratory Group**
ANALYTICAL CHEMISTRY & TESTING SERVICES

**Environmental Division**

# Canister Chain of Custody

| Client: Matt Crandell EPM | Project/Job/Task: |
|---|---|
| Account No: | |

**Please do not apply adhesive labels directly on Canisters**

**Manilla tags are provided, attached to Canisters for your convenience, to apply adhesive labels**

| Canister Serial No.: | Date Cleaned | Initial Vacuum (inches of Hg vacuum) | VFR flow rate (ml/min) | Initials: | Field Vacuum before sampling (inches of Hg vacuum) | Final Vacuum after sampling (Inches of Hg vacuum) | Client Sample Identification | Other Client Information | ALS use only |
|---|---|---|---|---|---|---|---|---|---|
| 0325 | 01-17-12 | >25 | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| VFR Serial No.: | | | | | | | | | |
| 0344 | NA | | NA | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Original Field Sample Chain-of-Custody

| Relinquished By: (Signature) | Date/Time | Received By: (Signature) | Reason for Transfer/Storage Location |
|---|---|---|---|
| | 02-07-12 1600 | | |
| | | | |
| | | | |

Return to:
ALS Laboratory Group
960 W. LeVoy Drive
Salt Lake City, UT 84123
800-356-9135

If canisters are kept for longer than the original project scheduled sampling, a $40 per can - per week rental fee will be assessed. If a project is cancelled after ALS has shipped cans, in addition to the cost of the initial shipping, a $40 weekly rental fee will be charged for each unused can until they are returned to ALS.

# ANALYTICAL REPORT

Report Date: February 14, 2012

Cyrus Gorman
ERM
1218 3rd Ave.
Suite 1412
Seattle, WA 98101

Phone: (425) 214-0468

E-mail: cyrus.gorman@erm.com

Workorder: **34-1204127**
Project ID: 117205.03 021012
Purchase Order: 117205.03

| Client Sample ID | Lab ID | Collect Date | Receive Date | Sampling Site |
|---|---|---|---|---|
| Stk-1-020912 | 1204127001 | 02/09/12 | 02/10/12 | 117205.03 |

# ANALYTICAL REPORT

**Workorder:** 34-1204127
**Client:** ERM
**Project Manager:** Paul E. Pope

## Analytical Results

| | | | |
|---|---|---|---|
| Sample ID: **Stk-1-020912** | Sampling Site: 117205.03 | Collected: 02/09/2012 |
| Lab ID: 1204127001 | Media: Summa 6 Liter Canister | Received: 02/10/2012 |
| Matrix: Air | Sampling Parameter: NA | |

**Analysis Method - EPA TO-15**

| | | |
|---|---|---|
| **Preparation:** Not Applicable | **Analysis:** EPA TO-15, Air | **Instrument ID:** 5972-W |
| | **Batch:** IVOA/1899 (HBN: 80993) | **Percent Solid:** NA |
| | **Analyzed:** 02/10/2012 19:08 | **Report Basis:** Wet |

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **270** | **1800** | 1.5 | 5.0 | **10** | E |

## Comments

**Workorder:** **1204127**

The surrogate recovery in the LCS is high, reason is unknown.

## Report Authorization

| Method | Analyst | Peer Review |
|---|---|---|
| **EPA TO-15** | Lisa M. Reid | Thomas J. Masoian |

## Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

# ANALYTICAL REPORT

**Workorder:** 34-1204127
**Client:** ERM
**Project Manager:** Paul E. Pope

## General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
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ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

| Testing Sector | Accreditation Body (Standard) | Certificate Number | Website |
|---|---|---|---|
| Environmental | ACLASS (DoD ELAP) | AT-1421 | http://www.aclasscorp.com |
| | Utah (NELAC) | DATA1 | http://health.utah.gov/lab/labimp/ |
| | Nevada | UT00009 | http://ndep.nv.gov/bsdw/labservice.htm |
| | Oklahoma | UT00009 | http://www.deq.state.ok.us/CSDnew/ |
| | Iowa | IA# 376 | http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx |
| | Florida (TNI) | E871067 | http://www.dep.state.fl.us/labs/bars/sas/qa/ |
| | Texas (TNI) | T104704456-11-1 | http://www.tceq.texas.gov/field/qa/lab_accred_certif.html |
| Industrial Hygiene | AIHA (ISO 17025 & AIHA IHLAP/ELLAP) | 101574 | http://www.aihaaccreditedlabs.org |
| Lead Testing: | | | |
| CPSC | ACLASS (ISO 17025, CPSC) | AT-1421 | http://www.aclasscorp.com |
| Soil, Dust, Paint ,Air | AIHA (ISO 17025, AIHA ELLAP and NLLAP) | 101574 | http://www.aihaaccreditedlabs.org |
| Dietary Supplements | ACLASS (ISO 17025) | AT-1421 | http://www.aclasscorp.com |

## Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

## Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

# Quality Control Sample
# Batch Report

## Analysis Information

**Workorder:** 1204127

| | | | |
|---|---|---|---|
| **Limits:** | Historical/Performance | **Preparation:** | NA |
| **Basis:** | ALS Laboratory Group | **Batch:** | NA |
| | | **Prepared By:** | NA |
| **Analysis:** | EPA TO-15 | | |
| **Batch:** | IVOA/1899 (HBN: 80993) | | |
| **Analyzed By:** | Lisa M. Reid | | |

## Blank

**MB:** 259171
**Analyzed:** 02/10/2012 11:55
**Units:** ppb

| Analyte | Result | MDL | RL |
|---|---|---|---|
| Tetrachloroethene | ND | 0.15 | 0.5 |

## Laboratory Control Sample - Laboratory Control Sample Duplicate

**LCS:** 259169
**Analyzed:** 02/10/2012 09:23
**LCSD:** 259170
**Analyzed:** 02/10/2012 10:10
**Units:** ppb

| Analyte | Result | Target | % Recovery | QC Limits | | Result | RPD | QC Limits | |
|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 10.3 | 10 | 103 | 60.7 | 126.6 | 8.22 | 22.8 | 0 | 25 |

## Surrogate Recoveries

| Surrogate | Bromofluorobenzene | |
|---|---|---|
| QC Limits | 67.7 | 129.9 |
| Units | ppb | |

| Lab ID | Result | Target | % Recovery |
|---|---|---|---|
| 259169-LCS | 27.8 | 20 | *139 |
| 259170-LCSD | 24.4 | 20 | 122 |
| 1203909001 | 23.1 | 20 | 115 |
| 1203909002 | 22.2 | 20 | 111 |
| 1204003001 | 22.6 | 20 | 113 |
| 1204003002 | 23.4 | 20 | 117 |
| 1204127001 | 21.9 | 20 | 109 |
| 1204170001 | 22.5 | 20 | 113 |
| 1204170002 | 22.8 | 20 | 114 |
| 1204170003 | 20.8 | 20 | 104 |

## QC Data Approved and Reviewed by

| Lisa M. Reid | Thomas J. Masoian | 2/14/2012 |
|---|---|---|
| **Analyst** | **Peer Review** | **Date** |

## Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
⛔ - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected
QC results are not adjusted for moisture correction, where applicable

# ANALYTICAL REPORT

Report Date: December 20, 2011

Matt Crandell
ERM
1218 3rd Ave.
Suite 1412
Seattle, WA 98199

Phone: (425) 457-9710

E-mail: matt.crandell@erm.com

Workorder: **34-1134729**
Project ID: 117205.03 121311
Purchase Order: 117205.03

| Client Sample ID | Lab ID | Collect Date | Receive Date | Sampling Site |
|---|---|---|---|---|
| SVE-2-120911 | 1134729001 | 12/12/11 | 12/13/11 | 117205.03 |
| SVE-1-120911 | 1134729002 | 12/12/11 | 12/13/11 | 117205.03 |
| SVE-3-120911 | 1134729003 | 12/12/11 | 12/13/11 | 117205.03 |
| SVE-4-120911 | 1134729004 | 12/12/11 | 12/13/11 | 117205.03 |
| SVE-5-120911 | 1134729005 | 12/12/11 | 12/13/11 | 117205.03 |
| SVE-6-120911 | 1134729006 | 12/12/11 | 12/13/11 | 117205.03 |
| SVE-7-120911 | 1134729007 | 12/12/11 | 12/13/11 | 117205.03 |
| SVE-8-120911 | 1134729008 | 12/12/11 | 12/13/11 | 117205.03 |
| SVE-9-120911 | 1134729009 | 12/12/11 | 12/13/11 | 117205.03 |
| SVE-10-120911 | 1134729010 | 12/12/11 | 12/13/11 | 117205.03 |
| Stk-1-120911 | 1134729011 | 12/12/11 | 12/13/11 | 117205.03 |

# ANALYTICAL REPORT

**Workorder:** 34-1134729
**Client:** ERM
**Project Manager:** Paul E. Pope

## Analytical Results

Sample ID: SVE-2-120911 | Sampling Site: 117205.03 | Collected: 12/12/2011
Lab ID: 1134729001 | Media: Mini Sulfur Summa | Received: 12/13/2011
Matrix: Air | Sampling Parameter: NA

**Analysis Method - EPA TO-15**

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instrument ID:** 5972-W
**Batch:** IVOA/1860 (HBN: 78501) | **Percent Solid:** NA
**Analyzed:** 12/16/2011 13:42 | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **200** | **1300** | 3.0 | 10 | **20** | |

Sample ID: SVE-1-120911 | Sampling Site: 117205.03 | Collected: 12/12/2011
Lab ID: 1134729002 | Media: Mini Sulfur Summa | Received: 12/13/2011
Matrix: Air | Sampling Parameter: NA

**Analysis Method - EPA TO-15**

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instrument ID:** 5972-W
**Batch:** IVOA/1860 (HBN: 78501) | **Percent Solid:** NA
**Analyzed:** 12/16/2011 16:41 | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **240** | **1600** | 3.0 | 10 | **20** | |

Sample ID: SVE-3-120911 | Sampling Site: 117205.03 | Collected: 12/12/2011
Lab ID: 1134729003 | Media: Mini Sulfur Summa | Received: 12/13/2011
Matrix: Air | Sampling Parameter: NA

**Analysis Method - EPA TO-15**

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instrument ID:** 5972-W
**Batch:** IVOA/1860 (HBN: 78501) | **Percent Solid:** NA
**Analyzed:** 12/16/2011 17:16 | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **370** | **2500** | 3.0 | 10 | **20** | |

Sample ID: SVE-4-120911 | Sampling Site: 117205.03 | Collected: 12/12/2011
Lab ID: 1134729004 | Media: Mini Sulfur Summa | Received: 12/13/2011
Matrix: Air | Sampling Parameter: NA

**Analysis Method - EPA TO-15**

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instrument ID:** 5972-W
**Batch:** IVOA/1860 (HBN: 78501) | **Percent Solid:** NA
**Analyzed:** 12/16/2011 17:50 | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **130** | **910** | 3.0 | 10 | **20** | |

# ANALYTICAL REPORT

**Workorder:** 34-1134729
**Client:** ERM
**Project Manager:** Paul E. Pope

## Analytical Results

Sample ID: SVE-5-120911 | Sampling Site: 117205.03 | Collected: 12/12/2011
Lab ID: 1134729005 | Media: Mini Sulfur Summa | Received: 12/13/2011
Matrix: Air | Sampling Parameter: NA

**Analysis Method - EPA TO-15**

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instrument ID:** 5972-W
**Batch:** IVOA/1860 (HBN: 78501) | **Percent Solid:** NA
**Analyzed:** 12/16/2011 18:25 | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **180** | **1200** | 3.0 | 10 | **20** | |

Sample ID: SVE-6-120911 | Sampling Site: 117205.03 | Collected: 12/12/2011
Lab ID: 1134729006 | Media: Mini Sulfur Summa | Received: 12/13/2011
Matrix: Air | Sampling Parameter: NA

**Analysis Method - EPA TO-15**

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instrument ID:** 5972-W
**Batch:** IVOA/1860 (HBN: 78501) | **Percent Solid:** NA
**Analyzed:** 12/16/2011 19:00 | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **430** | **2900** | 3.0 | 10 | **20** | E |

Sample ID: SVE-7-120911 | Sampling Site: 117205.03 | Collected: 12/12/2011
Lab ID: 1134729007 | Media: Mini Sulfur Summa | Received: 12/13/2011
Matrix: Air | Sampling Parameter: NA

**Analysis Method - EPA TO-15**

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instrument ID:** 5972-W
**Batch:** IVOA/1860 (HBN: 78501) | **Percent Solid:** NA
**Analyzed:** 12/16/2011 19:35 | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **210** | **1400** | 3.0 | 10 | **20** | |

Sample ID: SVE-8-120911 | Sampling Site: 117205.03 | Collected: 12/12/2011
Lab ID: 1134729008 | Media: Mini Sulfur Summa | Received: 12/13/2011
Matrix: Air | Sampling Parameter: NA

**Analysis Method - EPA TO-15**

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instrument ID:** 5972-W
**Batch:** IVOA/1861 (HBN: 78502) | **Percent Solid:** NA
**Analyzed:** 12/19/2011 12:17 | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **0.81** | **5.5** | 0.15 | 0.50 | **1** | |

# ANALYTICAL REPORT

**Workorder:** 34-1134729
**Client:** ERM
**Project Manager:** Paul E. Pope

## Analytical Results

Sample ID: **SVE-9-120911** | Sampling Site: 117205.03 | Collected: 12/12/2011
Lab ID: 1134729009 | Media: Mini Sulfur Summa | Received: 12/13/2011
Matrix: Air | Sampling Parameter: NA

**Analysis Method - EPA TO-15**

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instrument ID:** 5972-W
**Batch:** IVOA/1860 (HBN: 78501) | **Percent Solid:** NA
**Analyzed:** 12/16/2011 20:45 | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **110** | **750** | 3.0 | 10 | **20** | |

Sample ID: **SVE-10-120911** | Sampling Site: 117205.03 | Collected: 12/12/2011
Lab ID: 1134729010 | Media: Mini Sulfur Summa | Received: 12/13/2011
Matrix: Air | Sampling Parameter: NA

**Analysis Method - EPA TO-15**

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instrument ID:** 5972-W
**Batch:** IVOA/1860 (HBN: 78501) | **Percent Solid:** NA
**Analyzed:** 12/16/2011 21:20 | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **190** | **1300** | 3.0 | 10 | **20** | |

Sample ID: **Stk-1-120911** | Sampling Site: 117205.03 | Collected: 12/12/2011
Lab ID: 1134729011 | Media: Mini Sulfur Summa | Received: 12/13/2011
Matrix: Air | Sampling Parameter: NA

**Analysis Method - EPA TO-15**

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air | **Instrument ID:** 5972-W
**Batch:** IVOA/1861 (HBN: 78502) | **Percent Solid:** NA
**Analyzed:** 12/19/2011 12:55 | **Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | ND | <1.0 | 0.15 | 0.50 | **1** | U |

## Report Authorization

**Analysis Method - EPA TO-15**

Lisa M. Reid — **Analyst**
Thomas J. Masoian — **Peer Review**

## Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

# ANALYTICAL REPORT

**Workorder:** 34-1134729
**Client:** ERM
**Project Manager:** Paul E. Pope

## General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

| Testing Sector | Accreditation Body (Standard) | Certificate Number | Website |
|---|---|---|---|
| Environmental | ACLASS (DoD ELAP) | AT-1421 | http://www.aclasscorp.com |
| | Utah (NELAC) | DATA1 | http://health.utah.gov/lab/labimp/ |
| | Nevada | UT00009 | http://ndep.nv.gov/bsdw/labservice.htm |
| | Oklahoma | UT00009 | http://www.deq.state.ok.us/CSDnew/ |
| | Iowa | IA# 376 | http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx |
| | Florida (TNI) | E871067 | http://www.dep.state.fl.us/labs/bars/sas/qa/ |
| | Texas (TNI) | T104704456-11-1 | http://www.tceq.texas.gov/field/qa/lab_accred_certif.html |
| Industrial Hygiene | AIHA (ISO 17025 & AIHA IHLAP/ELLAP) | 101574 | http://www.aihaaccreditedlabs.org |
| Lead Testing: | | | |
| CPSC | ACLASS (ISO 17025, CPSC) | AT-1421 | http://www.aclasscorp.com |
| Soil, Dust, Paint ,Air | AIHA (ISO 17025, AIHA ELLAP and NLLAP) | 101574 | http://www.aihaaccreditedlabs.org |
| Dietary Supplements | ACLASS (ISO 17025) | AT-1421 | http://www.aclasscorp.com |

## Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

## Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

# ANALYTICAL REPORT

Report Date: December 27, 2011

Matt Crandell
ERM
1218 3rd Ave.
Suite 1412
Seattle, WA 98199

Phone: (425) 457-9710

E-mail: matt.crandell@erm.com

Workorder: **34-1135415**
Project ID: 117205.03 122011
Purchase Order: 117205.03

| Client Sample ID | Lab ID | Collect Date | Receive Date | Sampling Site |
|---|---|---|---|---|
| Stk-1-121611 | 1135415001 | 12/16/11 | 12/20/11 | 117205.03 |

# ANALYTICAL REPORT

**Workorder:** 34-1135415
**Client:** ERM
**Project Manager:** Paul E. Pope

## Analytical Results

Sample ID: Stk-1-121611 | Sampling Site: 117205.03 | Collected: 12/16/2011
Lab ID: 1135415001 | Media: Summa 6 Liter Canister | Received: 12/20/2011
Matrix: Air | Sampling Parameter: NA

**Analysis Method - EPA TO-15**

**Preparation:** Not Applicable
**Analysis:** EPA TO-15, Air
**Batch:** IVOA/1866 (HBN: 78692)
**Analyzed:** 12/21/2011 22:33
**Instrument ID:** 5972-W
**Percent Solid:** NA
**Report Basis:** Wet

| Analyte | ppb | ug/m³ | MDL (ppb) | RL (ppb) | Dilution | Qual. |
|---|---|---|---|---|---|---|
| Tetrachloroethene | **190** | **1300** | 1.5 | 5.0 | **10** | |

## Report Authorization

**Analysis Method - EPA TO-15**

Lisa M. Reid — **Analyst**
Thomas J. Masoian — **Peer Review**

## Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

# ANALYTICAL REPORT

**Workorder:** 34-1135415
**Client:** ERM
**Project Manager:** Paul E. Pope

## General Lab Comments

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| Environmental | ACLASS (DoD ELAP) | AT-1421 | http://www.aclasscorp.com |
| | Utah (NELAC) | DATA1 | http://health.utah.gov/lab/labimp/ |
| | Nevada | UT00009 | http://ndep.nv.gov/bsdw/labservice.htm |
| | Oklahoma | UT00009 | http://www.deq.state.ok.us/CSDnew/ |
| | Iowa | IA# 376 | http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx |
| | Florida (TNI) | E871067 | http://www.dep.state.fl.us/labs/bars/sas/qa/ |
| | Texas (TNI) | T104704456-11-1 | http://www.tceq.texas.gov/field/qa/lab_accred_certif.html |
| Industrial Hygiene | AIHA (ISO 17025 & AIHA IHLAP/ELLAP) | 101574 | http://www.aihaaccreditedlabs.org |
| Lead Testing: | | | |
| CPSC | ACLASS (ISO 17025, CPSC) | AT-1421 | http://www.aclasscorp.com |
| Soil, Dust, Paint ,Air | AIHA (ISO 17025, AIHA ELLAP and NLLAP) | 101574 | http://www.aihaaccreditedlabs.org |
| Dietary Supplements | ACLASS (ISO 17025) | AT-1421 | http://www.aclasscorp.com |

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CRDL = Contract Required Detection Limit
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ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

## Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

*Attachment C*
*System Monitoring Data Spreadsheets*

*Table C-1*

*System Effluent Monitoring*
*MVSC/Harris Properties SVE System*
*Normandy Park, WA*

| Date | Operating Well Group/ SVE Wells | Time | Differential Pressure (inches H2O) | Vacuum (inches H2O) | Temp (deg F) | PID ppm | PCE Result ppbv | PCE Result ug/m3 |
|---|---|---|---|---|---|---|---|---|
| 8-Sep-09 | A | 1224 | 3.8 | NM | 99 | 15.4 | 11,000 | 74,000 |
| 10-Sep-09 | A | 1144 | 3.8 | NM | 117 | 12.1 | 10,000 | 69,000 |
| 14-Sep-09 | A | 1216 | NM | 9 | 100 | 8.5 | 1,300 | 8,500 |
| 18-Sep-09 | A | 915 | NM | 10 | 94 | 5.4 | 8,000 | 54,000 |
| 25-Sep-09 | A | 1604 | 4 | 10.3 | 111 | 4.1 | 2,600 | 18,000 |
| 2-Oct-09 | A | 1511 | 4.1 | 8.5 | 97 | 4.4 | 3,700 | 25,000 |
| 10-Nov-09 | B | 930 | 4.1 | 16 | 85 | 1.1 | 1,200 | 8,100 |
| 10-Dec-09 | A | 1038 | 4.6 | 15 | 59 | 1.1 | 800 | 5,500 |
| 10-Dec-09 | B | 1350 | NS | NS | NS | NS | 870 | 5,900 |
| 11-Jan-09 | B | 1202 | 4.2 | 25 | 86 | 0.9 | 830 | 5,700 |
| 11-Jan-09 | A | 1240 | NS | NS | NS | NS | 240 | 1,600 |
| 8-Feb-10 | A | 1130 | 4.3 | 17 | 85 | 1.3 | 610 | 4,100 |
| 8-Feb-10 | B | 1210 | NS | NS | NS | NS | 670 | 4,600 |
| 8-Mar-10 | B | 1010 | 4.2 | 23 | 83 | 0.7 | 860 | 5,800 |
| 8-Mar-10 | A | 1056 | NS | NS | NS | NS | 190 | 1,300 |
| 5-Apr-10 | A | 1207 | 4.4 | 17.5 | 88 | 0.1 | 730 | 5,000 |
| 5-Apr-10 | B | 1238 | NS | NS | NS | NS | 190 | 1,300 |
| 6-May-10 | B | 1207 | 4.4 | 17.5 | 88 | 0.1 | 140 | 960 |
| 6-May-10 | A | 1238 | NS | NS | NS | NS | 940 | 6,400 |
| 4-Jun-10 | A | 1027 | 4.2 | 11 | 92 | 23.2 | 480 | 3,300 |
| 4-Jun-10 | B | 1223 | NS | NS | NS | NS | 400 | 2,700 |
| 9-Jul-10 | B | 1005 | 4.1 | 15 | 104 | 0.8 | 110 | 750 |
| 9-Jul-10 | A | 1121 | NS | NS | NS | NS | 180 | 1200 |
| 6-Aug-10 | A | 1100 | 4.1 | 10 | 98 | 0.9 | 900 | 6,100 |
| 6-Aug-10 | B | 1211 | NS | NS | NS | NS | 520 | 3,500 |
| 7-Sep-10 | B | 1030 | 4.1 | 14.5 | 100 | 1.4 | 590 | 4,000 |
| 7-Sep-10 | A | 1141 | NS | NS | NS | NS | 270 | 1,800 |
| 5-Oct-10 | A | 1135 | 4 | 11 | 90 | 22.9 | 610 | 4,100 |
| 5-Oct-10 | B | 1246 | NS | NS | NS | NS | 280 | 1,900 |
| 1-Nov-10 | B | 1500 | 4.4 | 18 | 90 | 0.1 | 320 | 2,100 |

*Table C-1*

*System Effluent Monitoring*
*MVSC/Harris Properties SVE System*
*Normandy Park, WA*

| Date | Operating Well Group/ SVE Wells | Time | Differential Pressure (inches H2O) | Vacuum (inches H2O) | Temp (deg F) | PID ppm | PCE Result ppbv | ug/m3 |
|---|---|---|---|---|---|---|---|---|
| 1-Nov-10 | C | 1615 | NS | NS | NS | NS | 260 | 1,800 |
| 6-Dec-10 | C | 1108 | 4.6 | 16 | 84 | 0.2 | 360 | 2,400 |
| 6-Dec-10 | D | 1211 | NS | NS | NS | NS | 380 | 2,600 |
| 5-Jan-11 | D | 1112 | 4 | 25 | 84 | 0.9 | 440 | 3,000 |
| 5-Jan-11 | E | 1222 | NS | NS | NS | NS | 250 | 1,700 |
| 26-Jan-11 | E | 955 | 4.6 | 18 | 84 | 0.8 | 260 | 1,800 |
| 26-Jan-11 | F | 1603 | NS | NS | NS | NS | 330 | 2,300 |
| 9-Mar-11 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-8 | 1035 | 4.1 | 14 | 84 | 1.0 | 350 | 2,400 |
| 9-Mar-11 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | 1149 | NS | NS | NS | NS | 320 | 2,200 |
| 11-Apr-11 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | 1640 | 4.4 | 18 | 86 | 0.9 | 210 | 1,400 |
| 11-Apr-11 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | 1730 | NS | NS | NS | NS | 160 | 1,100 |
| 9-May-11 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | 1142 | 4.2 | 14 | 86 | 1.1 | 240 | 1,600 |
| 9-May-11 | SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | 1255 | NS | NS | NS | NS | 220 | 1,500 |
| 8-Jun-11 | SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | 1038 | 4.25 | 16 | 92 | 0.1 | 320 | 2,200 |
| 8-Jun-11 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7, and SVE-10 | 1152 | NS | NS | NS | NS | 320 | 2,200 |
| 6-Jul-11 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7, and SVE-10 | 1026 | 4.3 | 14 | 100 | 1.0 | 200 | 1,400 |
| 6-Jul-11 | SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | 1144 | NS | NS | NS | NS | 190 | 1,300 |
| 9-Aug-11 | SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | 1240 | 4.1 | 13 | 105 | 0.9 | 340 | 2,300 |
| 9-Aug-11 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7, and SVE-10 | 1358 | NS | NS | NS | NS | 300 | 2,000 |
| 9-Dec-11 | SVE-1, SVE-2, SVE-3, SVE-4, SVE-5, SVE-6, SVE-7, SVE-8, SVE-9, SVE-10 | 1025 | 4.1 | 11 | 80 | 0.1 | 190* | 1300* |
| 9-Feb-12 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7, and SVE-10 | 1248 | 4 | 14 | 86 | 0.3 | 270 | 1,800 |
| 8-Mar-12 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | 1115 | 4 | 16 | 86 | 0.2 | 200 | 1,400 |

**Note:**
* = Sample collected on 12/16/11 due to defective SUMA canister
NM - not measured due to field oversight
NS = Not sampled; the additional effluent sample was collected from the indicated Well Group

*Table C-2*

*Selected Groundwater Elevation Data*
*November 2010 through March 2012*
*MVSC/Harris Properties SVE System*
*Normandy Park, WA*

| Monitoring Well | Screened Interval (feet bgs) [1] | Well Elevation (TOC feet msl) | Date | Depth to Groundwater (feet TOC) [3] | Top of Screen (feet bgs) | Exposed Screen Length (feet) | Groundwater Elevation (feet msl) [4] |
|---|---|---|---|---|---|---|---|
| MW-2 | 33-43 | NA | 11/5/2010 | 37.03 | 33 | 4.03 | NM |
| | | | 2/11/2011 | 35.81 | | 2.81 | |
| MW-10 | 32-42 | 302.70 | 2/11/2011 | 34.04 | 32.00 | 2.04 | 268.66 |
| MW-11 | 32-42 | 303.63 | 2/11/2011 | 35.01 | 32.00 | 3.01 | 268.62 |
| KMW-2 | 30-40 | 306.9 [2] | 11/5/2010 | 35.65 | 30 | 5.65 | 271.25 |
| | | | 2/11/2011 | 34.32 | | 4.32 | 272.58 |
| KMW-3 | 25-35 | 296.92 [2] | 11/5/2010 | 26.37 | 25 | 1.37 | 270.55 |
| | | | 2/11/2011 | NM | | - | - |
| DC-1 | 40-45 | 312.72 | 11/5/2010 | 40.64 | 40 | 0.64 | 272.08 |
| | | | 2/11/2011 | 39.37 | | 0.00 | 273.35 |
| | | | 3/9/2011 | 39.10 | | 0.00 | 273.62 |
| | | | 4/11/2011 | 38.50 | | 0.00 | 274.22 |
| | | | 5/9/2011 | 38.09 | | 0.00 | 274.63 |
| | | | 6/8/2011 | 37.91 | | 0.00 | 274.81 |
| | | | 7/6/2011 | 38.50 | | 0.00 | 274.22 |
| | | | 8/9/2011 | 38.43 | | 0.00 | 274.29 |
| | | | 9/15/2011 | 38.91 | | 0.00 | 273.81 |
| | | | 12/9/2011 | 39.92 | | 0.00 | 272.80 |
| | | | 2/9/2012 | 40.14 | | 0.14 | 272.58 |
| | | | 3/8/2012 | 40.05 | | 0.05 | 272.67 |
| DC-2 | 42-47 | 313.04 | 8/21/2008 | 41.65 | 42 | 0 | 271.39 |
| | | | 11/5/2010 | 41.34 | | 0 | 271.70 |
| | | | 2/11/2011 | 40.08 | | 0 | 272.96 |
| DC-3 | 43-48 | 313.23 | 11/5/2010 | 41.58 | 43 | 0 | 271.65 |
| | | | 2/11/2011 | 40.30 | | 0 | 272.93 |
| DC-4 | 44-49 | 312.12 | 11/5/2010 | 40.81 | 44 | 0 | 271.31 |
| | | | 2/11/2011 | 39.51 | | 0 | 272.61 |
| DC-7 | 35-40 | 302.78 | 11/5/2010 | 32.15 | 35 | 0 | 270.63 |
| | | | 2/11/2011 | 30.91 | | 0 | 271.87 |
| DC-8 | 37-42 | 306.38 | 11/5/2010 | 35.69 | 37 | 0 | 270.69 |
| | | | 2/11/2011 | 34.49 | | 0 | 271.89 |
| DC-10B | 45-50 | 307.89 | 11/5/2010 | 36.40 | 45 | 0 | 271.49 |
| | | | 2/11/2011 | 35.06 | | 0 | 272.83 |
| DC-11 | 32-42 | 311.02 [2] | 11/5/2010 | 39.59 | 32 | 7.59 | 271.43 |
| | | | 2/11/2011 | 38.36 | | 6.36 | 272.66 |
| DC-12 | 32-42 | 310.9 [2] | 11/5/2010 | 39.79 | 32 | 7.79 | 271.11 |
| | | | 2/11/2011 | 38.60 | | 6.60 | 272.30 |
| DC-13 | 32-42 | 310.85 [2] | 11/5/2010 | 38.88 | 32 | 6.88 | 271.97 |
| | | | 2/11/2011 | 37.68 | | 5.68 | 273.17 |
| DC-14 | 35-45 | 308.6 [2] | 11/5/2010 | 38.34 | 35 | 3.34 | 270.26 |
| | | | 2/11/2011 | 37.18 | | 2.18 | 271.42 |
| DC-15 | 31-41 | 307.54 [2] | 11/5/2010 | 36.93 | 31 | 5.93 | 270.61 |
| | | | 2/11/2011 | 35.68 | | 4.68 | 271.86 |
| DC-16 | 50-60 | 307.12 [2] | 11/5/2010 | 36.10 | 50 | 0 | 271.02 |
| | | | 2/11/2011 | 34.85 | | 0 | 272.27 |
| DC-17 | 30-40 | 304.89 [2] | 11/5/2010 | 34.86 | 30 | 4.86 | 270.03 |
| | | | 2/11/2011 | 33.59 | | 3.59 | 271.30 |

**Notes:**

amsl = Above mean sea level

bgs = Below ground surface

NA = Not applicable

NM = Not measured

- = Where depth to groundwater was not recorded, it was not possible to calculate the length of the exposed screen

[1] Screened interval in feet below ground surface (bgs).

[2] Surveyed/calculated elevation relative to mean sea level (msl) of monitoring well top of casing (TOC) based on survey conducted by Bush Roed & Hitchings, Inc., May 2007. Survey datum is North American Vertical Datum of 1988 (NAVD 88).

[3] Depth to groundwater measured in feet below top of casing (TOC).

[4] Groundwater elevation in feet above mean sea level.

*Table C-3*
*Vacuum Readings*
*MVSC/Harris Properties SVE System*
*Normandy Park, WA*

| Probe/Well Date | Operating Well Group/SVE Wells | VMP-1 | VMP-2 | VMP-3 | VMP-4 | VMP-5 | VMP-6 | DC-1 | DC-19 |
|---|---|---|---|---|---|---|---|---|---|
| 8-Sep-09 | A | 0.01 | 0.31 | 0.28 | 0.22 | 0.16 | 0.8 | 0.27 | 0.5 |
| 10-Sep-09 | A | 0.04 | 0.32 | 0.28 | 1.1 | 0.18 | 1.2 | 0.33 | 0.58 |
| 14-Sep-09 | A | 0.04 | 0.32 | 0.25 | 1.1 | 0.19 | 1.2 | 0.32 | 0.56 |
| 18-Sep-09 | A | 0.01 | 0.34 | 0.25 | 1.1 | 0.18 | 1.2 | 0.26 | 0.45 |
| 25-Sep-09 | A | 0.01 | 0.33 | 0.27 | 1.15 | 0.14 | 1.2 | 0.26 | 0.53 |
| 2-Oct-09 | A | 0.01 | 0.32 | 0.24 | 1.1 | 0.26 | 1.2 | 0.28 | 0.55 |
| 10-Nov-09 | B | 0.03 | 0.28 | 0.5 | 0.4 | 0.7 | 0.5 | 0.28 | 0.38 |
| 10-Dec-09 | A | * | 0.35 | 0.28 | 1.2 | 0.26 | 1.6 | 0.29 | 0.5 |
| 11-Jan-10 | B | 0 | 0.43 | 0.59 | 0.26 | 0.63 | 0.56 | 0.2 | 0.42 |
| 8-Feb-10 | A | 0.04 | 0.42 | 0.13 | 0.18 | 0.12 | 1.2 | 0.36 | 0.81 |
| 8-Mar-10 | B | 0.03 | 0.4 | 0.6 | 0.17 | 0.27 | 0.59 | 0.39 | 0.58 |
| 5-Apr-10 | A | 0.01 | 0.44 | 0.23 | 1 | 0.24 | 1.4 | 0.05 | 0.89 |
| 6-May-10 | B | 0.1 | 0.35 | 0.49 | 0.3 | 0.61 | 0.52 | 0 | 0.36 |
| 4-Jun-10 | A | 0.07 | 0.19 | 0.4 | 1.4 | 0.28 | 1.5 | 0 | 0.76 |
| 9-Jul-10 | B | 0.01 | 0.34 | 0.48 | 0.3 | 0.53 | 0.45 | 0.005 | 0.4 |
| 6-Aug-10 | A | 0.04 | 0.3 | 0.28 | 1 | 0.2 | 1.4 | 0 | 0.56 |
| 7-Sep-10 | B | 0.04 | 0.32 | 0.43 | 0.32 | 0.46 | 0.39 | 0 | 0.34 |
| 5-Oct-10 | A | 0.015 | 0.34 | 0.28 | 0.93 | 0.2 | 1.2 | 0.34 | 0.58 |
| 1-Nov-10 | B | 0 | 0.37 | 0.49 | 0.5 | 0.62 | 0.52 | 0.46 | 0.66 |
| 6-Dec-10 | C | 0.06 | 0.51 | 0.34 | 0.18 | 0.28 | 2 | 0.45 | 0.43 |
| 5-Jan-11 | D | 0.07 | 0.86 | 1.2 | 2.6 | 0.84 | 0.36 | 0.01 | 0.06 |
| 26-Jan-11 | E | 0.005 | 0.12 | 0.04 | 0.16 | 0.32 | 2.4 | 0 | 0.9 |
| 9-Mar-11 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | 0.08 | 0.42 | 0.40 | 1.6 | 0.46 | 2.0 | 0 | 0.54 |
| 11-Apr-11 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | 0.05 | 0.43 | 0.82 | 1.8 | 0.41 | 2.1 | 0 | 0.38 |
| 9-May-11 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | 0.01 | 0.44 | 0.36 | 1.4 | 0.33 | 1.7 | 0 | 0.32 |
| 8-Jun-11 | SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | 0.02 | 0.52 | 0.62 | 1.4 | 0.32 | 1.6 | 0 | 0.26 |
| 6-Jul-11 | SVE-2, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | 0.01 | 0.28 | 0.56 | 1.3 | 0.28 | 1.4 | 0 | 0.28 |
| 9-Aug-11 | SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, SVE-7 | 0.02 | 0.47 | 0.53 | 1.2 | 0.26 | 1.5 | 0 | 0.24 |
| 9-Dec-11 | SVE-1, SVE-2, SVE-3, , SVE-4, SVE-5, SVE-6, SVE-7, SVE-8, SVE-9, SVE-10 | 0 | 0.28 | 0.36 | 1.2 | 0.5 | 1.0 | 0 | 0.49 |
| 9-Feb-12 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | 0.04 | 0.49 | 0.43 | 1.6 | 0.43 | 1.8 | 0 | 0.4 |
| 8-Mar-12 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | 0.004 | 0.44 | 0.43 | 1.7 | 0.42 | 1.9 | 0 | 0.30 |

Note:
Vacuum readings in inches of water
* = Could not be sampled due to ice in the well casing

*Table C-4*
*Wellhead Monitoring*
*MVSC/Harris Properties SVE System*
*Normandy Park, WA*

**Wellhead Operating Group**: C
**Date**: 12/6/2010

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vacuum | 1840 | 2.6 | 57.6 | 0.10 | 0.06 |
| SVE-2 | Vacuum | 1190 | 4.0 | 58.8 | 0.30 | 0.17 |
| SVE-3 | Vent | - | 0.29 | - | - | - |
| SVE-4 | Vent | - | 0.58 | - | - | - |
| SVE-5 | Vacuum | 3540 | 10 | 51.2 | 0.10 | 0.06 |
| SVE-6 | Vacuum | 7350 | 11 | 48.4 | 0.40 | 0.23 |
| SVE-7 | Vacuum | 4520 | 12 | 47.4 | 0.0 | 0.00 |
| SVE-8 | Vent | - | 1.5 | - | - | - |
| SVE-9 | Vent | - | 0.52 | - | - | - |
| SVE-10 | Vacuum | 1820 | 5.0 | 51 | 0.0 | 0.00 |

**Wellhead Operating Group**: D
**Date**: 1/5/2011

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vacuum | 1270 | 3.75 | 57.1 | 1.2 | 0.68 |
| SVE-2 | Vacuum | 1720 | 6 | 57.2 | 1.2 | 0.68 |
| SVE-3 | Vacuum | 3690 | 13.5 | 46.5 | 1.2 | 0.68 |
| SVE-4 | Vacuum | 3820 | 14 | 42.2 | 1.2 | 0.68 |
| SVE-5 | Vent | - | 0.59 | - | - | - |
| SVE-6 | Vacuum | 8250 | 18.5 | 44.0 | 1.6 | 0.91 |
| SVE-7 | Vent | - | 0.22 | - | - | - |
| SVE-8 | Vent | - | 0.12 | - | - | - |
| SVE-9 | Vent | - | 0.060 | - | - | - |
| SVE-10 | Vent | - | 0.060 | - | - | - |

**Wellhead Operating Group**: E
**Date**: 1/26/2011

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vent | - | 0.025 | - | - | - |
| SVE-2 | Vent | - | 0.065 | - | - | - |
| SVE-3 | Vent | - | 0.060 | - | - | - |
| SVE-4 | Vent | - | 0.48 | - | - | - |
| SVE-5 | Vacuum | 3010 | 10 | 48.3 | 1.0 | 0.57 |
| SVE-6 | Vacuum | 6200 | 14 | 44.5 | 0.90 | 0.51 |
| SVE-7 | Vacuum | 4200 | 13 | 48.5 | 0.50 | 0.29 |
| SVE-8 | Vent | - | 2.0 | - | - | - |
| SVE-9 | Vacuum | 3240 | 13.5 | 49.2 | 0.40 | 0.23 |
| SVE-10 | Vacuum | 1700 | 6.0 | 48.5 | 0.30 | 0.17 |

*Table C-4*
*Wellhead Monitoring*
*MVSC/Harris Properties SVE System*
*Normandy Park, WA*

**Wellhead Operating Group**: SVE-1-SVE-3, SVE-5, SVE-6, SVE-7, SVE-8
**Date**: 3/9/11

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vacuum | 1220 | 3 | 53.5 | 0.9 | 0.51 |
| SVE-2 | Vent | - | 0.44 | - | - | - |
| SVE-3 | Vacuum | 2400 | 7.5 | 49.3 | 0.4 | 0.23 |
| SVE-4 | Vent | - | 0.84 | - | - | - |
| SVE-5 | Vacuum | 2380 | 8.0 | 50.3 | 0.9 | 0.51 |
| SVE-6 | Vacuum | 5100 | 9.5 | 47.1 | 1.1 | 0.63 |
| SVE-7 | Vacuum | 2910 | 10.5 | 51.2 | 0.60 | 0.34 |
| SVE-8 | Vacuum | 2890 | 8.0 | 51.7 | 0.60 | 0.34 |
| SVE-9 | Vent | - | 0.26 | - | - | - |
| SVE-10 | Vent | - | 0.38 | - | - | - |

**Wellhead Operating Group**: SVE-2, SVE-3, SVE-5, SVE-6, SVE-7
**Date**: 4/11/11

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vent | - | 0.36 | - | - | - |
| SVE-2 | Vacuum | 2400 | 6.5 | 54.8 | 1.6 | 0.91 |
| SVE-3 | Vacuum | 2470 | 10.0 | 51.8 | 0.6 | 0.34 |
| SVE-4 | Vent | - | 1.8 | - | - | - |
| SVE-5 | Vacuum | 2230 | 12.0 | 52.2 | 0.7 | 0.40 |
| SVE-6 | Vacuum | 2920 | 14 | 50.4 | 1.2 | 0.68 |
| SVE-7 | Vacuum | 4200 | 16.0 | 53.9 | 0.90 | 0.51 |
| SVE-8 | Vent | - | 1.1 | - | - | - |
| SVE-9 | Vent | - | 0.36 | - | - | - |
| SVE-10 | Vent | - | 0.38 | - | - | - |

**Wellhead Operating Group**: SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10
**Date**: 5/9/11

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vacuum | 1740 | 3.7 | 55.7 | 1.0 | - |
| SVE-2 | Vent | - | 0.45 | - | - | - |
| SVE-3 | Vacuum | 2290 | 8.0 | 50.5 | 0.3 | 0.17 |
| SVE-4 | Vent | - | 0.7 | - | - | - |
| SVE-5 | Vacuum | 3610 | 9.0 | 49.9 | 0.8 | 0.46 |
| SVE-6 | Vacuum | 6500 | 10 | 48.8 | 1.5 | 0.86 |
| SVE-7 | Vacuum | 6150 | 10.5 | 50.2 | 2.1 | 1.20 |
| SVE-8 | Vent | - | 1.0 | - | - | - |
| SVE-9 | Vent | - | 0.39 | - | - | - |
| SVE-10 | Vacuum | 4630 | 3.8 | 52 | 0.90 | 0.51 |

**Wellhead Operating Group**: SVE-1, SVE-2, SVE-3, SVE-4, SVE-5, SVE-6, SVE-7
**Date**: 6/8/11

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vacuum | 1440 | 2.5 | 56.4 | 0.0 | 0.00 |
| SVE-2 | Vacuum | 1240 | 3.3 | 56.6 | 0.0 | 0.00 |
| SVE-3 | Vacuum | 2110 | 7.0 | 53.5 | 0.0 | 0.00 |
| SVE-4 | Vent | - | 0.74 | - | - | - |
| SVE-5 | Vacuum | 2220 | 8.0 | 52.2 | 0.0 | 0.00 |
| SVE-6 | Vacuum | 4080 | 9 | 53.4 | 0.2 | 0.11 |
| SVE-7 | Vacuum | 3090 | 10.0 | 50.7 | 0.0 | 0.00 |
| SVE-8 | Vent | - | 0.9 | - | - | - |
| SVE-9 | Vent | - | 0.29 | - | - | - |
| SVE-10 | Vent | - | 0.32 | - | - | - |

**Wellhead Operating Group**: SVE-2, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10
**Date**: 7/6/11

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vent | - | 0.2 | - | - | - |
| SVE-2 | Vacuum | 2100 | 4.5 | 69 | 0.9 | 0.40 |
| SVE-3 | Vacuum | 2790 | 7.0 | 64.0 | 0.7 | 0.40 |
| SVE-4 | Vent | - | 0.64 | 65.6 | - | - |
| SVE-5 | Vacuum | 2430 | 7.5 | 64.9 | 1.9 | 1.08 |
| SVE-6 | Vacuum | 3220 | 8 | 59.8 | 2.5 | 1.43 |
| SVE-7 | Vacuum | 3590 | 9.0 | 50.7 | 0.6 | 0.34 |
| SVE-8 | Vent | - | 0.9 | - | - | - |
| SVE-9 | Vent | - | 0.37 | - | - | - |
| SVE-10 | Vacuum | 3110 | 4.2 | 68.2 | 0.50 | 0.29 |

**Wellhead Operating Group**: SVE-1, SVE-2, SVE-3, SVE-5, SVE-6, SVE-7
**Date**: 8/9/11

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vacuum | 1180 | 2.4 | 69.9 | 0.3 | - |
| SVE-2 | Vacuum | 1390 | 3.1 | 72.2 | 0.5 | 0.29 |
| SVE-3 | Vacuum | 3170 | 7.0 | 65.6 | 0.5 | 0.29 |
| SVE-4 | Vent | - | 0.70 | - | - | - |
| SVE-5 | Vacuum | 3740 | 8.0 | 69.1 | 0.6 | 0.34 |
| SVE-6 | Vacuum | 3900 | 9.0 | 61.1 | 1.5 | 0.86 |
| SVE-7 | Vacuum | 4010 | 10.0 | 66.0 | 0.6 | 0.34 |
| SVE-8 | Vent | - | 0.90 | - | - | - |
| SVE-9 | Vent | - | 0.26 | - | - | - |
| SVE-10 | Vent | - | 0.14 | - | - | - |

**Wellhead Operating Group**: SVE-2, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10
**Date**: 9/15/11

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vent | - | 0.24 | - | - | - |
| SVE-2 | Vacuum | 1580 | 5.0 | 64.9 | 0.6 | 0.34 |
| SVE-3 | Vacuum | 2890 | 7.0 | 65.5 | 0.8 | 0.46 |
| SVE-4 | Vent | - | 0.54 | - | - | - |
| SVE-5 | Vacuum | 3380 | 7.0 | 60.7 | 0.4 | 0.23 |
| SVE-6 | Vacuum | 2070 | 8.0 | 62.4 | 1.4 | 0.80 |
| SVE-7 | Vacuum | 8500 | 7.5 | 63.7 | 0.5 | 0.29 |
| SVE-8 | Vent | - | 1.0 | - | - | - |
| SVE-9 | Vent | - | 0.08 | - | - | - |
| SVE-10 | Vacuum | 1600 | 4.0 | 63.4 | 0.50 | 0.29 |

**Wellhead Operating Group**: SVE-1, SVE-2, SVE-3, SVE-4, SVE-5, SVE-6, SVE-7, SVE-8, SVE-9, SVE-10
**Date**: 12/9/11

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vacuum | 1660 | 1.0 | 40.2 | 0.0 | 0.00 |
| SVE-2 | Vacuum | 3390 | 2.0 | 46.7 | 0.0 | 0.00 |
| SVE-3 | Vacuum | 1300 | 4.4 | 48.3 | 0.4 | 0.23 |
| SVE-4 | Vacuum | 1200 | 4.3 | 39.7 | 0.7 | 0.40 |
| SVE-5 | Vacuum | 1760 | 4.0 | 37.9 | 0.7 | 0.40 |
| SVE-6 | Vacuum | 5000 | 5.2 | 43.3 | 0.8 | 0.46 |
| SVE-7 | Vacuum | 2810 | 7.0 | 41.0 | 0.4 | 0.23 |
| SVE-8 | Vacuum | 3750 | 4.0 | 38.0 | 0.0 | 0.00 |
| SVE-9 | Vacuum | 2330 | 5.2 | 38.8 | 0.2 | 0.11 |
| SVE-10 | Vacuum | 680 | 0.4 | 42.2 | 0.0 | 0.00 |

**Wellhead Operating Group**: SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10

**Date**: 2/9/2012

*Table C-4*
*Wellhead Monitoring*
*MVSC/Harris Properties SVE System*
*Normandy Park, WA*

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vacuum | 1680 | 3.8 | 50 | 0.4 | 0.23 |
| SVE-2 | Vent | - | 0.6 | - | - | - |
| SVE-3 | Vacuum | 3910 | 9.0 | 51.3 | 0.0 | 0.00 |
| SVE-4 | Vent | - | 0.9 | - | - | - |
| SVE-5 | Vacuum | 3400 | 10.0 | 50.7 | 0.2 | 0.11 |
| SVE-6 | Vacuum | 8900 | 11.5 | 48.1 | 0.4 | 0.23 |
| SVE-7 | Vacuum | 5900 | 12.5 | 52.6 | 0.5 | 0.29 |
| SVE-8 | Vent | - | 1.3 | - | - | - |
| SVE-9 | Vent | - | 0.5 | - | - | - |
| SVE-10 | Vacuum | 755 | 0.3 | 49.6 | 0.5 | 0.29 |

**Wellhead Operating Group**: SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10

**Date**: 3/8/2012

| Well | Operating Status | Velocity (ft/min) | Vacuum (inches H2O) | Temp (deg F) | PID[1] (ppm) | Adjusted PID[2] (ppm) |
|---|---|---|---|---|---|---|
| SVE-1 | Vacuum | 2270 | 3.7 | 51.3 | 0.0 | 0.00 |
| SVE-2 | Vent | - | 0.53 | - | - | - |
| SVE-3 | Vacuum | 3030 | 9 | 50.3 | 0.0 | - |
| SVE-4 | Vent | - | 0.9 | - | - | - |
| SVE-5 | Vacuum | 2360 | 10 | 49.3 | 0.0 | - |
| SVE-6 | Vacuum | 5150 | 12 | 48.6 | 0.0 | 0.00 |
| SVE-7 | Vacuum | 4180 | 13 | 56.3 | 0.0 | 0.00 |
| SVE-8 | Vent | - | 1.3 | - | - | - |
| SVE-9 | Vent | - | 0.44 | - | - | - |
| SVE-10 | Vacuum | 215 | 0.20 | 54.3 | 0.2 | 0.11 |

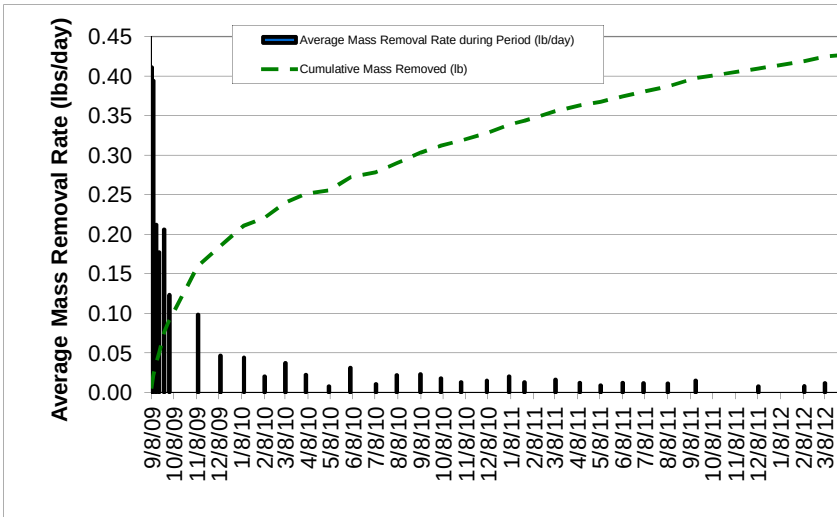
Notes:
[1] - Direct reading from photoionization detector (PID) equipment
[2] - Value adjusted using the 0.57 correction factor for tetrachloroethylene (PCE)
"-" Data not collected for this operating scenario

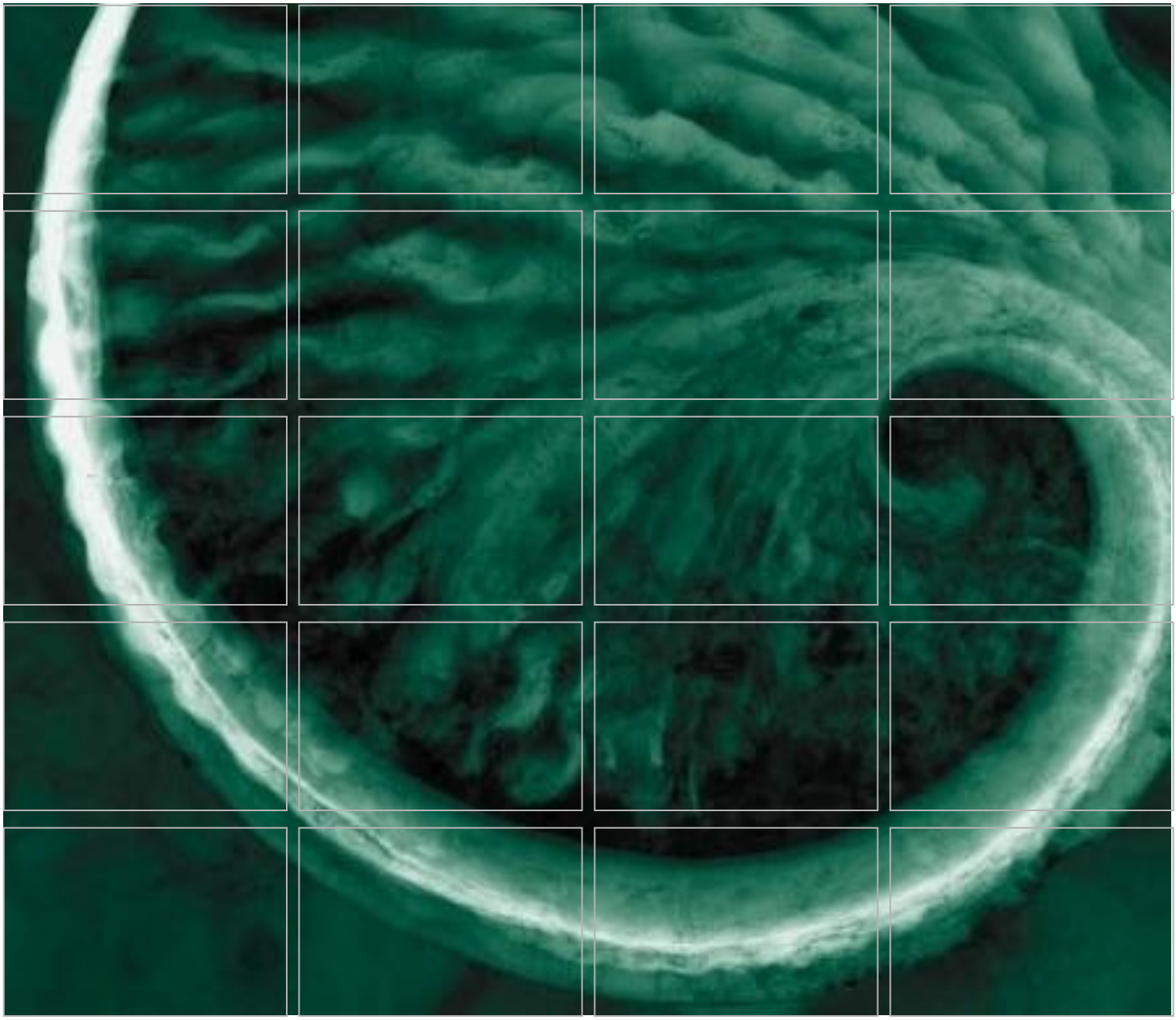
**Wellhead Operating Group**: SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10

*Attachment D*
*PCE Mass Removal Calculations*

| Date | Well Group Operating/SVE Wells | Effluent Vapor Concentration (ug/m3) | Flowrate (scfm) | Mass Removal Rate[1] (lb/day) | Average Mass Removal Rate during Period[2] (lb/day) | Period End Date | Mass Removed During Period[3] (lb) | Cumulative Mass Removed (lb) |
|---|---|---|---|---|---|---|---|---|
| 9/8/2009 | A | 74,000 | 62 | 0.41 | 0.41 | 9/8/2009 | 0.4 | 0.4 |
| 9/10/2009 | A | 69,000 | 61 | 0.38 | 0.39 | 9/10/2009 | 0.8 | 1.2 |
| 9/14/2009 | A | 8,500 | 62 | 0.05 | 0.21 | 9/14/2009 | 0.8 | 2.0 |
| 9/18/2009 | A | 54,000 | 64 | 0.31 | 0.18 | 9/18/2009 | 0.7 | 2.8 |
| 9/25/2009 | A | 18,000 | 65 | 0.10 | 0.21 | 9/25/2009 | 1.4 | 4.2 |
| 10/2/2009 | A | 25,000 | 64 | 0.14 | 0.12 | 10/2/2009 | 0.9 | 5.1 |
| 11/10/2009 | B | 8,100 | 74 | 0.05 | 0.10 | 11/10/2009 | 3.8 | 8.9 |
| 12/10/2009 | A | 5,500 | 79 | 0.04 | 0.05 | 12/10/2009 | 1.4 | 10.3 |
| 12/10/2009 | B | 5,900 | 85 | 0.04 | 0.04 | 1/11/2010 | 1.4 | 11.7 |
| 1/11/2010 | B | 5,700 | 85 | 0.04 | | | | |
| 1/11/2010 | A | 1,600 | 85 | 0.01 | 0.02 | 2/8/2010 | 0.6 | 12.3 |
| 2/8/2010 | A | 4,100 | 77 | 0.03 | | | | |
| 2/8/2010 | B | 4,600 | 77 | 0.03 | 0.04 | 3/8/2010 | 1.0 | 13.3 |
| 3/8/2010 | B | 5,800 | 83 | 0.04 | | | | |
| 3/8/2010 | A | 1,300 | 83 | 0.01 | 0.02 | 4/5/2010 | 0.6 | 14.0 |
| 4/5/2010 | A | 5,000 | 78 | 0.03 | | | | |
| 4/5/2010 | B | 1,300 | 78 | 0.01 | 0.01 | 5/6/2010 | 0.2 | 14.2 |
| 5/6/2010 | B | 960 | 74 | 0.01 | | | | |
| 5/6/2010 | A | 6,400 | 74 | 0.04 | 0.03 | 6/4/2010 | 0.9 | 15.1 |
| 6/4/2010 | A | 3,300 | 68 | 0.02 | | | | |
| 6/4/2010 | B | 2,700 | 68 | 0.02 | 0.01 | 7/9/2010 | 0.4 | 15.5 |
| 7/9/2010 | B | 750 | 72 | 0.005 | | | | |
| 7/9/2010 | A | 1,200 | 72 | 0.01 | 0.02 | 8/6/2010 | 0.6 | 16.1 |
| 8/6/2010 | A | 6,100 | 66 | 0.04 | | | | |
| 8/6/2010 | B | 3,500 | 66 | 0.02 | 0.02 | 9/7/2010 | 0.7 | 16.8 |
| 9/7/2010 | B | 4,000 | 71 | 0.03 | | | | |
| 9/7/2010 | A | 1,800 | 71 | 0.01 | 0.02 | 10/5/2010 | 0.5 | 17.3 |
| 10/5/2010 | A | 4,100 | 67 | 0.02 | | | | |
| 10/5/2010 | B | 1,900 | 67 | 0.01 | 0.01 | 11/1/2010 | 0.4 | 17.7 |
| 11/1/2010 | B | 2,100 | 79 | 0.01 | | | | |
| 11/1/2010 | C | 1,800 | 79 | 0.01 | 0.01 | 12/6/2010 | 0.5 | 18.2 |
| 12/6/2010 | C | 2,400 | 79 | 0.02 | | | | |
| 12/6/2010 | D | 2,600 | 79 | 0.02 | 0.02 | 1/5/2011 | 0.6 | 18.8 |
| 1/5/2011 | D | 3,000 | 83 | 0.02 | | | | |
| 1/5/2011 | E | 1,700 | 83 | 0.01 | 0.01 | 1/26/2011 | 0.3 | 19.1 |
| 1/26/2011 | E | 1,800 | 81 | 0.01 | | | | |
| 1/26/2011 | F | 2,300 | 81 | 0.02 | 0.02 | 3/9/2011 | 0.7 | 19.8 |
| 3/9/2011 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7 | 2,400 | 72 | 0.016 | | | | |
| 3/9/2011 | SVE-2, SVE-3, SVE-5, SVE-6 | 2,200 | 72 | 0.014 | 0.01 | 4/11/2011 | 0.4 | 20.2 |
| 4/11/2011 | SVE-7 | 1,400 | 79 | 0.010 | | | | |
| 4/11/2011 | SVE-1, SVE-3, SVE-5, SVE-6, | 1,100 | 79 | 0.008 | 0.01 | 5/9/2011 | 0.3 | 20.4 |
| 5/9/2011 | SVE-7, SVE-10 | 1,600 | 73 | 0.010 | | | | |
| 5/9/2011 | SVE-1, SVE-2, SVE-3, SVE-5, | 1,500 | 73 | 0.010 | 0.01 | 6/8/2011 | 0.4 | 20.8 |
| 6/8/2011 | SVE-6, SVE-7 | 2,200 | 75 | 0.015 | | | | |
| 6/8/2011 | SVE-2, SVE-3, SVE-5, SVE-6 | 2,200 | 75 | 0.015 | 0.01 | 7/6/2011 | 0.3 | 21.1 |
| 7/6/2011 | SVE-7, SVE-10 | 1,400 | 72 | 0.009 | | | | |
| 7/6/2011 | SVE-1, SVE-2, SVE-3, SVE-5, | 1,300 | 72 | 0.008 | 0.01 | 8/8/2011 | 0.4 | 21.5 |
| 8/8/2011 | SVE-6, SVE-7 | 2,300 | 69 | 0.014 | | | | |
| 8/8/2011 | SVE-2, SVE-3, SVE-5, SVE-6 | 2,000 | 69 | 0.012 | 0.02 | 9/15/2011 | 0.6 | 22.1 |
| 9/15/2011 | SVE-7, SVE-10 | 2,900 | 68 | 0.018 | | | | |
| 9/15/2011 | SVE-5, SVE-6, SVE-7, SVE-8, SVE-9, SVE-10 | 1,300 | 68 | 0.008 | 0.0079 | 12/9/2011 | 0.7 | 22.7 |
| 12/9/2011 | SVE-1, SVE-2, SVE-3, SVE-4, SVE-5, SVE-6, SVE-7, SVE-8, SVE-9, SVE-10 | 1,300 | 71 | 0.008 | 0.0083 | 2/9/2012 | 0.51 | 23.3 |
| 2/9/2012 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | 1,800 | 73 | 0.012 | 0.0118 | 3/8/2012 | 0.33 | 23.6 |
| 3/8/2012 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | 1,400 | 73 | 0.009 | 0.0092 | 4/30/2012 | 0.26 | 23.8 |
| 4/30/2012 | SVE-1, SVE-3, SVE-5, SVE-6, SVE-7, SVE-10 | 1,400 | 73 | 0.009 | 0.0092 | tbd | 0.49 | 24.3 |
| **TOTAL** | | - | - | - | - | - | - | **24.3** |

Notes:
[1]Mass Removal = [flowrate (scfm) x PCE Concentration (ug/m3) x 0.0283168 (m3/cf) x 2.2E-9 (lb/ug) x 1440 (minutes/day)
[2]Average mass removal rate is calculated based on beginning and end of period vapor concentrations.
[3]Initial period assumes startup on 9/8/2009 (1 day).
[a] - Effluent concentration from this sample will be used in mass removal rate calcualtion for following operating period.





# Revised Feasibility Study

**Manhattan Village Shopping Center and Harris Properties**
**17817-17825 and 17835 1st Avenue South**
**Normandy Park, Washington**

September 2012

www.erm.com

**Prepared for:**
Riddell Williams P.S. &
Wolfstone, Panchot & Bloch

ERM

*Delivering sustainable solutions in a more competitive world*

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# Revised Feasibility Study

Manhattan Village Shopping Center and Harris Properties
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September 2012

Project No. 0159723

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## *1.0 INTRODUCTION*

ERM-West Inc. (ERM) has prepared this Feasibility Study (FS) for the Manhattan Village Shopping Center (MVSC) and Harris Property at 17817-17825 and 17835 1st Avenue South in Normandy Park, Washington (the "Site"). This FS reflects additional data obtained since the preparation of the draft FS in August 2008 and has been prepared in consideration of the Washington Administrative Code (WAC) part 173-340-360. Because the site will be cleaned up to groundwater cleanup standards, a FS including a full disproportionate cost analysis is not necessary because institutional controls are not included in the remedial alternatives.

The Site location is shown on Figure 1. The purpose of this revised FS is to develop and evaluate remedial alternatives to identify a cleanup action that addresses tetrachloroethene (PCE) impacts to soil and groundwater at the Site.

ERM has conducted this FS on behalf of both property owners to comply with the terms of the CR2A agreement dated 15 August 2007. Site work will also be reviewed by the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP) under agreement with the VCP (file number NW1873).

## *2.0 SITE BACKGROUND*

Chlorinated volatile organic compounds have been detected in soil and groundwater at the Site as a result of historical releases of PCE, a dry cleaning solvent, from dry cleaning operations at Four Star Cleaners in the MVSC property and from the former Manhattan Cleaners and Coin-Op Laundry on the Harris property. Figure 2 provides a site plan showing the location of the MVSC and Harris properties, as well as key site features such as the locations of monitoring wells and Site infrastructure. Multiple phases of investigation and remediation have been performed by the landowners to identify the nature and extent of the soil and groundwater impacts on their respective properties.

## *3.0 SITE INVESTIGATION AND REMEDIATION SUMMARY*

The following summary is divided into soil and groundwater sections which are presented chronologically. In addition to the work conducted at the Site by ERM between 2008 and the present, other environmental investigations and remediation efforts were conducted between 1998 and the present by Aspect Consulting, Farallon Consulting, Kane Environmental Inc., and SCS Engineers. The summary below focuses on work completed since 2008. ERM's 2009 *Manhattan Village Shopping Center and Harris Properties Final Data Gap Investigation Report* summarizes the results of site investigation work conducted prior to 2008 in greater detail.

### *Soil*

PCE has been historically detected in vadose zone soils at both properties at the Site at concentrations greater than the Washington State Model Toxics Control Act (MTCA) [Chapter 173-340 WAC] Method A Cleanup Level (MTCA Method A) of 50 micrograms per kilogram (µg/kg). Soil contaminated with PCE has generally been observed in the vicinity of the abandoned septic tanks on both the MVSC and Harris properties, in soils near the abandoned sewer line on the MVSC property, and under the Four Star Dry Cleaners.

Limited soil remediation by soil vapor extraction (SVE) was performed at the Site in 1999. Data collected during this period of remediation indicates that the system recovered a significant mass of PCE from Site soils. However, this system was decommissioned prior to full remediation of PCE in soils in the vicinity of the SVE system to less than the MTCA Method A cleanup level.

In 2008, ERM collected additional soil samples along the alignment of the abandoned sewer line near the MVSC and Harris property boundary. During this sampling event, PCE was detected at concentrations greater than the MTCA Method A Cleanup Level in soils along this alignment. The results of this sampling effort are summarized on Figure 3.

In 2009, ERM installed a second SVE system as an interim remedial action to address the PCE contamination in vadose-zone soil confirmed during the 2008 investigation. The SVE system was installed to provide vapor extraction across the site, including the vicinity of the former sanitary sewer line on the MVSC property, and the former septic system at the Harris property. Using data collected during the operation and maintenance of this system, ERM estimates that approximately

24.3 pounds of PCE have been recovered by the system as of the end of April 2012. Based on individual well sampling data and combined effluent data, ERM concludes that while overall system extraction rates have equilibrated to nearly a steady rate of approximately 0.25 pounds of PCE per month, PCE vapor concentrations at two of the extraction wells still appear to be decreasing linearly, suggesting that effective remediation is ongoing at these locations.

ERM collected additional soil samples in 2011 and 2012 to evaluate the effectiveness of the SVE system at remediating site soils. The data collected from these samples showed that the SVE system has successfully reduced the concentration of PCE in site soils to less than the MTCA Method A Cleanup level at each of the soil sampling locations, including the alignment of the abandoned sewer line and under the 4 Star Dry Cleaners.

*Groundwater*

Based on water level monitoring at the Site, groundwater flow is generally from the south to the north. The groundwater gradient across the Site is approximately 0.006 foot horizontal per foot vertical (ft/ft), and increases to approximately 0.03 ft/ft to the north of SE 178$^{th}$ Street.

Groundwater samples have been collected periodically from a network of monitoring wells at the Site since 1998. Analytical results for the groundwater samples are summarized in Table 1. The horizontal distribution of PCE at concentrations greater than the MTCA Method A groundwater cleanup standard of 5 micrograms per liter (µg/L) is shown on Figure 4. The area greater than 5 ug/L ranges from near the abandoned septic tank on the MVSC property to the south, across the MVSC and Harris properties and onto the Dunn Lumber Property across SW 178$^{th}$ Street to the north, and across the majority of the Harris property to the east and west. Based on results of groundwater samples collected from shallow and deep well pairs, the vertical distribution of PCE appears to be limited to the upper 5 to 10 feet of the saturated zone downgradient of the PCE source area on the MVSC property.

The highest concentrations of PCE in groundwater have typically been found near the western half of the east-west property line which divides the MVSC and Harris properties. This area is coincident with the location of an abandoned bell socket-type concrete pipe line that used to serve as the sanitary sewer line from the Four Star Cleaners facility, which is suspected of being a primary source of PCE contamination at the Site.

In 2006, Kane Environmental conducted an in well air stripping pilot study over a period of 10 weeks using a single remediation well. The pilot study demonstrated reductions in PCE concentration in groundwater samples collected from the remediation well. Groundwater sampling results from nearby wells did not suggest a site wide decrease in PCE attributable to the pilot study.

ERM conducted an in situ chemical oxidation (ISCO) pilot study between November 2010 and October 2011 in accordance with the *Final In Situ Chemical Oxidation Pilot Study Work Plan* (ERM, March 2011). The results of the pilot study were presented in the *In Situ Chemical Oxidation Pilot Study Completion Report* (ERM, January 2012). A summary of the pilot study is presented below:

- Baseline groundwater samples were collected from the 15 pilot study performance monitoring wells within and near the pilot study target area (November 2010);
- A total of approximately 30,000 gallons of 2.5 percent potassium permanganate solution was injected at 15 locations within the pilot study target area (April 2011);
- Groundwater samples were collected from the 15 pilot study performance monitoring wells at periods of one month, three months, and six months after the injections (May 2011, July 2011, and October 2011);
- Potassium permanganate was observed in six of the 15 performance monitoring wells. At these six locations the concentration of PCE in initially decreased; and
- Later groundwater sampling rounds showed that at three of the six performance monitoring wells where PCE concentrations initially decreased, PCE concentrations subsequently returned to concentrations similar to those observed prior to the pilot study.

***Site Investigation and Remediation Conclusions***

Based upon the results of the soil and groundwater sampling conducted to date, as well as the results of SVE system operation and the ISCO pilot study, ERM concludes the following:

- Based on recent soil sampling results, the majority of PCE mass in the vadose zone has been removed by the SVE system, and the concentration of PCE in samples of Site soils is less than the MTCA Method A cleanup level.

- Initial pilot test results demonstrated that potassium permanganate can effectively remediate PCE dissolved in Site groundwater. However, at three of the six monitoring wells affected by the injections PCE concentrations in groundwater returned to levels similar to those observed prior to the pilot study within the year after the completion of the pilot test injections.
- Based on the Site conceptual model, historical knowledge of the Site, and the results of the pilot study, it is most likely that the concentration of PCE in groundwater increased after the pilot study as a result of matrix diffusion of residual PCE from soil in the saturated zone and/or capillary fringe. Matrix diffusion is the process by which PCE sorbed to soil particles slowly desorbs from the soil and dissolves in surrounding groundwater across a concentration gradient.
- The site has been well characterized. Given the extensive amount of investigation performed to date and the nature of the remedial alternatives likely to be effective at addressing PCE dissolved in groundwater, additional soil and groundwater investigation is unlikely to be a cost effective approach to achieving site cleanup objectives relative to the implementation of the remedial approach outlined below.

## *4.0 IDENTIFICATION AND SCREENING OF REMEDIAL TECHNOLOGIES*

The identification and screening of the remedial technologies for this FS was conducted in consideration of the WAC Chapters 173-240-350 and 173-240-360. Potential remedial technologies to address soil and groundwater at the Site are presented in Table 1. In accordance with WAC 173-340-350(8)(b), an initial screening of potential remedial technologies was conducted to eliminate those that are least suitable for addressing impacted media and achieving cleanup goals.

## *5.0 DEVELOPMENT OF REMEDIAL ALTERNATIVES*

The technologies that were retained through the initial screening in Table 2 were combined into workable remedial systems (alternatives) designed to achieve initial cleanup goals. The alternatives selected to be considered for implementation at the Site are shown in Table 3 and include:

- Alternative 1: No Action (for comparison purposes only).
- Alternative 2: Site-wide air sparging (AS) with SVE:
    - This alternative consists of expanding the existing SVE system to provide vapor extraction across the site and installation of an air sparging system across the site. An upgrade to the SVE system was included to treat condensate onsite to reduce the cost of condensate disposal. An operational period of two years has been assumed with three years of quarterly groundwater monitoring.
- Alternative 3: Source Area SVE with site-wide ISCO using potassium permanganate:
    - This alternative combines the existing SVE system with the upgrades described above with side wide ISCO injections using potassium permanganate. For costing purposes, two phases of injection each consisting of 30 injection locations were assumed. The volume of injectate used in the source area during the second phase of injection was assumed to be one half the amount used during phase one. Injections were assumed to be conducted in a single calendar year, the SVE system operational period was assumed to be two years, and three years of quarterly groundwater monitoring was included.
- Alternative 4: Source Area AS/SVE with site-wide ISCO using potassium permanganate:
    - This alternative consists of the installation of several air sparging wells in the source zone using the existing SVE system with the upgrades described above to recover vapors, followed by two phases of ISCO (source area and down gradient) to polish groundwater. Injections were assumed to be conducted in a single calendar year, the AS/SVE system operational period was assumed to be two years, and three years of quarterly groundwater monitoring was included.
- Alternative 5: Source Area SVE and ISCO using ozone sparging with downgradient ISCO using potassium permanganate:

    - This alternative is the same as Alternative 4, but includes an ozone generating system in the air sparging infrastructure, as well as additional indoor air sampling.
- Alternative 6: Site-wide in-well air stripping:
    - This Alternative includes the installation of 35 in-well air stripping wells spread out across the site. An operational period of two years was assumed including three years of quarterly groundwater monitoring.
- Alternative 7: Source Area SVE with Site-wide pump and treat:
    - This Alternative includes the operation of the existing SVE system in the source area and the installation of 36 groundwater extraction wells across the site. An operational period of two years was assumed including three years of quarterly groundwater monitoring.

Site specific data collected during these efforts has been used to support the evaluation of the remedial alternatives presented in this FS. Where available, pilot study results were used to evaluate the remedial alternatives. For technologies not previously implemented at the site (air sparging, ozone sparging, and pump and treat), the remedial alternatives were developed based on FS-level conceptual design parameters, engineering judgment, and knowledge of current Site conditions. The remedial alternatives have been developed and evaluated in consideration of the requirements of MTCA Chapter 173-340-360 WAC, which stipulates the cleanup action selection process.

All of the alternatives described above meet the minimum requirements described in WAC 173-340-360(2), including the threshold requirements stipulated in WAC 173-340-360(2)(a):

- Protect human health and the environment;
- Comply with cleanup standards;
- Comply with applicable state and federal laws; and
- Provide for compliance monitoring.

## *6.0 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES*

The active remediation alternatives described above have been evaluated in this FS in consideration of the requirements stated in WAC 173-340-360(2)(b), which requires that a cleanup action use permanent solutions to the maximum extent possible, provide for a reasonable restoration time frame, and consider public concerns.

1. **Protectiveness:** Overall protectiveness of human health and the environment including degree of risk reduction, time required to reduce risk, risks resulting from implementation, and improvement of environmental quality.
2. **Permanence:** Degree to which toxicity, mobility, and volume of hazardous substances are reduced including destruction of hazardous substances, reduction/elimination of releases and sources, degree of irreversibility of treatment, and characteristics and quantity of treatment residuals.
3. **Cost:** Cost to implement the alternative including construction and net-present value of long-term costs (e.g., operation, maintenance, monitoring, and equipment replacement) based on an estimated design life.
4. **Effectiveness over the long term:** Reliability of alternative over period of time hazardous substances are anticipated to remain on site, magnitude of residual risk, and management of treatment residuals.
5. **Management of short term risks:** Risk to human health and the environment during implementation of the alternative.
6. **Technical and administrative implementability:** Ability to implement alternative including technical feasibility, availability of resources, administrative and regulatory requirements, schedule, and site access.
7. **Consideration of public concerns:** Extent to which community with interest in the site has concerns regarding alternative and how the concerns are addressed, if required.

An evaluative comparison of the proposed remedial alternatives based on the seven criteria listed above is provided in Table 3. Conceptual FS-level cost estimates (+50 percent/-30 percent) for each remedial alternative were prepared and incorporated into the table. The costing spreadsheets for each alternative are provided in Appendix A. The evaluation balancing criteria were evaluated based on a numeric rating of 0

(no/none) to 5 (high) to quantify the degree to which the remedial alternative meets the criteria.

## *7.0 PREFERRED REMEDIAL ALTERNATIVE*

Based on the results of the comparative analysis of the proposed remedial alternatives (Table 3), the preferred alternative is Source Area AS/SVE followed by site-wide ISCO using potassium permanganate (Alternative 4). As shown in Table 3, Alternative 4 compares favorably to all other alternatives for each of the evaluation criteria, and received the highest overall score, 26 out of 30. It also meets the criteria for a reasonable restoration time frame. The total cost for Alternative 4 is estimated at $1,311,000.

In addition to ranking highest overall, Alternative 4 is the recommended alternative as it combines the strengths of AS/SVE (e.g., longevity of treatment) and ISCO (e.g., rapid treatment to low concentrations) to provide the most practical treatment available to address residual PCE whether it is present in the vadose zone, saturated zone, or the capillary fringe, as summarized in the Table 4 below. The strategy of Alternative 4 is to employ AS/SVE in the source area to provide longer-term, on-going treatment in the suspected source areas where matrix diffusion is expected to drive on-going, low concentrations of PCE in the dissolved phase; followed by ISCO in the source area and the downgradient portion of the site to treat the diffuse, lower concentration, dissolved phase plume. It is possible that AS alone will sufficiently remediate the source area, in which case ISCO would only be required in the downgradient portion of the site.

*Table 4* ***Relative Expected Treatment Effectiveness, Specific to Site Conditions and Contaminants***

| Treatment Technology | Vadose Zone | Capillary Fringe | Saturated Zone |
|---|---|---|---|
| Air Sparging | Low | Moderate | Moderate |
| In Situ Chemical Oxidation | Low | Moderate | High |
| Soil Vapor Extraction | High | Low | Low |
| **Combined Effectiveness** | **High** | **Moderate** | **High** |

The following discussion provides a comparison of the observed and expected benefits and limitations provided by ISCO and AS at the site.

### *Remedial Duration*

The finite life of potassium permanganate can limit dispersion to all areas of the aquifer, leaving recalcitrant contaminant areas after the potassium permanganate is consumed in the aquifer. Typically this effect is addressed by conducting multiple injections; however, this approach tends to be less cost effective when more than two full scale injections are required to treat an area.

AS systems are generally operated for a relatively long period of time (months to years), establishing and maintaining concentration gradients that help disperse contaminants out of areas of the aquifer that ISCO solution may not reach directly. Also, once an AS system is installed and operational, extending the operation of the AS system as long as PCE concentrations continue to decrease in groundwater, is typically incrementally less costly than would be experienced with multiple ISCO injections.

### *Delivery Mechanics and Distribution*

*Lateral Distribution*

ISCO tends to provide good lateral distribution of the remedial agent, and does not require the installation of permanent infrastructure to remediate a large area; while an AS system capable of treating the entire plume would require a large, capital intensive installation. Furthermore, ISCO applications can be tailored to treat specific portions of the site based on groundwater sampling results, while AS systems are difficult and costly to reconfigure after installation.

*Vertical Distribution*

If the PCE source is in the vadose zone and/or within the seasonal range of the capillary fringe, ISCO solution may not reach the contaminated area or, if it does, the residence time for ISCO solution may be too short to be effective, especially during seasonal low water table periods.

Combined with SVE, AS provides an ongoing treatment of the vadose zone, as well as the upper capillary fringe during periods of seasonal low water table, providing more complete remediation through a vertical cross-section of the aquifer.

Natural Oxidant Demand (NOD)

Although sampling results indicate that NOD in the aquifer at the Site is low, most of the ISCO injectate is still likely being consumed by reactions with materials other than PCE. NOD effects, especially if NOD is locally higher in some parts of the aquifer, may limit the effectiveness of ISCO at the Site. AS effectiveness is not affected by NOD.

Effectiveness at Low Concentrations

AS is typically applied to groundwater plumes with higher concentrations of PCE in groundwater than those observed at the Site, and the cleanup level achievable using this technology is highly site specific. This is due to the fact that the effectiveness of AS reduces as concentrations of PCE in groundwater decrease. In addition, AS is commonly employed for volatile compounds which also degrade aerobically so as to recognize the dual treatment mechanisms of stripping and aerobic biodegradation; however, PCE does not appreciably degrade aerobically. Site conditions are considered favorable for an effective application of AS (i.e., relatively homogeneous lithology), however; it is possible that AS alone will not be capable of meeting the cleanup goals. ISCO is generally considered very effective at treating low concentrations of dissolved groundwater contamination as its effectiveness is not as impaired by the contaminant concentration as with AS, and therefore provides complimentary remediation to AS.

Conclusions

The ability of AS to provide cost-effective, sustained remediation within the source area, combined with the demonstrated ability of ISCO to treat low concentration of PCE dissolved in groundwater, should provide a robust solution to remediation of the source area. In addition, due to the operational flexibility and rapid treatment kinetics of ISCO, this alternative provides a cost effective means of remediating the downgradient portion of the plume once the source area is addressed.

***Conceptual Air Sparge/Soil Vapor Extraction System Description***

Alternative 4 consists of groundwater monitoring and AS/SVE applied to the source zone followed by Site-wide application of ISCO. AS wells would be installed only in the source zone and would utilize the existing SVE system infrastructure for vapor collection. This alternative assumes that AS/SVE will be applied to the source zone until groundwater sampling demonstrates compliance with site cleanup objectives, or until

no further decrease of PCE concentration in groundwater is observed, and no recontamination is observed after deactivating the system. If the concentration of PCE in groundwater increases after system deactivation, the system will be reactivated until sustained remediation is achieved. If groundwater cleanup objectives are achieved using AS/SVE alone, subsequent ISCO in the source zone may not be necessary; however, ISCO treatment in the source zone has been assumed for cost estimating purposes.

Based on investigations conducted to date, once effective remediation of the source zone is achieved using the combined AS/SVE and ISCO technologies, ISCO alone should be effective at remediating groundwater across the remainder of the site.

*Air Sparging*

For purposes of developing this FS, the AS/SVE system is assumed to consist of approximately six AS and the existing SVE wells (Figure 5). The AS wells will be screened immediately above the indurated silt layer that bounds the bottom of the sandy aquifer. Most of the existing SVE wells are screened between approximately 10 and 30 feet bgs, which is a suitable interval for the recovery of vapors from the AS system. Polyvinyl chloride (PVC) piping will be used to convey sparged air to the formation. The remediation system would include a compressor, blower, knockout tank for condensate collection, and a condensate storage/treatment tank.

*In Situ Chemical Oxidation*

Prior to initiating ISCO, groundwater sampling will be conducted to evaluate the effectiveness of the AS/SVE system. The final design (e.g., configuration of injection points, injection volumes, and injection concentrations) of the ISCO injection program will be based on the groundwater conditions observed after operation of the AS/SVE system. ISCO injection was assumed to be performed using temporary direct push injection points, however; the final design may utilize other techniques (e.g., semi-permanent injection wells) to improve performance relative to matrix diffusion challenges, including low flow or gravity fed systems, as well as injectate recirculation. ISCO solution will only be injected into those areas where PCE remains at concentrations greater than the cleanup objectives after the AS/SVE treatment, and, as discussed above, ISCO may only be required downgradient of the AS/SVE area if AS/SVE remediates the source area effectively.

The distribution of ISCO injection locations used to develop this FS is shown on Figure 5. Injections are assumed to be completed in two phases spaced several months apart, as follows:

- Phase 1 Source Area – 16 injection points (3,000 gallons per point) near the former sewer line and septic tank on the MVSC property; and
- Phase 2 Source Area Polishing and Downgradient Plume – Five injection points (3,000 gallons per point) near the former sewer line on the MVSC property and 28 injection points (3,000 gallons per point) across the Harris property (including near the former Harris property septic tank).

It is assumed the potassium permanganate will be injected as a 2.5 percent by weight solution in two 5-foot depth intervals using temporary injection points advanced by direct-push drilling methods. Injection depths will range from within the capillary fringe (to address the zone of seasonal groundwater fluctuations) to approximately 5 feet below the top of the water table. The water table is typically encountered between 32 and 42 feet bgs. The injection points will be located approximately 30 feet on center, assuming an effective radius of influence of approximately 15 feet.

The costs developed for this FS assume that the potassium permanganate solution will be premixed at an off-site location to the target concentration and then delivered to the Site in a tanker truck. A staging area enclosed with a chain link fence will be set up and will include a tank staging area with secondary containment, the injection pump and manifold, a generator, and a storage trailer to store the manifold along with ancillary injection equipment and supplies.

## *8.0 PERFORMANCE MONITORING*

Performance monitoring will be implemented monthly for the first three months after initiating the AS system, followed by quarterly sampling throughout the remediation program. The performance monitoring wells sampled during each event will vary based on the portion of the site undergoing active remediation to provide adequate information to evaluate the effectiveness of the remediation in a cost effective manner.

## *9.0 CONCLUSIONS*

This FS has been performed to evaluate the remedial alternatives available to address elevated concentrations of PCE dissolved in groundwater at the site in consideration of the methodology provided in WAC 173-340-360.

The recommended remedial alternative is Alternative 4 AS/SVE in the PCE source area with ISCO using potassium permanganate solution as a polishing technology in the source area, and as primary treatment across the remainder of the Site. Alternative 4 is the recommended alternative as it combines the strengths of AS/SVE (e.g., longevity of treatment) and ISCO (e.g., rapid treatment to low concentrations) to provide the most practical treatment available to address residual PCE whether it is present in the vadose zone, saturated zone, or the capillary fringe.

Based on a preliminary design of the remediation approach, ERM estimates that the cost of the preferred remedial alternative will be $1,311,000.

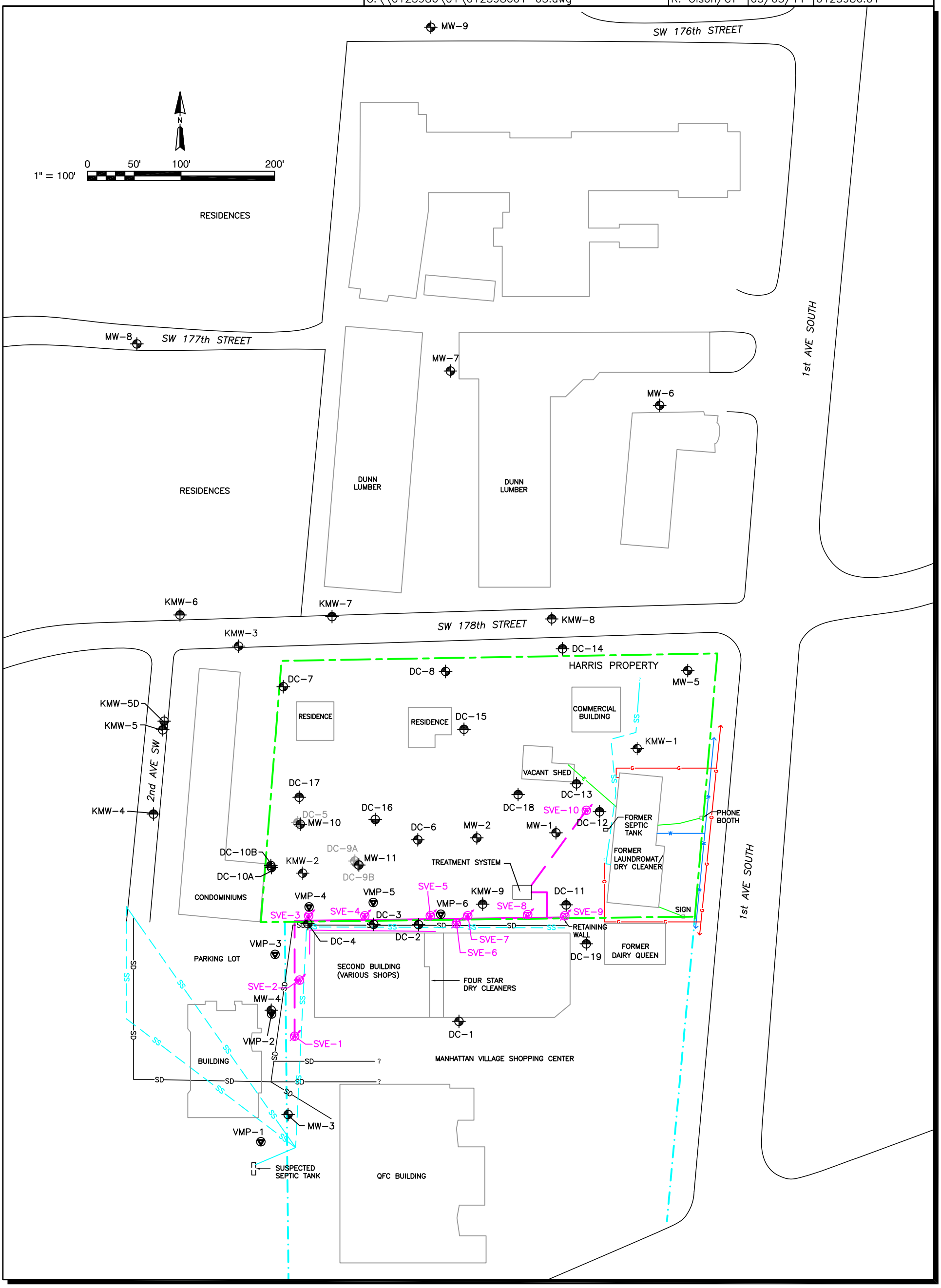
*Figures*

References:
TOPO!® Software
U.S.G.S. 7.5 Minute Series (Topographic) Quadrangle,
Des Moines, WA
Version: 1995; Current: 1990

Figure 1
*Site Location Map*
*Normandy Park PCE*
*Normandy Park, Washington*

ERM *12/07*

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| G:\\0123986\01\012398601-03.dwg | R. Olson/CT | 03/03/11 | 0123986.01 |




LEGEND

- ABANDONED MONITORING WELL
- MONITORING WELL
- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- EXISTING SVE WELL
- EXISTING VAPOR MONITORING WELL
- APPROXIMATE HARRIS PROPERTY BOUNDARY
- APPROXIMATE MANHATTAN VILLAGE SHOPPING CENTER PROPERTY BOUNDARY
- E — UNDERGROUND ELECTRICAL UTILITY
- G — UNDERGROUND NATURAL GAS UTILITY
- SS — UNDERGROUND SEWER UTILITY
- SD — UNDERGROUND STORM DRAIN UTILITY
- W — UNDERGROUND WATER UTILITY

Figure 2
*Site Plan*
*MVSC/Harris Properties*
*Normandy Park, Washington*
ERM 03/11

Project No. 0159723.01
Date: 08/22/12
Drawn By: R. Olson
CAD File: G:\0159723\01\01597301-06.dwg

SW 178th STREET

2nd AVE SW

1st AVE SOUTH

HARRIS PROPERTY

MANHATTAN VILLAGE SHOPPING CENTER

CONDOMINIUMS

COMMERCIAL BUILDING

WELL HOUSE

VACANT SHED

FORMER SEPTIC TANK

FORMER LAUNDROMAT / DRY CLEANER

PHONE BOOTH

SIGN

RETAINING WALL

FORMER DAIRY QUEEN

SECOND BUILDING (VARIOUS SHOPS)

FOUR STAR DRY CLEANERS

PARKING LOT

BUILDING

QFC BUILDING

SUSPECTED SEPTIC TANK

B-1 SB-1 B-2 B-3 SB-4 B-4 B-5 SB-5 B-6 SB-6 B-7 B-8 SB-7 B-9 B-10 SB-8 B-11 B-12 B-13 SB-2 B-14 SB-9 B-15 B-16 SB-3

| B-12 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/27/08 | 10' | ND |
| | 20' | 2.99 |
| | 30' | 8.48 |

| B-11 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/27/08 | 10' | 32.4 |
| | 20' | 346 |
| | 30' | 279 |

| SB-1 | | |
|---|---|---|
| Date | Depth | PCE |
| 04/19/11 | 10' | ND |
| | 20' | ND |
| | 30' | ND |

| SB-6 | | |
|---|---|---|
| Date | Depth | PCE |
| 02/29/12 | 5' | ND |
| | 10' | 28 |
| | 20' | ND |
| | 30' | ND |
| | 38' | ND |

| B-9 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/25/08 | 10' | 6.16 |
| | 20' | 14.3 |
| | 30' | 11.6 |

| B-8 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/26/08 | 10' | 6.54 |
| | 20' | 5.54 |
| | 30' | 5.62 |

| B-7 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/25/08 | 10' | ND |
| | 20' | 3.51 |
| | 30' | 8.84 |

| B-5 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/26/08 | 10' | ND |
| | 20' | 3.4 |
| | 30' | 8.88 |

| SB-5 | | |
|---|---|---|
| Date | Depth | PCE |
| 02/29/12 | 10' | ND |
| | 20' | ND |
| | 30' | ND |

| SB-4 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/01/12 | 5' | ND |
| | 10' | ND |
| | 20' | ND |
| | 30' | ND |
| | 34' | ND |

| B-13 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/27/08 | 10' | 31.1 |
| | 20' | 31.4 |
| | 30' | 23.1 |

| SB-2 | | |
|---|---|---|
| Date | Depth | PCE |
| 04/19/11 | 10' | ND |
| | 20' | ND |
| | 30' | ND |

| SB-8 | | |
|---|---|---|
| Date | Depth | PCE |
| 02/29/12 | 10' | ND |
| | 20' | ND |
| | 30' | ND |

| B-16 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/25/08 | 10' | ND |
| | 20' | ND |
| | 30' | ND |

| SB-7 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/01/12 | 5' | ND |
| | 20' | ND |
| | 30' | ND |
| | 38' | ND |
| | 43' | ND |

| B-14 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/24/08 | 10' | 11.8 |
| | 20' | 29.6 |
| | 30' | 594 |

| B-15 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/24/08 | 10' | 5.32 |
| | 20' | 18.8 |
| | 30' | 7.85 |

| SB-9 | | |
|---|---|---|
| Date | Depth | PCE |
| 04/28/12 | 2' | ND |
| | 8' | 13 |
| | 12' | ND |
| | 20' | ND |

| B-10 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/24/08 | 10' | 671 |
| | 20' | 50.8 |
| | 30' | 15.4 |

| B-6 | | |
|---|---|---|
| Date | Depth | PCE |
| 03/25/08 | 10' | ND |
| | 20' | 8.16 |
| | 30' | 8.99 |

| SB-3 | | |
|---|---|---|
| Date | Depth | PCE |
| 04/19/11 | 10' | ND |
| | 20' | ND |
| | 30' | ND |

LEGEND

- Soil Boring, Completed 2008
- Soil Boring, Completed 2011
- Soil Boring, Completed 2012
- 32.4 PCE Concentration (µg/kg)
- 279 PCE Concentration Greater Than Cleanup Standard (50 µg/kg)
- Inferred Impacted Soil Boundary, April 2008 Data
- Inferred Impacted Soil Boundary, April 2005 Data
- Approximate Harris Property Boundary
- Approximate Manhattan Village Shopping Center Property Boundary
- Underground Electrical Utility
- Underground Natural Gas Utility
- Underground Sewer Utility
- Underground Storm Drain Utility
- Underground Water Utility

N

1" = 100' 0 50' 100' 200'

Figure 3
*Summary of PCE in Soil Samples*
*MVSC/Harris Properties*
*Normandy Park, Washington*

ERM 08/12

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| G:\\0159723\01\015972301-02.dwg | R. Olson | 08/23/12 | 0159723.001 |

N

0 50' 100' 200'

1" = 100'

SW 176th STREET

1st AVE SOUTH

2nd AVE SW

SW 177th STREET

SW 178th STREET

RESIDENCES

DUNN LUMBER

HARRIS PROPERTY

COMMERCIAL BUILDING

RESIDENCE

VACANT SHED

FORMER SEPTIC TANK

PHONE BOOTH

FORMER LAUNDROMAT/ DRY CLEANER

SIGN

RETAINING WALL

FORMER DAIRY QUEEN

CONDOMINIUMS

PARKING LOT

SECOND BUILDING (VARIOUS SHOPS)

FOUR STAR DRY CLEANERS

TREATMENT SYSTEM

BUILDING

SUSPECTED SEPTIC TANK

QFC BUILDING

MANHATTAN VILLAGE SHOPPING CENTER

| | | | |
|---|---|---|---|
| MW-9 | 2.0U | MW-8 | 2.0U |
| MW-7 | 14 | MW-6 | 2.0U |
| KMW-6 | 2.0U | KMW-7 | 3.3 |
| KMW-8 | 10 | KMW-3 | 6.8 |
| DC-14 | 11 | DC-7 | 18 |
| DC-8 | 18 | MW-5 | 2.0U |
| KMW-5D | 2.0U | KMW-5 | 2.0U |
| DC-15 | 20 | MW-14 | 2.0U |
| KMW-1 | 2.0U | DC-17 | 2.0U |
| DC-18 | 7.2 | DC-13 | 6.4 |
| KMW-4 | 2.0U | DC-16 | 2.0U |
| DC-12 | 3.7 | MW-10 | 6.7 |
| DC-6 | | MW-2 | 7.1 |
| MW-1 | | DC-9A | |
| DC-9B | | DC-10B | 2.0U |
| MW-11 | 29 | DC-10A | 41 |
| KMW-2 | 25 | MW-15 | 2.0U |
| KMW-9 | 4.0 | DC-11 | 3.1 |
| DC-3 | 2.9 | DC-4 | 22 |
| DC-2 | 2.0U | DC-19 | 2.0U |
| MW-13 | 2.0U | MW-4 | 11 |
| DC-1 | 2.0U | MW-3 | 5.8 |
| MW-12 | 2.0U | | |

LEGEND

- ABANDONED, LOST OR DESTROYED MONITORING WELL
- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- 2.0U / 3.1 / 11 — TETRACHLOROETHENE (PCE) CONCENTRATION (µg/L); BOLDED VALUE INDICATES GREATER THAN DETECTION LEVEL AND LESS THAN CLEANUP LEVEL; BLUE SHADING INDICATES GREATER THAN CLEANUP LEVEL
- U — NOT DETECTED AT METHOD DETECTION LIMIT
- 10 — PCE CONCENTRATION CONTOUR (µg/L); DASHED WHERE INFERRED
- APPROXIMATE HARRIS PROPERTY BOUNDARY
- APPROXIMATE MANHATTAN VILLAGE SHOPPING CENTER PROPERTY BOUNDARY
- E — UNDERGROUND ELECTRICAL UTILITY
- G — UNDERGROUND NATURAL GAS UTILITY
- SS — UNDERGROUND SEWER UTILITY
- SD — UNDERGROUND STORM DRAIN UTILITY
- W — UNDERGROUND WATER UTILITY

Figure 4

*Tetrachloroethene in Groundwater, April 2012*

*MVSC/Harris Properties*

*Normandy Park, Washington*

ERM 08/12

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| G:\\0159723\01\015972301-07.dwg | R. Olson | 09/11/12 | 0159723.001 |

N

0 50' 100' 200'

1" = 100'

RESIDENCES

MW-9 2.0U

SW 176th STREET

MW-8 2.0U

SW 177th STREET

1st AVE SOUTH

2nd AVE SW

MW-7 14

MW-6 2.0U

5

10

20

30

40

DUNN LUMBER

DUNN LUMBER

RESIDENCES

KMW-6 2.0U

KMW-7 3.3

KMW-3 6.8

SW 178th STREET

KMW-8 10

DC-14 11

HARRIS PROPERTY

DC-8 18

DC-7 18

MW-5 2.0U

KMW-5D 2.0U

KMW-5 2.0U

RESIDENCE

RESIDENCE

COMMERCIAL BUILDING

DC-15 20

KMW-1 2.0U

MW-14 2.0U

VACANT SHED

DC-13 6.4

DC-18 7.2

DC-17 2.0U

KMW-4 2.0U

DC-16 2.0U

DC-5

MW-10 6.7

DC-6

MW-2 7.1

MW-1

DC-12 3.7

FORMER SEPTIC TANK

PHONE BOOTH

DC-10B 2.0U

DC-10A 41

DC-9A

DC-9B

MW-11 29

KMW-2 25

TREATMENT SYSTEM

FORMER LAUNDROMAT/ DRY CLEANER

MW-15 2.0U

KMW-9 4.0

DC-11 3.1

SIGN

CONDOMINIUMS

SD

SS

RETAINING WALL

MW-13 2.0U

DC-4 22

DC-3 2.9

DC-2 2.0U

DC-19 2.0U

FORMER DAIRY QUEEN

PARKING LOT

SECOND BUILDING (VARIOUS SHOPS)

FOUR STAR DRY CLEANERS

MW-4 11

DC-1 2.0U

MANHATTAN VILLAGE SHOPPING CENTER

BUILDING

?

MW-3 5.8

MW-12 2.0U

SUSPECTED SEPTIC TANK

QFC BUILDING

APPROXIMATE HARRIS PROPERTY BOUNDARY

APPROXIMATE MANHATTAN VILLAGE SHOPPING CENTER PROPERTY BOUNDARY

E UNDERGROUND ELECTRICAL UTILITY

G UNDERGROUND NATURAL GAS UTILITY

SS UNDERGROUND SEWER UTILITY

SD UNDERGROUND STORM DRAIN UTILITY

W UNDERGROUND WATER UTILITY

LEGEND

- PROPOSED PERMANGANATE INJECTION POINT, PHASE I
- PROPOSED PERMANGANATE INJECTION POINT, PHASE I AND PHASE II
- PROPOSED PERMANGANATE INJECTION POINT, PHASE II
- PROPOSED AIR SPARGE WELL
- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- ABANDONED, LOST OR DESTROYED MONITORING WELL
- 10 PCE CONCENTRATION CONTOUR (µg/L), APRIL 2012; DASHED WHERE INFERRED
- 2.0U / 3.1 / 11 TETRACHLOROETHENE (PCE) CONCENTRATION (µg/L); BOLDED VALUE INDICATES GREATER THAN DETECTION LEVEL AND LESS THAN CLEANUP LEVEL; BLUE SHADING INDICATES GREATER THAN CLEANUP LEVEL
- U NOT DETECTED AT METHOD DETECTION LIMIT

Figure 5

*Alternative 4*

*Air Sparge and Soil Vapor Extraction with Permanganate Injection Wells*

*MVSC/Harris Properties*

*Normandy Park, Washington*

ERM 09/12

*Tables*

**Table 1**

*Tetrachloroethene in Groundwater - Site History*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (µg/L) | Qualifiers |
|---|---|---|---|
| MW-1 | 4/11/2006 | **14** | |
| | 10/26/2006 | **11** | |
| | 4/25/2007 | **13** | |
| MW-2 | 4/5/2012 | **7.1** | |
| MW-3 | 4/14/2008 | **2.3** | |
| | 11/1/2010 | **2.9** | |
| | 5/31/2011 | <2 | |
| | 7/20/2011 | <2 | |
| | 10/18/2011 | **6.1** | |
| | 4/4/2012 | **5.8** | |
| MW-4 | 4/14/2008 | **32.6** | |
| | 3/9/2010 | **7.8** | |
| | 11/1/2010 | **16** | |
| | 5/31/2011 | **10** | |
| | 7/21/2011 | **25** | |
| | 10/19/2011 | **21** | |
| | 4/4/2012 | **11** | |
| MW-5 | 4/11/2008 | **0.5** | |
| | 4/2/2012 | <2 | |
| MW-6 | 4/15/2008 | <2 | |
| | 4/2/2012 | <2 | |
| MW-7 | 4/16/2008 | **22.4** | |
| | 4/2/2012 | **14** | |
| MW-8 | 8/21/2008 | **0.2** | J |
| | 4/2/2012 | <2 | |
| MW-9 | 8/21/2008 | **0.1** | J |
| | 4/2/2012 | <2 | |
| MW-9A | 11/2/2006 | **2.9** | |
| MW-10 | 2/8/2011 | **10.0** | |
| | 5/31/2011 | <2 | |
| | 7/20/2011 | **4.1** | |
| | 10/18/2011 | **4.9** | |
| | 4/6/2012 | **6.7** | |
| MW-11 | 2/8/2011 | **47.0** | |
| | 5/31/2011 | <2 | |
| | 7/20/2011 | <2 | |
| | 10/18/2011 | <2 | |
| | 4/6/2012 | **29** | |
| MW-12 | 4/4/2012 | <2 | |
| MW-13 | 4/3/2012 | <2 | |
| MW-14 | 4/5/2012 | <2 | |
| MW-15 | 4/5/2012 | <2 | |
| KMW-1 | 4/11/2006 | <1 | |
| | 10/26/2006 | <1 | |
| | 4/25/2007 | <0.2 | |
| | 4/14/2008 | <0.2 | |
| | 4/3/2012 | <2 | |
| KMW-2 | 6/12/2006 | **130** | |
| | 8/8/2006 | **130** | |
| | 10/26/2006 | **190** | J |
| | 4/24/2007 | **63** | |
| | 4/16/2008 | **95.8** | |
| | 3/8/2010 | **81** | |
| | 11/3/2010 | **74** | |
| | 6/1/2011 | **12** | |
| | 7/20/2011 | **44** | |
| | 10/19/2011 | **40** | |
| | 4/6/2012 | **25** | |
| KMW-3 | 6/12/2006 | **20** | |
| | 10/26/2006 | **13** | |
| | 4/24/2007 | **9.9** | |
| | 11/2/2010 | **11** | |
| | 5/31/2011 | **6.2** | |
| | 7/20/2011 | **12** | |
| | 10/18/2011 | **11** | |
| | 4/3/2012 | **6.8** | |

**Table 1**

*Tetrachloroethene in Groundwater - Site History*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (µg/L) | Qualifiers |
|---|---|---|---|
| KMW-4 | 4/25/2007 | **0.7** | |
| | 4/3/2012 | <2 | |
| KMW-5 | 4/25/2007 | **0.8** | |
| | 4/3/2012 | <2 | |
| KMW-5D | 4/25/2007 | <0.2 | |
| | 4/3/2012 | <2 | |
| KMW-6 | 4/24/2007 | **3.8** | |
| | 4/3/2012 | <2 | |
| KMW-7 | 4/24/2007 | **3.8** | |
| | 4/15/2008 | **3.9** | |
| | 11/3/2010 | <2 | |
| | 5/30/2011 | **2.3** | |
| | 7/20/2011 | <2 | |
| | 10/18/2011 | <2 | |
| | 4/3/2012 | **3.3** | |
| KMW-8 | 4/24/2007 | **11** | |
| | 4/15/2008 | **17.4** | |
| | 4/3/2012 | **10** | |
| KMW-9 | 4/26/2007 | **9.3** | |
| | 3/8/2010 | **4.4** | |
| | 11/4/2010 | **2.8** | |
| | 4/5/2012 | **4.0** | |
| DC-1 | 10/21/1998 | **0.6** | |
| | 2/3/1999 | ND[1] | |
| | 4/7/1999 | ND[1] | |
| | 12/8/1999 | ND[1] | |
| | 4/26/2000 | ND[1] | |
| | 8/3/2000 | ND[1] | |
| | 11/14/2000 | ND[1] | |
| | 3/6/2001 | ND[1] | |
| | 6/20/2001 | ND[1] | |
| | 9/17/2001 | ND[1] | |
| | 12/20/2001 | ND[1] | |
| | 3/13/2002 | ND[1] | |
| | 6/13/2002 | NS | |
| | 9/17/2002 | ND[1] | |
| | 12/10/2002 | ND[1] | |
| | 3/31/2003 | ND[1] | |
| | 9/3/2003 | ND[1] | |
| | 3/16/2004 | ND[1] | |
| | 9/7/2004 | ND[1] | |
| | 4/25/2007 | <0.2 | |
| | 4/4/2012 | <2 | |
| DC-2 | 10/21/1998 | **2.4** | |
| | 2/3/1999 | **0.7** | |
| | 4/7/1999 | ND[1] | |
| | 12/8/1999 | ND[1] | |
| | 4/26/2000 | ND[1] | |
| | 8/3/2000 | ND[1] | |
| | 11/14/2000 | ND[1] | |
| | 3/6/2001 | ND[1] | |
| | 6/20/2001 | ND[1] | |
| | 9/17/2001 | ND[1] | |
| | 12/20/2001 | ND[1] | |
| | 3/13/2002 | **4.0** | |
| | 6/13/2002 | ND[1] | |
| | 9/17/2002 | ND[1] | |
| | 12/10/2002 | **0.5** | J |
| | 3/31/2003 | **3.37** | |
| | 9/3/2003 | ND[1] | |
| | 3/16/2004 | **0.7** | J |
| | 9/7/2004 | ND[1] | |
| | 4/26/2007 | **1.2** | |
| | 4/14/2008 | **0.3** | |
| | 11/3/2010 | <2 | |
| | 5/31/2011 | <2 | |
| | 7/21/2011 | <2 | |
| | 10/18/2011 | <2 | |
| | 4/4/2012 | <2 | |

**Table 1**

*Tetrachloroethene in Groundwater - Site History*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (µg/L) | Qualifiers |
|---|---|---|---|
| DC-3 | 10/28/1998 | **54** | |
| | 2/4/1999 | **25** | |
| | 4/8/1999 | **36** | |
| | 12/8/1999 | **45** | |
| | 4/26/2000 | **56** | |
| | 8/3/2000 | **25** | |
| | 11/14/2000 | ND[1] | |
| | 3/6/2001 | **4.7** | |
| | 6/20/2001 | **2.8** | |
| | 9/17/2001 | ND[1] | |
| | 12/20/2001 | **9.2** | |
| | 3/13/2002 | **40** | |
| | 6/13/2002 | **42.3** | |
| | 9/17/2002 | **33.4** | |
| | 12/10/2002 | **5.4** | |
| | 3/31/2003 | **7.3** | |
| | 9/3/2003 | **2.1** | |
| | 3/16/2004 | ND[1] | |
| | 9/7/2004 | **3.4** | |
| | 4/26/2007 | **42** | |
| | 4/14/2008 | **27.8** | |
| | 3/9/2010 | <2 | |
| | 11/3/2010 | <2 | |
| | 5/30/2011 | **3.9** | |
| | 7/20/2011 | **12** | |
| | 10/18/2011 | **6.7** | |
| | 4/4/2012 | **2.9** | |
| DC-4 | 10/28/1998 | **227** | |
| | 2/4/1999 | **144** | |
| | 4/8/1999 | **110** | |
| | 12/8/1999 | **71** | |
| | 4/26/2000 | **120** | |
| | 8/3/2000 | **42** | |
| | 11/14/2000 | **64** | |
| | 3/6/2001 | **52** | |
| | 6/20/2001 | **40** | |
| | 9/17/2001 | **23** | |
| | 12/20/2001 | **15** | |
| | 3/13/2002 | **55** | |
| | 6/13/2002 | **17.9** | |
| | 9/17/2002 | **28.8** | |
| | 12/10/2002 | **22.4** | |
| | 3/31/2003 | **12.5** | |
| | 9/3/2003 | **14.1** | |
| | 3/16/2004 | **19.8** | |
| | 9/7/2004 | **18.5** | |
| | 4/26/2007 | **19** | |
| | 4/11/2008 | **30.2** | |
| | 3/9/2010 | **9.2** | |
| | 11/3/2010 | **13** | |
| | 5/31/2011 | <2 | |
| | 7/20/2011 | <2 | |
| | 10/18/2011 | **22** | |
| | 4/4/2012 | **22** | |
| DC-5 | 2/4/1999 | **2.4** | |
| | 4/8/1999 | **1.6** | |
| | 4/11/2006 | **1.3** | |
| | 4/26/2007 | **2.1** | |

**Table 1**

*Tetrachloroethene in Groundwater - Site History*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (µg/L) | Qualifiers |
|---|---|---|---|
| DC-6 | 2/4/1999 | **5.1** | |
| | 4/8/1999 | **3.7** | |
| DC-7 | 2/4/1999 | **74** | |
| | 4/8/1999 | **64** | |
| | 12/8/1999 | **107** | |
| | 4/26/2000 | **130** | |
| | 8/3/2000 | **50** | |
| | 11/14/2000 | **130** | |
| | 3/6/2001 | **140** | |
| | 6/20/2001 | **96** | |
| | 9/17/2001 | **81** | |
| | 12/20/2001 | **47** | |
| | 3/13/2002 | **31** | |
| | 6/13/2002 | **41.5** | |
| | 9/17/2002 | **77.7** | |
| | 12/10/2002 | **91.8** | |
| | 3/31/2003 | **40.1** | |
| | 9/3/2003 | **57.4** | |
| | 4/11/2006 | **23** | |
| | 10/26/2006 | **51** | |
| | 4/24/2007 | **27** | |
| | 4/16/2010 | **50.8** | |
| | 11/3/2010 | **34** | |
| | 6/1/2011 | **15** | |
| | 7/21/2011 | **38** | |
| | 10/18/2011 | **42** | |
| | 4/5/2012 | **18** | |
| DC-8 | 2/4/1999 | **56** | |
| | 4/8/1999 | **48** | |
| | 12/8/1999 | **98** | |
| | 4/26/2000 | **87** | |
| | 8/3/2000 | **70** | |
| | 11/14/2000 | **130** | |
| | 3/6/2001 | **82** | |
| | 6/20/2001 | **80** | |
| | 9/17/2001 | **62** | |
| | 12/20/2001 | **50** | |
| | 3/13/2002 | **31** | |
| | 6/13/2002 | **26.6** | |
| | 9/17/2002 | **38.4** | |
| | 12/10/2002 | **53.1** | |
| | 3/31/2003 | **36.4** | |
| | 9/3/2003 | **34.7** | |
| | 4/11/2006 | **14** | |
| | 10/26/2006 | **28** | |
| | 4/24/2007 | **24** | |
| | 4/16/2010 | **39.4** | |
| | 11/3/2010 | **25** | |
| | 6/1/2011 | **11** | |
| | 7/21/2011 | **25** | |
| | 10/19/2011 | **26** | |
| | 4/5/2012 | **18** | |

**Table 1**

*Tetrachloroethene in Groundwater - Site History*
*MVSC/Harris Properties*
*Normandy Park, Washington*

| Monitoring Well | Date Sampled | Tetrachloroethene (µg/L) | Qualifiers |
|---|---|---|---|
| DC-9A | 4/8/1999 | **135** | |
| | 12/8/1999 | **73** | |
| | 4/26/2000 | **240** | |
| | 8/3/2000 | **110** | |
| | 11/14/2000 | NS | |
| | 4/11/2006 | **78** | |
| | 8/8/2006 | **49** | |
| | 4/26/2007 | **33** | |
| DC-9B | 4/8/1999 | **1.4** | |
| | 3/6/2001 | **2.0** | |
| | 6/20/2001 | ND[1] | |
| | 9/17/2001 | ND[1] | |
| | 4/11/2006 | <1 | |
| | 8/8/2006 | <1 | |
| | 10/26/2006 | <1 | |
| | 4/26/2007 | <0.2 | |
| | 4/15/2008 | **0.6** | |
| DC-10A | 4/8/1999 | **150** [2] | |
| | 12/8/1999 | **73** | |
| | 4/26/2000 | **210** | |
| | 8/3/2000 | NS | |
| | 11/14/2000 | NS | |
| | 4/5/2012 | **41** | |
| DC-10B | 4/8/1999 | **1.9** | |
| | 3/6/2001 | **3.3** | |
| | 6/20/2001 | **2.4** | |
| | 9/17/2001 | ND[1] | |
| | 12/20/2001 | ND[1] | |
| | 4/11/2006 | <1 | |
| | 4/26/2007 | **0.3** | |
| | 11/3/2010 | **2.6** | |
| | 5/30/2011 | <2 | |
| | 7/19/2011 | <2 | |
| | 10/18/2011 | <2 | |
| | 4/6/2012 | <2 | |
| DC-11 | 4/26/2007 | **12** | |
| | 3/9/2010 | **4.6** | |
| | 11/1/2010 | **4.8** | |
| | 4/4/2012 | **3.1** | |
| DC-12 | 4/4/2012 | **3.7** | |
| DC-13 | 4/25/2007 | **15** | |
| | 4/16/2008 | **23** | |
| | 3/1/2010 | **10** | |
| | 11/2/2010 | **9.2** | |
| | 4/5/2012 | **6.4** | |
| DC-14 | 4/3/2012 | **11** | |
| DC-15 | 4/5/2012 | **20** | |
| DC-16 | 4/25/2007 | **0.4** | |
| | 11/5/2010 | <2 | |
| | 5/31/2011 | <2 | |
| | 7/19/2011 | <2 | |
| | 10/18/2011 | <2 | |
| | 4/6/2012 | <2 | |
| DC-17 | 4/25/2007 | **47** | |
| | 4/16/2008 | **74.6** | |
| | 11/3/2010 | **2.1** | |
| | 5/30/2011 | <2 | |
| | 7/19/2011 | <2 | |
| | 10/18/2011 | <2 | |
| | 4/6/2012 | <2 | |
| DC-18 | 4/25/2007 | **19** | |
| | 4/5/2012 | **7.2** | |
| DC-19 | 4/14/2008 | **0.7** | |
| | 4/4/2012 | <2 | |
| Model Toxics Control Act Method A Groundwater Cleanup Level | | 5.0 | |

**Notes:**

**Bold** entries indicate positive analyte detections.

Shaded cells indicate concentrations greater than the cleanup goal.

J = Estimated Value

ND = Not Detected

NS = Not Sampled

µg/l = micrograms per liter

[1]The detection limit is was not provided in SCS's data summary table, and the original laboratory report is not available.

[2]This value is reported as 135 micrograms per liter in the 2004 Annual Groundwater Report and 150 micrograms per liter in the 1999 Site Assessment both conducted by SCS. The original laboratory report is not available, so the concentration cannot be confirmed.

[3]RB-1 - RB-6 a0 HPDC-5 were reported in the SCS Environmental Site Assessment (1999) but were not labled on the associated figures, therfore have not been included in this summary table.

**Table 2**

*Remedial Technology Screening*
*Feasibility Study*
*Normandy Park, Washington*

| *Soil Remediation Technologies* | *Description* | *Comments* |
|---|---|---|
| No Action | No action. | • Retained for baseline comparison purposes. |
| Institutional Controls | Deed restrictions or other institutional controls to limit land use and minimize exposure to impacted soils. | • Not included in current alternatives because contamination is not removed. Could potentially incorporate in future closure actions. |
| Excavation | Impacted soil is excavated and transported off-site for disposal. Clean fill is imported and backfilled into the excavated area. | • Applies to nearly any contaminant and soil type.<br>• Potentially high excavation and disposal costs.<br>• Not retained due to onsite buildings and high commercial traffic on/near impacted area.<br>• 10+ feet of clean soil above PCE impacted zone. |
| Soil Washing | Impacted soil is excavated mixed with water-based washing solution to separate contaminants from coarse soil fraction. Soil is then separated into clean soils and contaminated fines. Clean soils are returned to excavation and fines are collected and disposed of. | • Significantly reduces the volume of soil required to be disposed of offsite (versus standard excavation).<br>• Applies to sites with sandy/gravelly soils with high hydraulic conductivities.<br>• Not retained due to onsite buildings and high commercial traffic on/near impacted area and large space requirement for treatment. |
| Stabilization | Physical mixing of additives with impacted soil to solidify contaminants (in-situ or ex-situ) or injection of reagents to chemically bind and immobilize contaminants. | • Is applicable to all soil types.<br>• Not retained, not generally applicable to VOCs. |
| Soil Vapor Extraction (SVE) | Wells installed with vacuum applied to the vadose zone to create negative pressure gradient and extract soil vapors with VOCs. Compounds are collected above ground and treated prior to discharge. | • Retained, can be paired with air sparging to enhance effectiveness of contaminant removal from groundwater by volatilizing VOCs for extraction.<br>• Requires above ground treatment system, aboveground infrastructure, and regular O&M. |
| Dual Phase Extraction (DPE) | Vacuum applied through extraction wells to saturated and unsaturated zones to create negative pressure gradient. Groundwater depression increases contaminant volatilization into soil-gas for extraction. | • Requires above ground treatment system, aboveground infrastructure, and regular O&M.<br>• Maximizes contaminant removal by increasing volatilization.<br>• Requires treated groundwater disposal.<br>• Not Retained; unneccesary and costly to collect soil vapors across entire site (soil impacts in limited area). |

**Table 2**

*Remedial Technology Screening*
*Feasibility Study*
*Normandy Park, Washington*

| *Groundwater Remedial Technologies* | *Description* | *Comments* |
|---|---|---|
| No Action | No Action. | • Retained for baseline comparison purposes. |
| Institutional Controls | Deed restrictions or other institutional controls to limit groundwater use and minimize exposure to impacted groundwater. | • Not included in current alternatives because contamination is not removed. Could potentially incorporate in future closure actions. |
| Monitored Natural Attenuation | Passive reduction of dissolved concentrations through naturally occurring processes such as dilution, dispersion, volatilization, biodegredation, or adsorption. | • Not retained; groundwater monitoring results suggest that aquifer conditions are not conducive to natural attenuation. |
| Air Sparging | Air is injected into the saturated zone to induce mechanical stripping and volatilization of contaminants in soil and groundwater. Introduction of oxygen also enhances aerobic biodegradation. Volatile compounds are recovered and treated by a vapor extraction system. | • Typically must be paired with SVE system to collect vapors<br>• Most effective on contaminants which aerobically degrade (e.g., BTEX, TPH); PCE and TCE do not degrade aerobically<br>• Requires above ground treatment system, aboveground infrastructure, and regular O&M<br>• Retained as possible technology in conjunction with SVE for soil and groundwater treatment. |
| In Situ Anaerobic Bioremediation | Injection of a carbon source (electron donor) material into the contaminated zone to stimulate degradation of polychlorinated VOCs through reductive dechlorination. Typical injectates include acetate, lactate, and emulsified oil substrates. Can be supplemented with addition of specific degrading microbes to enhance overall effectiveness. | • No permanent infrastructure required.<br>• Toxic byproducts can be produced if dechlorination is incomplete (e.g., vinyl chloride).<br>• Requires UIC permit.<br>• Success dictated by ability to achieve contact between injectate and contaminated groundwater.<br>• Multiple applications can be required for higher concentration areas.<br>• Not retained; can be challenging to implement at sites where strongly oxidizing conditions are present in the affected aquifer; no indication that significant biological degradation is occurring at Normandy Park site. |
| In Situ Chemical Oxidation | Injection of a dilute solution or gas of an oxidant such as potassium permanganate, ozone, sodium persulfate, or Fenton's Reagent into the contaminated zone to directly oxidize VOCs to alter contaminants to more stable, less hazardous compounds. | • No permanent infrastructure required.<br>• Chlorinated VOCs (e.g., PCE and TCE) are broken down completely.<br>• Requires UIC permit for injections.<br>• Multiple applications can be required for higher concentration areas.<br>• Uncontrolled releases can be toxic to environmental receptors.<br>• Can develop localized and temporary mobilization of dissolved metals.<br>• Bench testing shows soil oxidant demand (SOD) at Normandy Park site is low, and thus technology should be cost-effective to implement.<br>• Retained for ground water treatment in combination with soil treatment technology. |

**Table 2**

*Remedial Technology Screening*
*Feasibility Study*
*Normandy Park, Washington*

| *Groundwater Remedial Technologies* | *Description* | *Comments* |
|---|---|---|
| In Well Vapor Stripping | In-well aerators inject air into well and perform air stripping of groundwater within the well. Groundwater is not removed from the well, but is circulated between an upper and lower screen in the well. Volatile compounds transfer from groundwater to vapor phase and are recovered and treated by a vapor extraction system or reinjected into subsurface (DDC wells). Vapor treatment required at Normandy Park site due to chlorinated VOCs that do not aerobically degrade. | • Does not require UIC permit.<br>• Can effectively treat relatively high VOC concentrations.<br>• Typically applicable to higher concentration sites to justify capital cost.<br>• Permanent treatment wells and down-well treatment systems result in less flexible application than other in situ technologies.<br>• Potential for well screen clogging.<br>• Retained, no ex situ groundwater treatment required; no need to pump groundwater to surface. |
| Pump and Treat (P&T) | Groundwater pumped from extraction wells or trenches to on-site treatment system prior to disposal or re-injection. Objectives include removal of dissolved contaminants and hydraulic containment to prevent contaminant migration. | • Relatively higher cost technology (capital and O&M).<br>• Typically applicable to higher concentration sites to justify higher costs.<br>• Installed treatment wells and down-well treatment systems result in less flexible application than other in situ technologies.<br>• Potential for well screen clogging.<br>• Requires above ground treatment system, aboveground infrastructure, and regular O&M.<br>• Retained for ground water treatment in combination with soil treatment technology. |
| Dual Phase Extraction (DPE) | See description and comments in Soil Technologies section. | • Not retained. P&T technology targets groundwater extraction technology without soil gas removal (see comments in Soil Technologies section). |

**Notes:**

Shaded cells indicated remedial technology is retained for further consideration.

| | | |
|---|---|---|
| BTEX - benzene, toluene, ethene, xylene | PCE - tetrachloroethylene | TCE - trichloroethylene |
| DCE - dichloroethylene | SOD - soil oxidant demand | |
| DPE - dual phase extraction | SVE - soil vapor extraction | |
| O&M - operation and maintenance | UIC - underground injection control | |
| P&T - pump and treat | VOC - volatile organic compound | |

**Table 3**

*Remedial Alternatives Evaluation Matrix*

*Feasibility Study*

*Normandy Park, Washington*

| Proposed Alternatives | Protectiveness | Score | Permanence | Score | Cost | Score | Long-Term Effectiveness | Score | Short-Term Risk | Score | Implementability | Score | Public Concerns | Score | TOTAL SCORE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alternative 1:** No Action | • This alternative is not compliant with the applicable cleanup standards and therefore is not protective of human health and the environment | 0 | • Provides no reduction of contaminants through treatment. | 0 | • No cost. | 5 | • No actions are taken. Provides no long-term effectiveness or permanence. | 0 | • As no actions are taken, there would be no short-term risk to workers. | 5 | • As no actions are taken, this alternative is highly implementable. | 5 | • Potential public concerns not addressed by taking no actions. | 0 | **NS** |
| **Alternative 2:** Air Sparge (AS) with Soil Vapor Extraction (SVE) | • This alternative is expected to comply with cleanup standards and will be protective of human health and the environment | 4 | • Provides reduction of contaminants of impacted soil and groundwater through AS/SVE.<br>• Contaminants permanently removed from groundwater/vapor and transferred to solid media for offsite disposal.<br>Reduction of contaminants dependent on adequate distribution of air in subsurface, potential for localized untreated areas.<br>• Potential for insufficient contaminant reduction below MCLs.<br>• Irreversible process. | 3 | • Capital Costs = $368,880<br>• O&M (NPV) = $134,855<br>• Monitoring (NPV) = $363,288<br>• **TOTAL (NPV) =$1,128,000** | 3 | • AS/SVE is expected to provide effective reduction of groundwater and vapor contaminants by transfer of contaminants to vapor phase then extraction and ex-situ treatment by transferring to carbon media.<br>• Long-term O&M of extraction and treatment system may be required to achieve MCLs in groundwater. | 3 | • Poses little risk to potential local receptors (i.e. workers, public) during implementation.<br>• Limited risk of potential exposure to impacted groundwater/soil during implementation (can be mitigated with proper H&S awareness). | 4 | • Requires construction, and O&M of treatment system to implementing alternative.<br>• Materials and services need to implement alternative are readily available.<br>• Potential for long term operation to achieve cleanup goals.<br>• No UIC permit required. | 3 | • All active alternatives for reducing groundwater and soil contaminant levels should decrease potential public concerns about the existing site conditions. | 4 | **24.0** |
| **Alternative 3:** In Situ Chemical Oxidation using Potassium Permaganate with SVE (Source Area Only) | • This alternative is expected to comply with cleanup standards and will be protective of human health and the environment | 4 | • Provides reduction of contaminants in groundwater through injection of potassium permanganate and chemical destruction of PCE.<br>• Reduction of contaminants dependent on adequate distribution of chemical solution in subsurface, potential for localized untreated areas.<br>• Potential for rebound of contaminant levels.<br>• Irreversible process | 4 | •Capital Costs = $456,313<br>•O&M (NPV) = $118,843<br>•Monitoring (NPV) = $388,055<br>•**TOTAL (NPV) = $1,253,000** | 3 | • Initial SOD tests indicate site would be responsive to oxidation with potassium permanganate. Pilot testing confirmed effectiveness with subsurface conditions.<br>• Multiple rounds of injections are possible over 2 to 3 years. | 3.5 | • Uncontrolled releases can be toxic to environmental receptors, though no surface water bodies near Site.<br>• Can cause localized and temporary mobilization of dissolved metals<br>• Potential worker risk minimized with experienced staff and proper H&S awareness. | 3 | • Materials and services needed to implement alternative are readily available.<br>• Requires O&M of SVE system to implementing alternative.<br>No additional permanent infrastructure required onsite.<br>• Comparatively fast implementation schedule for groundwater treatment.<br>• UIC permit required (not anticipated to adversely impact schedule). | 4 | • All active alternatives for reducing groundwater and soil contaminant levels should decrease potential public concerns about the existing site conditions.<br>• Potential for negative public perception of injection of chemical into subsurface. | 3 | **24.5** |
| **Alternative 4:** AS/SVE (Source Area only) with In Situ Chemical Oxidation using Potassium Permaganate | • This alternative is expected to comply with cleanup standards and will be protective of human health and the environment | **4** | • Provides reduction of contaminants in impacted soil and groundwater through AS/SVE and chemical oxidation of PCE via injection of potassium permanganate.<br>• Contaminants permanently removed or destroyed from groundwater using AS/SVE or chemical oxidation, respectively.<br>Contaminants also removed from the unsaturated zone using SVE. Contaminates removed via AS/SVE are transferred to solid media for offsite disposal.<br>Reduction of contaminants dependent on adequate distribution of sparged air and chemical solution in subsurface, potential for localized untreated areas<br>Potential for rebound of contaminant levels<br>Irreversible process. | **4** | •Capital Costs = $496,670<br>•O&M (NPV) = $123,736<br>•Monitoring (NPV) = $388,055<br>•**TOTAL (NPV) = $1,311,000** | 3 | • AS/SVE is expected to provide effective reduction of groundwater and vapor contaminants by transfer of contaminants to vapor phase then extraction and ex-situ treatment by transferring to carbon media.<br>Initial SOD tests indicate site would be responsive to oxidation with potassium permanganate. Pilot testing confirmed effectiveness with subsurface conditions.<br>• Long-term O&M of extraction and treatment system to achieve MCLs in groundwater will most likely be minimized due to the addition of potassium permanganate to the subsurface.<br>Multiple rounds of injections are possible over 2 to 3 years. | 4.5 | • AS/SVE poses little risk to potential local receptors (i.e. workers, public) during implementation and limited risk of potential exposure to impacted groundwater/soil during implementation (can be mitigated with proper H&S awareness).<br>Uncontrolled releases of potassium permanganate can be toxic to environmental receptors, though no surface water bodies near Site. Potassium permangante can cause localized and temporary mobilization of dissolved metals. Potential worker risk minimized with experienced staff and proper H&S awareness. | 3 | • Requires construction, and O&M of treatment system to implement alternative.<br>• Materials and services need to implement alternative are readily available.<br>• Potential for long term operation to achieve cleanup goals.<br>UIC permit required (not anticipated to adversely impact schedule. | 4 | • All active alternatives for reducing groundwater and soil contaminant levels should decrease potential public concerns about the existing site conditions. Potential for negative public perception of injection of chemical into subsurface. | 3.5 | **26.0** |
| **Alternative 5:** In Situ Chemical Oxidation using Ozone Sparging with Potassium Permangante | • This alternative is expected to comply with cleanup standards and will be protective of human health and the environment | **4** | • Provides reduction of contaminants in impacted soil and groundwater through chemical oxidation of PCE via ozone sparging and injection of potassium permanganate.<br>• Contaminants permanently destroyed from groundwater using chemical oxidation.<br>Reduction of contaminants dependent on adequate distribution of sparged air and potassium permanganate in subsurface, potential for localized untreated areas<br>Irreversible process. | **4** | •Capital Costs = $567,438<br>•O&M (NPV) = $169,022<br>•Monitoring (NPV) = $388,055<br>•**TOTAL (NPV) = $1,462,000** | **2.5** | Initial SOD tests indicate site would be responsive to oxidation with ozone and potassium permanganate. Potassium permanganate pilot testing confirmed effectiveness with subsurface conditions. Multiple rounds of injections are possible site wide and for high contaminant levels over long term. | **4.5** | • Ozone poses moderate to severe risk to potential local receptors (i.e. workers, public) during implementation. However, this can generally be mitigated with proper H&S awareness and engineering controls.<br>Uncontrolled releases of potassium permanganate can be toxic to environmental receptors, though no surface water bodies near Site. Potassium permangante can cause localized and temporary mobilization of dissolved metals. Potential worker risk minimized with experienced staff and proper H&S awareness. | **2.5** | • Requires construction, and O&M of treatment system to implement alternative.<br>• Materials and services need to implement alternative are readily available.<br>• UIC permit required (not anticipated to adversely impact schedule. | 4 | • All active alternatives for reducing groundwater and soil contaminant levels should decrease potential public concerns about the existing site conditions. Potential for negative public perception of injection of chemical into subsurface and impacts to indoor air. | 2.5 | **24.0** |

**Table 3**
*Remedial Alternatives Evaluation Matrix*
*Feasibility Study*
*Normandy Park, Washington*

| Proposed Alternatives | Protectiveness | Score | Permanence | Score | Cost | Score | Long-Term Effectiveness | Score | Short-Term Risk | Score | Implementability | Score | Public Concerns | Score | TOTAL SCORE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alternative 6:** In Well Vapor Stripping | • This alternative is expected to comply with cleanup standards and will be protective of human health and the environment | 4 | • Provides reduction of impacted groundwater and vapor phase through treatment by in-well stripping<br>• Contaminants are permanently removed from subsurface and transferred to solid media for offsite disposal.<br>• Potential for insufficient contaminant reductions below MCLs<br>• Irreversible process | 3.5 | •Capital Costs = $1,035,015<br>•O&M (NPV) = $98,118<br>•Monitoring (NPV) = $205,407<br>•**TOTAL (NPV) = $1,741,000** | 2 | • In well stripping is expected to provide effective reduction of groundwater and vapor contaminants by transfer of contaminants to vapor phase then extraction and ex-situ treatment by transferring to carbon media.<br>• Long-term O&M of extraction and treatment system may be required to achieve MCLs in groundwater. | 4 | • Poses little risk to potential local receptors (i.e. workers, public) during implementation.<br>• Limited risk of potential exposure to impacted groundwater/soil during implementation (can be mitigated with proper H&S awareness) | 4 | • Requires construction, and O&M of treatment system to implement alternative.<br>• Materials and services need to implement alternative are readily available.<br>• Potential for long term operation to achieve cleanup goals.<br>• No UIC permit required. | 3 | • All active alternatives for reducing groundwater and soil contaminant levels should decrease potential public concerns about the existing site conditions. | 4 | **24.5** |
| **Alternative 7:** Pump and Treat with Soil Vapor Extraction | • This alternative is expected to comply with cleanup standards and will be protective of human health and the environment | 4 | • Provides reduction of contaminants in impacted groundwater through extraction and ex-situ treatment<br>• Contaminants permanently removed from groundwater and transferred to solid media for offsite disposal rather than destroyed in-situ<br>• Potential for insufficient contaminant reductions below MCLs<br>• Irreversible process | 3.5 | •Capital Costs = $751,650<br>•O&M (NPV) = $1,006,356<br>•Monitoring (NPV) = $213,254<br>•**TOTAL (NPV) = $2,563,000** | 1 | • Pump and treat is expected to provide effective reduction of groundwater and vapor contaminants by transfer of contaminants to carbon media.<br>• Long-term O&M of extraction and treatment system may be required to achieve MCLs in groundwater. | 4 | • Poses little risk to potential local receptors (i.e. workers, public) during implementation.<br>• Limited risk of potential exposure to impacted groundwater/soil during implementation (can be mitigated with proper H&S awareness). | 4 | • Requires construction, and O&M of treatment system to implement alternative.<br>• Materials and services need to implement alternative are readily available.<br>• Potential for long term operation to achieve cleanup goals.<br>• No UIC permit required.<br>• Sanitary sewer discharge approval required based on contaminant loading and hydraulic capacity of existing system. | 3 | • All active alternatives for reducing groundwater and soil contaminant levels should decrease potential public concerns about the existing site conditions. | 4 | **23.5** |

**Notes:**
AS = Air Sparge
H&S = Health and Safety
MCL = Maximum Contaminant Level
NPV = Net Present Value
NS = Not Scored
O&M = Operation and Maintenance
SOD - Soil Oxidant Demand
SVE = Soil Vapor Extraction
UIC = Underground Injection Control
VOC = Volatile Organic Compound

# *Appendix A*
# *Costing of Remedial Alternatives*

**Summary of Feasibility Study Costs Associated with Remedial Alternatives**
**Feasibility Study**
**Normandy Park, Washington**

| Remedial Alternative | Description | Direct and Indirect Capital Costs | NPW of Total O&M Costs | NPW of Total Monitoring Costs | Estimated Total Cost |
|---|---|---|---|---|---|
| Alternative 1 | No Action | $ - | $ - | $ - | $ - |
| Alternative 2 | Site-wide Soil Vapor Extraction with Air Sparging | $ 368,880 | $ 134,855 | $ 363,288 | $ 1,128,000 |
| Alternative 3 | Source Area Soil Vapor Extraction with Site-wide Chemical Oxidation using Permanganate | $ 456,313 | $ 118,843 | $ 388,055 | $ 1,253,000 |
| Alternative 4 | Source Area Soil Vapor Extraction with Air Sparging and Downgradient Chemical Oxidation using Permanganate | $ 496,670 | $ 123,736 | $ 388,055 | $ 1,311,000 |
| Alternative 5 | Source Area Soil Vapor Extraction with Ozone Sparging and Downgradient Chemical Oxidation using Permanganate | $ 567,438 | $ 169,022 | $ 388,055 | $ 1,462,000 |
| Alternative 6 | Site-wide Well Stripping | $ 1,035,015 | $ 98,118 | $ 205,407 | $ 1,741,000 |
| Alternative 7 | Site-wide Pump and Treat with Soil Vapor Extraction | $ 751,650 | $ 1,006,356 | $ 213,254 | $ 2,563,000 |

**Notes:**

**Feasibility costs only (includes 30% contingency). Do not use for design.**

(1) Present worth calculated using equal series present worth analysis where i = 7 %

(2) Confirmation sampling, reporting, and system decommissioning costs not included.

**Alternative 2- AS/SVE**
**Feasibility Study**
**Normandy Park, Washington**

| DESCRIPTION | QUANTITY Number | Unit | COST Unit Cost | Total Cost |
|---|---|---|---|---|
| ***DIRECT CAPITAL COSTS*** | | | | |
| **Site Preparation** | | | | |
| Remedial Design/Workplan | 1 | each | $ 12,500.00 | $ 12,500.00 |
| Boring Permits (includes grout inspections) | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| Utility Clearance | 1 | lump sum | $ 750.00 | $ 750.00 |
| Clearing and Grubbing | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| **AS/SVE System Construction** | | | | |
| Air Knife | 1 | lump sum | $ 14,000.00 | $ 14,000.00 |
| HSA Drill Rig Mob/Demob | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| North AS Wells Installation (includes well heads) | 6 | each | $ 1,150.00 | $ 6,900.00 |
| North SVE Wells Installation (includes well heads) | 10 | each | $ 2,000.00 | $ 20,000.00 |
| South AS Wells Installation (includes well heads) | 12 | each | $ 1,500.00 | $ 18,000.00 |
| South SVE Wells Installation (includes well heads) | 11 | each | $ 2,500.00 | $ 27,500.00 |
| North and South AS/SVE Piping and Trenching (includes labor) | 2100 | linear foot | $ 35.00 | $ 73,500.00 |
| North Concrete Slab (15' x 30' x 8") | 450 | square foot | $ 10.00 | $ 4,500.00 |
| North Equipment Bldg. | 1 | each | $ 12,000.00 | $ 12,000.00 |
| North AS Compressor (60 scfm, 12" pressure) | 1 | each | $ 8,000.00 | $ 8,000.00 |
| North AS Valves, Fittings, Appurtenances | 18 | well | $ 230.00 | $ 4,140.00 |
| North SVE Valves, Fittings, and Appurtenances | 21 | well | $ 300.00 | $ 6,300.00 |
| North SVE Blower (60 scfm) | 1 | each | $ 13,000.00 | $ 13,000.00 |
| North SVE Knockout Tank | 1 | each | $ 6,000.00 | $ 6,000.00 |
| North SVE Liquid Transfer Pump | 1 | each | $ 1,500.00 | $ 1,500.00 |
| North SVE Liquid Storage Tank | 1 | each | $ 2,000.00 | $ 2,000.00 |
| North SVE Liquid Bag Filter | 0 | each | $ 2,500.00 | $ - |
| North SVE Liquid GAC Unit | 1 | each | $ 4,000.00 | $ 4,000.00 |
| North System Telemetry | 1 | each | $ 2,500.00 | $ 2,500.00 |
| South AS Compressor (120 scfm, 12" pressure) | 1 | each | $ 12,000.00 | $ 12,000.00 |
| South AS Valves, Fittings, Appurtenances | 18 | well | $ 230.00 | $ 4,140.00 |
| South SVE Valves, Fittings, and Appurtenances | 21 | well | $ 300.00 | $ 6,300.00 |
| South SVE Liquid Bag Filter | 0 | each | $ 2,500.00 | $ - |
| South SVE Liquid GAC Unit | 1 | each | $ 4,000.00 | $ 4,000.00 |
| South System Telemetry | 1 | each | $ 2,500.00 | $ 2,500.00 |
| Treatment System Installation Labor (crew of 3, 1 wk) | 150 | hour | $ 110.00 | $ 16,500.00 |
| Electrical Drop | 1 | lump sum | $ 5,000.00 | $ 5,000.00 |
| Surveying | 2 | day | $ 2,000.00 | $ 4,000.00 |
| Permit to Discharge Treated SVE Liquid | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| **SUBTOTAL** | | | | **$ 267,280.00** |
| ***TOTAL DIRECT CAPITAL COSTS*** | | | | ***$ 267,280.00*** |
| ***INDIRECT CAPITAL COSTS*** | | | | |
| Engineering and Construction Oversight (25% Total Direct Costs) | 1 | lump sum | $ 66,820.00 | $ 66,820.00 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 8,018.40 | $ 8,018.40 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 26,728.00 | $ 26,728.00 |
| **TOTAL INDIRECT CAPITAL COSTS** | | | | **$ 101,600.00** |
| ***TOTAL CAPITAL COSTS (Direct and Indirect)*** | | | | ***$ 368,880.00*** |
| ***O & M COSTS*** | | | | |
| **System Operations Costs** | | | | |
| Electricity | 12 | monthly | $ 1,200.00 | $ 14,400.00 |
| Water Transport/Disposal | 4 | each | $ 3,750.00 | $ 15,000.00 |
| System Maintenance Labor | 138 | hour | $ 105.00 | $ 14,490.00 |
| Field Equipment | 15 | visit | $ 450.00 | $ 6,750.00 |
| O&M Reporting for Air Permit | 4 | quarterly | $ 2,500.00 | $ 10,000.00 |
| **SUBTOTAL** | | | | **$ 60,640.00** |
| Maintenance/Repair Costs (10% Total Direct Costs) | 1 | lump sum | $ 6,064.00 | $ 6,064.00 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 1,819.20 | $ 1,819.20 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 6,064.00 | $ 6,064.00 |
| **SUBTOTAL** | | | | **$ 13,947.20** |
| **ANNUAL O&M COSTS** | | | | **$ 74,587.20** |
| *STARTUP AND MONITORING COSTS* | | | | |
| Startup and Sampling Labor (included under O&M) | | | | |
| Air Monitoring - VOCs | 69 | samples | $ 275.00 | $ 18,975.00 |
| Air Monitoring - Well Head System Optimization | 42 | samples | $ 275.00 | $ 11,550.00 |
| **Ground Water Monitoring Cost Per Event** | | | | |
| Well Sampling Labor and Equipment | 40 | wells | $ 425.00 | $ 17,000.00 |
| Ground Water Analysis - VOCs (20 wells + 30% QA/QC) | 52 | samples | $ 120.00 | $ 6,240.00 |
| Reporting | 1 | lump sum | $ 5,000.00 | $ 5,000.00 |
| **SUBTOTAL** | | | | **$ 28,240.00** |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 847.20 | $ 847.20 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 2,824.00 | $ 2,824.00 |
| **SUBTOTAL** | | | | **$ 3,671.20** |
| **Total Costs Per Event** | | | | **$ 31,911.20** |
| **Annual O&M Cost** | | | | **$ 74,587.20** |
| **Annual Monitoring Cost , Year 1** | | | | **$ 146,619.80** |
| **Annual Monitoring Cost, Year 2** | | | | **$ 139,194.80** |
| **Annual Monitoring Cost, Year 3** | | | | **$ 127,644.80** |
| **SUBTOTAL NET PRESENT WORTH O&M COSTS (2 years) (1)** | | | | **$ 134,855** |
| **UBTOTAL NET PRESENT WORTH MONITORING COSTS (3 years) (1)** | | | | **$ 363,288** |
| ***TOTAL CAPITAL, MONITORING, AND O&M COSTS*** | | | | ***$ 867,023*** |
| General Contingency (30% of Total Capital and O&M Costs) | | | | ***$ 260,107*** |
| ***TOTAL COST OF ALTERNATIVE (PRESENT WORTH)*** | | | | ***$ 1,128,000*** |

**Notes:**
**Feasibility costs only (includes 30% contingency). Do not use for design.**
Current south remediation system includes SVE skid package, select SVE wells, and vapor monitoring points.
(1) Present worth calculated using equal series present worth analysis where i = 7 %

**Alternative 3- Permanganate with SVE**
**Feasibility Study**
**Normandy Park, Washington**

| DESCRIPTION | QUANTITY Number | Unit | COST Unit Cost | Total Cost |
|---|---|---|---|---|
| ***DIRECT CAPITAL COSTS*** | | | | |
| **Site Preparation** | | | | |
| Remedial Design/Workplan | 1 | each | $ 15,000.00 | $ 15,000.00 |
| Boring Permits (includes grout inspections) | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| Utility Clearance | 1 | lump sum | $ 750.00 | $ 750.00 |
| Clearing and Grubbing | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| **Phase 1 Chemical Oxidant Injections** | | | | |
| *Subcontractor, Materials, and Equipment* | | | | |
| Air Knife | 6 | day | $ 2,000.00 | $ 12,000.00 |
| DPT Mobilization/Demobilization | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| DPT Rig | 13 | day | $ 2,500.00 | $ 31,250.00 |
| Injection Trailer Mobilization/Demobilization | 1 | lump sum | $ 3,000.00 | $ 3,000.00 |
| Injection Trailer Rental | 3 | week | $ 1,750.00 | $ 5,250.00 |
| Potassium Permanganate (30 injections, 3,000 gal per point, includes transport) | 90,000 | gallon | $ 0.87 | $ 78,300.00 |
| Injection Equipment and Consumables | 1 | lump sum | $ 15,000.00 | $ 15,000.00 |
| **Phase 2 Chemical Oxidant Injections** | | | | |
| *Subcontractor, Materials, and Equipment* | | | | |
| Air Knife | 6 | day | $ 2,000.00 | $ 12,000.00 |
| DPT Mobilization/Demobilization | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| DPT Rig | 9 | day | $ 2,500.00 | $ 23,437.50 |
| Injection Trailer Mobilization/Demobilization | 1 | lump sum | $ 3,000.00 | $ 3,000.00 |
| Injection Trailer Rental | 2 | week | $ 1,750.00 | $ 3,500.00 |
| Potassium Permanganate (30 injections, 15 source area wells at 1,500 gal and 15 downgradient at 3,000 gal per point, includes transport) | 67,500 | gallon | $ 0.87 | $ 58,725.00 |
| Injection Equipment and Consumables | 1 | lump sum | $ 10,000.00 | $ 10,000.00 |
| **SVE System Upgrade** | | | | |
| South SVE Liquid Bag Filter | 1 | each | $ 2,500.00 | $ 2,500.00 |
| South SVE Liquid GAC Unit | 1 | each | $ 4,000.00 | $ 4,000.00 |
| South System Telemetry | 1 | each | $ 2,500.00 | $ 2,500.00 |
| SVE System Upgrade Labor (crew of 3, 1 day) | 30 | hour | $ 110.00 | $ 3,300.00 |
| Electrician | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| Permit to Discharge Treated SVE Liquid | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| ***TOTAL DIRECT CAPITAL COSTS*** | | | | ***$ 292,512.50*** |
| ***INDIRECT CAPITAL COSTS*** | | | | |
| Engineering and Construction Oversight (25% Total Direct Costs) | 1 | lump sum | $ 73,128.13 | $ 73,128.13 |
| Injection Labor (18% Total Direct Costs) | 1 | lump sum | $ 52,652.25 | $ 52,652.25 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 8,775.38 | $ 8,775.38 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 29,251.25 | $ 29,251.25 |
| **TOTAL INDIRECT CAPITAL COSTS** | | | | **$ 163,800.00** |
| ***TOTAL CAPITAL COSTS (Direct and Indirect)*** | | | | ***$ 456,313*** |
| ***O & M COSTS*** | | | | |
| Electricity | 12 | monthly | $ 600.00 | $ 7,200.00 |
| Water Transport/Disposal | 4 | each | $ 3,750.00 | $ 15,000.00 |
| System Maintenance Labor | 138 | hour | $ 105.00 | $ 14,490.00 |
| Field Equipment | 15 | visit | $ 450.00 | $ 6,750.00 |
| O&M Reporting for Air Permit | 4 | quarterly | $ 2,500.00 | $ 10,000.00 |
| **SUBTOTAL** | | | | **$ 53,440.00** |
| Maintenance/Repair Costs (10% Total Direct Costs) | 1 | lump sum | $ 5,344.00 | $ 5,344.00 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 1,603.20 | $ 1,603.20 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 5,344.00 | $ 5,344.00 |
| **SUBTOTAL** | | | | **$ 12,291.20** |
| **ANNUAL O&M COSTS** | | | | **$ 65,731.20** |
| *STARTUP AND MONITORING COSTS* | | | | |
| Startup and Sampling Labor (included under O&M) | | | | |
| Air Monitoring - VOCs | 69 | samples | $ 210.00 | $ 14,490.00 |
| Air Monitoring - Well Head System Optimization | 42 | samples | $ 210.00 | $ 8,820.00 |
| **Ground Water Monitoring Cost Per Event** | | | | |
| Well Sampling Labor and Equipment | 40 | wells | $ 425.00 | $ 17,000.00 |
| Ground Water Analysis - VOCs (20 wells + 30% QA/QC) | 52 | samples | $ 120.00 | $ 6,240.00 |
| Ground Water Analysis - Metals (20 wells + 30% QA/QC) | 52 | samples | $ 51.00 | $ 2,652.00 |
| Reporting | 1 | lump sum | $ 5,000.00 | $ 5,000.00 |
| **SUBTOTAL** | | | | **$ 30,892.00** |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 926.76 | $ 926.76 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 3,089.20 | $ 3,089.20 |
| **SUBTOTAL** | | | | **$ 4,015.96** |
| **Total Costs Per Event** | | | | **$ 34,907.96** |
| **Annual O&M Cost** | | | | **$ 65,731.20** |
| **Annual Monitoring Cost , Year 1** | | | | **$ 154,121.84** |
| **Annual Monitoring Cost, Year 2** | | | | **$ 148,451.84** |
| **Annual Monitoring Cost, Year 3** | | | | **$ 139,631.84** |
| **SUBTOTAL NET PRESENT WORTH O&M COSTS (2 years)** (1) | | | | **$ 118,843** |
| **SUBTOTAL NET PRESENT WORTH MONITORING COSTS (3 years)** (1) | | | | **$ 388,055** |
| ***TOTAL CAPITAL, MONITORING, AND O&M COSTS*** | | | | ***$ 963,210.50*** |
| General Contingency (30% of Total Capital and O&M Costs) | | | | ***$ 288,963.15*** |
| ***TOTAL COST OF ALTERNATIVE (PRESENT WORTH)*** | | | | ***$ 1,253,000.00*** |

**Notes:**
**Feasibility costs only (includes 30% contingency). Do not use for design.**
An SVE skid package, select SVE wells, and vapor monitoring points are part of the current onsite remediation system south of 178th Street.
(1) Present worth calculated using equal series present worth analysis where i = 7 %

**Alternative 4 - AS/SVE with Permanganate**
**Feasibility Study**
**Normandy Park, Washington**

| DESCRIPTION | QUANTITY Number | Unit | COST Unit Cost | Total Cost |
|---|---|---|---|---|
| ***DIRECT CAPITAL COSTS*** | | | | |
| **Site Preparation** | | | | |
| Remedial Design/Workplan | 1 | each | $ 17,500.00 | $ 17,500.00 |
| Boring Permits (includes grout inspections) | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| Utility Clearance | 1 | lump sum | $ 750.00 | $ 750.00 |
| Clearing and Grubbing | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| **Phase 1 Chemical Oxidant Injections** | | | | |
| *Subcontractor, Materials, and Equipment* | | | | |
| Air Knife | 3 | day | $ 2,000.00 | $ 6,000.00 |
| DPT Mobilization/Demobilization | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| DPT Rig | 6 | day | $ 2,500.00 | $ 15,625.00 |
| Injection Trailer Mobilization/Demobilization | 1 | lump sum | $ 3,000.00 | $ 3,000.00 |
| Injection Trailer Rental | 1 | week | $ 1,750.00 | $ 1,750.00 |
| Potassium Permanganate (16 injections, 3,000 gal per point, includes transport) | 45,000 | gallon | $ 0.87 | $ 39,200.00 |
| Injection Equipment and Consumables | 1 | lump sum | $ 10,000.00 | $ 10,000.00 |
| **Phase 2 Chemical Oxidant Injections** | | | | |
| *Subcontractor, Materials, and Equipment* | | | | |
| Air Knife | 6 | day | $ 2,000.00 | $ 12,000.00 |
| DPT Mobilization/Demobilization | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| DPT Rig | 14 | day | $ 2,500.00 | $ 34,375.00 |
| Injection Trailer Mobilization/Demobilization | 1 | lump sum | $ 3,000.00 | $ 3,000.00 |
| Injection Trailer Rental | 2 | week | $ 1,750.00 | $ 3,500.00 |
| Potassium Permanganate (33 injections, 5 source area wells at 3,000 gal and 28 downgradient wells at 3,000 gal per point, includes transport) | 99,000 | gallon | $ 0.87 | $ 86,130.00 |
| Injection Equipment and Consumables | 1 | lump sum | $ 10,000.00 | $ 10,000.00 |
| **AS System Construction and SVE System Upgrade** | | | | |
| Air Knife | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| HSA Drill Rig Mob/Demob | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| South AS Wells Installation (includes well heads) | 5 | each | $ 2,000.00 | $ 10,000.00 |
| South AS Piping and Trenching (includes labor) | 600 | linear feet | $ 35.00 | $ 21,000.00 |
| South AS Compressor (75 scfm, 12" pressure) | 1 | each | $ 7,500.00 | $ 7,500.00 |
| South AS Valves, Fittings, Appurtenances | 18 | well | $ 230.00 | $ 4,140.00 |
| South SVE Liquid Bag Filter | 1 | each | $ 2,500.00 | $ 2,500.00 |
| South SVE Liquid GAC Unit | 1 | each | $ 4,000.00 | $ 4,000.00 |
| South System Telemetry | 1 | each | $ 2,500.00 | $ 2,500.00 |
| Treatment System Installation (crew of 3, 3 days) | 90 | hour | $ 110.00 | $ 9,900.00 |
| Electrical Drop | 1 | lump sum | $ 2,500.00 | $ 2,500.00 |
| Surveying | 1 | day | $ 1,000.00 | $ 1,000.00 |
| Permit to Discharge Treated SVE Liquid | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| **SUBTOTAL** | | | | **$ 318,370.00** |
| ***TOTAL DIRECT CAPITAL COSTS*** | | | | ***$ 318,370.00*** |
| ***INDIRECT CAPITAL COSTS*** | | lump sum | | |
| Engineering and Construction Oversight (25% Total Direct Costs) | 1 | lump sum | $ 79,592.50 | $ 79,592.50 |
| Injection Labor (18% Total Direct Costs) | 1 | lump sum | $ 57,306.60 | $ 57,306.60 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 9,551.10 | $ 9,551.10 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 31,837.00 | $ 31,837.00 |
| **TOTAL INDIRECT CAPITAL COSTS** | | | | **$ 178,300.00** |
| ***TOTAL CAPITAL COSTS (Direct and Indirect)*** | | | | ***$ 496,670*** |
| ***O & M COSTS*** | | | | |
| **System Operations Costs** | | | | |
| Electricity | 12 | monthly | $ 1,200.00 | $ 14,400.00 |
| Water Transport/Disposal | 4 | each | $ 2,500.00 | $ 10,000.00 |
| System Maintenance Labor | 138 | hour | $ 105.00 | $ 14,490.00 |
| Field Equipment | 15 | visit | $ 450.00 | $ 6,750.00 |
| O&M Reporting for Air Permit | 4 | quarterly | $ 2,500.00 | $ 10,000.00 |
| **SUBTOTAL** | | | | **$ 55,640.00** |
| Maintenance/Repair Costs (10% Total Direct Costs) | 1 | lump sum | $ 5,564.00 | $ 5,564.00 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 1,669.20 | $ 1,669.20 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 5,564.00 | $ 5,564.00 |
| **SUBTOTAL** | | | | **$ 12,797.20** |
| **ANNUAL O&M COSTS** | | | | **$ 68,437.20** |
| *STARTUP AND MONITORING COSTS* | | | | |
| Startup and Sampling Labor (included under O&M) | | | | |
| Air Monitoring - VOCs | 69 | samples | $ 210.00 | $ 14,490.00 |
| Air Monitoring - Well Head System Optimization | 42 | samples | $ 210.00 | $ 8,820.00 |
| **Ground Water Monitoring Cost Per Event** | | | | |
| Well Sampling Labor and Equipment | 40 | wells | $ 425.00 | $ 17,000.00 |
| Ground Water Analysis - VOCs (20 wells + 30% QA/QC) | 52 | samples | $ 120.00 | $ 6,240.00 |
| Ground Water Analysis - Metals (20 wells + 30% QA/QC) | 52 | samples | $ 51.00 | $ 2,652.00 |
| Reporting | 1 | lump sum | $ 5,000.00 | $ 5,000.00 |
| **SUBTOTAL** | | | | **$ 30,892.00** |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 926.76 | $ 926.76 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 3,089.20 | $ 3,089.20 |
| **SUBTOTAL** | | | | **$ 4,015.96** |
| **Total Costs Per Event** | | | | **$ 34,907.96** |
| **Annual O&M Cost** | | | | **$ 68,437.20** |
| **Annual Monitoring Cost , Year 1** | | | | **$ 154,121.84** |
| **Annual Monitoring Cost, Year 2** | | | | **$ 148,451.84** |
| **Annual Monitoring Cost, Year 3** | | | | **$ 139,631.84** |
| **SUBTOTAL NET PRESENT WORTH O&M COSTS (2 years) (1)** | | | | **$ 123,736** |
| **JBTOTAL NET PRESENT WORTH MONITORING COSTS (3 years) (1)** | | | | **$ 388,055** |
| ***TOTAL CAPITAL, MONITORING, AND O&M COSTS*** | | | | ***$ 1,008,460.50*** |
| General Contingency (30% of Total Capital and O&M Costs) | | | | ***$ 302,538.15*** |
| ***TOTAL COST OF ALTERNATIVE (PRESENT WORTH)*** | | | | ***$ 1,311,000.00*** |

**Notes:**
**Feasibility costs only (includes 30% contingency). Do not use for design.**
An SVE skid package, select SVE wells, and vapor monitoring points are part of the current onsite remediation system south of 178th Street.
(1) Present worth calculated using equal series present worth analysis where i = 7 %

**Alternative 5- SVE with Ozone**
**Feasibility Study**
**Normandy Park, Washington**

| DESCRIPTION | QUANTITY Number | Unit | COST Unit Cost | Total Cost |
|---|---|---|---|---|
| ***DIRECT CAPITAL COSTS*** | | | | |
| **Site Preparation** | | | | |
| Remedial Design/Workplan | 1 | each | $ 20,000.00 | $ 20,000.00 |
| Boring Permits (includes grout inspections) | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| Utility Clearance | 1 | lump sum | $ 750.00 | $ 750.00 |
| Clearing and Grubbing | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| **Phase 1 Chemical Oxidant Injections** | | | | |
| *Subcontractor, Materials, and Equipment* | | | | |
| Air Knife | 3 | day | $ 2,000.00 | $ 6,000.00 |
| DPT Mobilization/Demobilization | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| DPT Rig | 6 | day | $ 2,500.00 | $ 15,625.00 |
| Injection Trailer Mobilization/Demobilization | 1 | lump sum | $ 3,000.00 | $ 3,000.00 |
| Injection Trailer Rental | 2 | week | $ 1,750.00 | $ 3,500.00 |
| Potassium Permanganate (15 injections, 3,000 gal per point, includes transport) | 45,000 | gallon | $ 0.87 | $ 39,200.00 |
| Injection Equipment and Consumables | 1 | lump sum | $ 10,000.00 | $ 10,000.00 |
| **Phase 2 Chemical Oxidant Injections** | | | | |
| *Subcontractor, Materials, and Equipment* | | | | |
| Air Knife | 6 | lump sum | $ 2,000.00 | $ 12,000.00 |
| DPT Mobilization/Demobilization | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| DPT Rig | 9 | day | $ 2,500.00 | $ 23,437.50 |
| Injection Trailer Mobilization/Demobilization | 1 | lump sum | $ 3,000.00 | $ 3,000.00 |
| Injection Trailer Rental | 2 | week | $ 1,750.00 | $ 3,500.00 |
| Potassium Permanganate (30 injections, 15 source area wells at 3,000 gal and 15 downgradient wells at 3,000 gal per point, includes transport) | 67,500 | gallon | $ 0.87 | $ 58,725.00 |
| Injection Equipment and Consumables | 1 | lump sum | $ 10,000.00 | $ 10,000.00 |
| **Ozone System Construction and SVE System Upgrade** | | | | |
| Air Knife | 1 | day | $ 2,000.00 | $ 2,000.00 |
| HSA Drill Rig Mob/Demob | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| South Installation of Ozone Sparge Wells (includes well heads) | 5 | each | $ 2,000.00 | $ 10,000.00 |
| South Stainless Steel Ozone Sparge Screens | 5 | each | $ 250.00 | $ 1,250.00 |
| South Ozone Sparge Piping and Trenching (includes labor) | 600 | linear foot | $ 42.00 | $ 25,200.00 |
| South Equipment Bldg. | 1 | each | $ 12,000.00 | $ 12,000.00 |
| South Concrete Slab (15' x 30' x 8") | 450 | square foot | $ 10.00 | $ 4,500.00 |
| South Ozone Sparge System | 1 | each | $ 90,000.00 | $ 90,000.00 |
| South Ambient Ozone Alarms | 6 | each | $ 1,250.00 | $ 7,500.00 |
| South SVE Liquid Bag Filter | 1 | each | $ 2,500.00 | $ 2,500.00 |
| South SVE Liquid GAC Unit | 1 | each | $ 4,000.00 | $ 4,000.00 |
| South System Telemetry | 1 | each | $ 2,500.00 | $ 2,500.00 |
| Treatment System Installation (crew of 3, 3 days) | 90 | hour | $ 85.00 | $ 7,650.00 |
| Electrical Drop | 1 | lump sum | $ 2,500.00 | $ 2,500.00 |
| Surveying | 1 | day | $ 2,000.00 | $ 2,000.00 |
| Permit to Discharge Treated SVE Liquid | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| **SUBTOTAL** | | | | **$ 391,337.50** |
| ***TOTAL DIRECT CAPITAL COSTS*** | | | | ***$ 391,337.50*** |
| ***INDIRECT CAPITAL COSTS*** | | | | |
| Engineering and Construction Oversight (25% Total Direct Costs) | 1 | lump sum | $ 97,834.38 | $ 97,834.38 |
| Injection Labor (7% Total Direct Costs) | 1 | lump sum | $ 27,393.63 | $ 27,393.63 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 11,740.13 | $ 11,740.13 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 39,133.75 | $ 39,133.75 |
| **TOTAL INDIRECT CAPITAL COSTS** | | | | **$ 176,100.00** |
| ***TOTAL CAPITAL COSTS (Direct and Indirect)*** | | | | ***$ 567,438*** |
| ***O & M COSTS*** | | | | |
| **System Operations Costs** | | | | |
| Electricity | 12 | monthly | $ 1,500.00 | $ 18,000.00 |
| Water Transport/Disposal | 2 | annual | $ 2,500.00 | $ 5,000.00 |
| System Maintenance Labor | 226 | hour | $ 105.00 | $ 23,730.00 |
| Field Equipment | 52 | visit | $ 500.00 | $ 26,000.00 |
| O&M Reporting for Air Permit | 4 | quarterly | $ 2,500.00 | $ 10,000.00 |
| **SUBTOTAL** | | | | **$ 82,730.00** |
| Maintenance/Repair Costs (10% Total Direct Costs) | 1 | lump sum | $ 8,273.00 | $ 8,273.00 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 2,481.90 | $ 2,481.90 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 8,273.00 | $ 8,273.00 |
| **SUBTOTAL** | | | | **$ 10,754.90** |
| **ANNUAL O&M COSTS** | | | | **$ 93,484.90** |
| *STARTUP AND MONITORING COSTS* | | | | |
| Startup and Sampling Labor (included under O&M) | | | | |
| Air Monitoring - VOCs | 69 | samples | $ 210.00 | $ 14,490.00 |
| Air Monitoring - Well Head System Optimization | 42 | samples | $ 210.00 | $ 8,820.00 |
| **Ground Water Monitoring Cost Per Event** | | | | |
| Well Sampling Labor and Equipment | 40 | wells | $ 425.00 | $ 17,000.00 |
| Ground Water Analysis - VOCs (20 wells + 30% QA/QC) | 52 | samples | $ 120.00 | $ 6,240.00 |
| Ground Water Analysis - Metals (20 wells + 30% QA/QC) | 52 | samples | $ 51.00 | $ 2,652.00 |
| Reporting | 1 | lump sum | $ 5,000.00 | $ 5,000.00 |
| **SUBTOTAL** | | | | **$ 30,892.00** |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 926.76 | $ 926.76 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 3,089.20 | $ 3,089.20 |
| **SUBTOTAL** | | | | **$ 4,015.96** |
| **Total Costs Per Event** | | | | **$ 34,907.96** |
| **Annual O&M Cost** | | | | **$ 93,484.90** |
| **Annual Monitoring Cost , Year 1** | | | | **$ 154,121.84** |
| **Annual Monitoring Cost, Year 2** | | | | **$ 148,451.84** |
| **Annual Monitoring Cost, Year 3** | | | | **$ 139,631.84** |
| **SUBTOTAL NET PRESENT WORTH O&M COSTS (2 years) (1)** | | | | **$ 169,022** |
| **JBTOTAL NET PRESENT WORTH MONITORING COSTS (3 years) (1)** | | | | **$ 388,055** |
| ***TOTAL CAPITAL, MONITORING, AND O&M COSTS*** | | | | ***$ 1,124,514.70*** |
| General Contingency (30% of Total Capital and O&M Costs) | | | | ***$ 337,354.41*** |
| ***TOTAL COST OF ALTERNATIVE (PRESENT WORTH)*** | | | | ***$ 1,462,000.00*** |

**Notes:**
**Feasibility costs only (includes 30% contingency). Do not use for design.**
An SVE skid package, select SVE wells, and vapor monitoring points are part of the current onsite remediation system south of 178th Street.
(1) Present worth calculated using equal series present worth analysis where i = 7 %

**Alternative 6 - IWAS**
**Feasibility Study**
**Normandy Park, Washington**

| DESCRIPTION | QUANTITY Number | Unit | COST Unit Cost | Total Cost |
|---|---|---|---|---|
| ***DIRECT CAPITAL COSTS*** | | | | |
| **Site Preparation** | | | | |
| Remedial Design/Workplan | 1 | each | $ 15,000.00 | $ 15,000.00 |
| Boring Permits (includes grout inspections) | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| Utility Clearance | 1 | lump sum | $ 750.00 | $ 750.00 |
| Clearing and Grubbing | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| **IWAS System Construction** | | | | |
| Pilot Study/Testing | 1 | lump sum | $ 50,000.00 | $ 50,000.00 |
| Drilling for IWAS wells (subcontractor) | 35 | each | $ 3,500.00 | $ 122,500.00 |
| Installation of IWAS wells (subcontractor) | 35 | each | $ 8,000.00 | $ 280,000.00 |
| Wellhead Boxes | 18 | each | $ 1,000.00 | $ 18,000.00 |
| Submersible Pumps | 35 | each | $ 1,981.00 | $ 69,335.00 |
| Mobilization (subcontractor - IWAS wells) | 1 | lump sum | $ 3,450.00 | $ 3,450.00 |
| Equipment Bldg. | 2 | each | $ 12,000.00 | $ 24,000.00 |
| Concrete Slab (15' x 30' x 8" per equipment bldg) | 900 | each | $ 10.00 | $ 9,000.00 |
| System Telemetry | 1 | each | $ 2,500.00 | $ 2,500.00 |
| Knockout Tank | 2 | each | $ 6,000.00 | $ 12,000.00 |
| Vapor GAC Unit | 4 | each | $ 3,000.00 | $ 12,000.00 |
| Extraction Blower, south system (250 scfm) | 1 | each | $ 8,000.00 | $ 8,000.00 |
| Extraction Blower, north system (150 scfm) | 1 | each | $ 5,000.00 | $ 5,000.00 |
| Filter (Vapor Treatment) | 2 | each | $ 3,000.00 | $ 6,000.00 |
| Compressor | 2 | each | $ 5,000.00 | $ 10,000.00 |
| Mob/Demob tractor loader/backhoe | 1 | lump sum | $ 2,000.00 | $ 2,000.00 |
| Cut existing asphalt (assume maximum 4 inches thick) | 4200 | linear foot | $ 2.30 | $ 9,660.00 |
| Haul asphalt offsite for disposal | 30 | cubic yard | $ 26.00 | $ 780.00 |
| Piping | 2100 | linear foot | $ 7.50 | $ 15,750.00 |
| Trenching | 2100 | linear foot | $ 5.00 | $ 10,500.00 |
| Valves, fittings, appurtenances | 1 | lump sum | $ 41,360.00 | $ 41,360.00 |
| Add'l. IWAS subcontractor expenses | 1 | lump sum | $ 6,680.00 | $ 6,680.00 |
| Mechanical Installation (crew of 3, 2 wks) | 300 | hour | $ 85.00 | $ 25,500.00 |
| Electrical Drop | 1 | lump sum | $ 2,000.00 | $ 2,000.00 |
| Surveying | 2 | day | $ 2,000.00 | $ 4,000.00 |
| **SUBTOTAL** | | | | **$ 750,015.00** |
| ***TOTAL DIRECT CAPITAL COSTS*** | | | | ***$ 750,015.00*** |
| ***INDIRECT CAPITAL COSTS*** | | | | |
| Engineering and Construction Oversight (25% Total Direct Costs) | 1 | lump sum | $ 187,503.75 | $ 187,503.75 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 22,500.45 | $ 22,500.45 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 75,001.50 | $ 75,001.50 |
| **TOTAL INDIRECT CAPITAL COSTS** | | | | **$ 285,000.00** |
| ***TOTAL CAPITAL COSTS (Direct and Indirect)*** | | | | ***$ 1,035,015*** |
| ***O & M COSTS*** | | | | |
| Electricity | 12 | monthly | $ 1,100.00 | $ 13,200.00 |
| Knock out water Transport/Disposal | 2 | lump sum | $ 2,500.00 | $ 5,000.00 |
| Field Equipment | 15 | visit | $ 450.00 | $ 6,750.00 |
| System Maintenance | 138 | hour | $ 80.00 | $ 11,040.00 |
| O&M Reporting for Air Permit | 4 | quarterly | $ 2,500.00 | $ 10,000.00 |
| **SUBTOTAL** | | | | **$ 45,990.00** |
| Maintenance/Repair Costs (10% Total Direct Costs) | 1 | lump sum | $ 2,299.50 | $ 2,299.50 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 1,379.70 | $ 1,379.70 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 4,599.00 | $ 4,599.00 |
| **SUBTOTAL** | | | | **$ 8,278.20** |
| **Annual Operation Costs** | | | | **$ 54,268.20** |
| *STARTUP AND MONITORING COSTS* | | | | |
| Startup and Sampling Labor (included under O&M) | | | | |
| Air Monitoring - VOCs 3 locations (before/between/after GAC) | 69 | samples | $ 210.00 | $ 14,490.00 |
| Air Monitoring - VOCs 3 locations (before/between/after GAC) | 36 | samples | $ 210.00 | $ 7,560.00 |
| **Ground Water Monitoring Cost Per Event** | | | | |
| Well Sampling Labor and Equipment | 20 | wells | $ 425.00 | $ 8,500.00 |
| Ground Water Analysis - VOCs (20 wells + 30% QA/QC) | 26 | samples | $ 80.00 | $ 2,080.00 |
| Reporting | 1 | lump sum | $ 5,000.00 | $ 5,000.00 |
| **SUBTOTAL** | | | | **$ 15,580.00** |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 467.40 | $ 467.40 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 1,558.00 | $ 1,558.00 |
| **SUBTOTAL** | | | | **$ 2,025.40** |
| **Total Costs Per Event** | | | | **$ 17,605.40** |
| **Annual O&M Cost** | | | | **$ 54,268.20** |
| **Annual Monitoring Cost , Year 1** | | | | **$ 84,911.60** |
| **Annual Monitoring Cost, Year 2** | | | | **$ 77,981.60** |
| **Annual Monitoring Cost, Year 3** | | | | **$ 70,421.60** |
| **SUBTOTAL NET PRESENT WORTH O&M COSTS (2 years) [(1)]** | | | | **$ 98,118** |
| **JBTOTAL NET PRESENT WORTH MONITORING COSTS (3 years) [(1)]** | | | | **$ 205,407** |
| ***TOTAL CAPITAL, MONITORING, AND O&M COSTS*** | | | | ***$ 1,338,540.04*** |
| General Contingency (30% of Total Capital and O&M Costs) | | | | ***$ 401,562.01*** |
| ***TOTAL COST OF ALTERNATIVE (PRESENT WORTH)*** | | | | ***$ 1,741,000.00*** |

**Notes:**
**Feasibility costs only (includes 30% contingency). Do not use for design.**
(1) Present worth calculated using equal series present worth analysis where i = 7 %

**Alternative 7 - Pump & Treat with SVE**
**Feasibility Study**
**Normandy Park, Washington**

| DESCRIPTION | QUANTITY Number | Unit | COST Unit Cost | Total Cost |
|---|---|---|---|---|
| ***DIRECT CAPITAL COSTS*** | | | | |
| **Site Preparation** | | | | |
| Remedial Design/Workplan | 1 | each | $ 15,000.00 | $ 15,000.00 |
| Boring Permits (includes grout inspections) | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| Utility Clearance | 1 | lump sum | $ 750.00 | $ 750.00 |
| Clearing and Grubbing | 1 | lump sum | $ 1,500.00 | $ 1,500.00 |
| **Pump & Treat System Construction** | | | | |
| Extraction Well Installation | 36 | each | $ 8,000.00 | $ 288,000.00 |
| Wellhead Boxes | 17 | each | $ 1,000.00 | $ 17,000.00 |
| Submersible Pumps (@1/3 HP) | 36 | each | $ 2,000.00 | $ 72,000.00 |
| Equipment Bldg. | 2 | each | $ 15,000.00 | $ 30,000.00 |
| Concrete Slab (20' x 40' x 8" per equipment bldg) | 1600 | square foot | $ 10.00 | $ 16,000.00 |
| System Telemetry | 1 | each | $ 2,500.00 | $ 2,500.00 |
| Filter (liquid phase) | 2 | each | $ 3,000.00 | $ 6,000.00 |
| GAC Unit (liquid phase) | 4 | each | $ 12,000.00 | $ 48,000.00 |
| Transfer Pump (liquid phase) | 2 | each | $ 3,000.00 | $ 6,000.00 |
| Piping | 2000 | linear foot | $ 7.50 | $ 15,000.00 |
| Trenching | 1700 | linear foot | $ 5.00 | $ 8,500.00 |
| Asphalt Cutting/Repair | 11 | cubic foot | $ 150.00 | $ 1,650.00 |
| Valves, fittings, appurtenances | 1 | lump sum | $ 8,000.00 | $ 8,000.00 |
| Mechanical Installation (2 ppl, 1.5 weeks, includes SVE) | 1 | lump sum | $ 15,000.00 | $ 15,000.00 |
| Electrical Drop | 1 | lump sum | $ 2,000.00 | $ 2,000.00 |
| Surveying (includes SVE) | 2 | day | $ 2,000.00 | $ 4,000.00 |
| Sewer Permit | 1 | lump sum | $ 5,000.00 | $ 5,000.00 |
| **SUBTOTAL** | | | | $ 544,650.00 |
| ***TOTAL DIRECT CAPITAL COSTS*** | | | | $ 544,650.00 |
| ***INDIRECT CAPITAL COSTS*** | | | | |
| Engineering and Construction Oversight (25% Total Direct Costs) | 1 | lump sum | $ 136,162.50 | $ 136,162.50 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 16,339.50 | $ 16,339.50 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 54,465.00 | $ 54,465.00 |
| *TOTAL INDIRECT CAPITAL COSTS* | | | | $ 207,000.00 |
| ***TOTAL CAPITAL COSTS (Direct and Indirect)*** | | | | $ 751,650 |
| ***O & M COSTS*** | | | | |
| **System Operations Costs** | | | | |
| Electricity | 12 | monthly | $ 2,303.94 | $ 27,647.30 |
| System Maintenance | 424 | hour | $ 80.00 | $ 33,920.00 |
| Equipment Replacement (5% of equipment capital costs) | 1 | annual | $ 8,725.00 | $ 8,725.00 |
| O&M Reporting for Air Permit | 4 | quarterly | $ 2,000.00 | $ 8,000.00 |
| Treated Groundwater Disposal (Sewer, assume 5 gpm/well, 36 wells) | 12 | monthly | $ 31,186.17 | $ 374,233.99 |
| **SUBTOTAL** | | | | $ 452,526.29 |
| Maintenance/Repair Costs (10% Total Direct Costs) | 1 | lump sum | $ 45,252.63 | $ 45,252.63 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 13,575.79 | $ 13,575.79 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 45,252.63 | $ 45,252.63 |
| **SUBTOTAL** | | | | $ 104,081.05 |
| **Annual Operation Costs** | | | | $ 556,607.34 |
| *STARTUP AND MONITORING COSTS* | | | | |
| Startup and Sampling Labor (included under O&M) | | | | |
| Water Monitoring - VOCs 3 locations (before/between/after GAC) | 69 | samples | $ 80.00 | $ 5,520.00 |
| Water Monitoring - VOCs 3 locations (before/between/after GAC) | 36 | samples | $ 80.00 | $ 2,880.00 |
| Air Monitoring - VOCs 3 locations (before/between/after GAC) | 69 | samples | $ 210.00 | $ 14,490.00 |
| Air Monitoring - VOCs 3 locations (before/between/after GAC) | 36 | samples | $ 210.00 | $ 7,560.00 |
| **Ground Water Monitoring Cost Per Event** | | | | |
| Well Sampling Labor and Equipment | 20 | wells | $ 425.00 | $ 8,500.00 |
| Ground Water Analysis - VOCs (20 wells + 30% QA/QC) | 26 | samples | $ 80.00 | $ 2,080.00 |
| Reporting | 1 | lump sum | $ 5,000.00 | $ 5,000.00 |
| **SUBTOTAL** | | | | $ 15,580.00 |
| Health and Safety Costs (3% Total Direct Costs) | 1 | lump sum | $ 467.40 | $ 467.40 |
| Project Management & Administration (10% Total Direct Costs) | 1 | lump sum | $ 1,558.00 | $ 1,558.00 |
| **SUBTOTAL** | | | | $ 2,025.40 |
| **Total Costs Per Event** | | | | $ 17,605.40 |
| **Annual O&M Cost** | | | | $ 556,607.34 |
| **Annual Monitoring Cost (Startup & monthly sampling), Year 1** | | | | $ 90,431.60 |
| **Annual Monitoring Cost (Monthly sampling), Year 2** | | | | $ 80,861.60 |
| **Annual Monitoring Cost (Monthly sampling), Year 3** | | | | $ 70,421.60 |
| **SUBTOTAL NET PRESENT WORTH O&M COSTS (2 years)** (1) | | | | $ 1,006,356 |
| **UBTOTAL NET PRESENT WORTH MONITORING COSTS (3 years)** (1) | | | | $ 213,254 |
| ***TOTAL CAPITAL, MONITORING, AND O&M COSTS*** | | | | $ 1,971,260.43 |
| General Contingency (30% of Total Capital and O&M Costs) | | | | $ 591,378.13 |
| ***TOTAL COST OF ALTERNATIVE (PRESENT WORTH)*** | | | | $ 2,563,000.00 |

**Notes:**
**Feasibility costs only (includes 30% contingency). Do not use for design.**
(1) Present worth calculated using equal series present worth analysis where i = 7 %

## Kelly Rankich

**From:** Matt Dahl
**Sent:** Monday, September 09, 2013 2:03 PM
**To:** Courtney Seim (cseim@riddellwilliams.com); Robert Dijulio (rdijulio@wpblaw.com)
**Cc:** 'Cliff Schmitt'; Mike Staton; Kelly Rankich
**Subject:** Draft O&M Status Report - Manhattan Village and Harris Properties
**Attachments:** O&M_Status_090913.pdf

Courtney and Bob –

We are sending this e-mail to serve as the O&M status report covering the last 6 months of SVE system operation. The status report includes the summary below and the PDF attachments. Let us know if submitting an O&M status report in this e-mail w/attachment format is ok, or if you prefer to receive a status report in a letter format.

**O&M Reporting Period: March through August 2013**

PES Environmental, Inc. conducted monthly site checks and quarterly operations and maintenance (O&M) visits of the Soil Vapor Extraction (SVE) system at the Manhattan Village Shopping Center/Harris Properties. The monthly site checks were to ensure proper system operation, drain condensate as needed, and record basic operating parameters. The quarterly O&M visits included field measurements for vacuum, flow rates, volatile organic compound (VOC) concentrations of the effluent stack using a photo-ionization detector (PID), collecting effluent stack samples for tetrachloroethene (PCE) laboratory analysis using USEPA Method TO-15, and draining the condensate as needed.

The SVE system was 100% operational, with the exception of brief shutdowns for maintenance and a 6.5-hour shut down during the air sparge pilot test on June 20, 2013. System flow rates ranged from 251 to 275 standard cubic feet per minute (scfm), based on calculations using the differential pressure gauge readings. The PCE concentrations in the system effluent in March and June were 93.4 and 83.4 parts per billion by volume (ppbv), respectively. PCE removal rates ranged from 0.013 to 0.016 pounds per day and approximately 2 pounds of PCE were removed during this reporting period. A total of approximately 92 pounds of PCE have been removed since the current SVE system operations began in September 2009. The total pounds removed by the SVE system was recalculated by PES due to errors in ERM's flow rate calculations.

The field measurements and PCE removal calculations are presented in the attached table and a chart showing the total pounds of PCE removed versus time is included on the attached figure. The laboratory analytical reports for the SVE effluent samples are attached.

The blower oil was changed on March 21, 2013 and the in-line air filter was replaced on June 27, 2013. The accumulated SVE system condensate was transported and disposed in June. A total of 700 gallons of hazardous condensate was disposed by NRC Environmental Services Inc. on June 20, 2013, and 350 gallons of non-hazardous condensate was disposed by Marine Vacuum on June 14, 2013. The waste disposal manifests are attached. The laboratory analytical report for a sample collected from the non-hazardous SVE condensate is also attached.

**O&M Activities to be conducted next period:**

PES is planning to conduct routine monthly site checks and quarterly O&M visits. Additional O&M activities will be conducted including sampling the individual SVE wells, balancing the SVE wells to optimize flow and mass removal, and temporarily shutting down SVE wells SVE-5 through SVE-10 to evaluate rebound conditions in groundwater monitoring wells. Note – SVE wells SVE-8 and SVE-9 are currently offline, and these wells will be temporarily restarted during the well field balancing and monitoring period.

**Comments**

We noted that the PCE mass removal rate has dropped since last year. This is likely due to some combination of declining PCE concentrations and needing to rebalance the SVE well field.

Please let us know if you have any questions.

Regards,

Matt Dahl, P.E.
PES Environmental , Inc.
*ph: (206) 529-3980 ext. 103*
*cell: (425) 922-0872*
*fax: (206) 529-3985*

**Attachments**

**SVE System Status**

**Reporting Period: March through August 2013**

- **Table 1 - SVE System Operation and Maintenance Data**
- **Figure 1 – Cumulative PCE Removed**
- **SVE Effluent Stack Sample Lab Data**
  - **March 11, 2013 – Fremont Analytical Report 1303053**
  - **June 14, 2013 – Fremont Analytical Report 1306114**
- **SVE Condensate Sample Lab Data**
  - **May 10, 2013 – Fremont Analytical Report 1305056**
- **SVE Condensate Disposal Manifests**
  - **NRC Environmental Services**
  - **Marine Vacuum Service, Inc.**

# Table 1
## SVE System Operation and Maintenance Data
## Manhattan Village/Harris Properties
## Normandy Park, Washington

| Date | Time | Period Run Time (days) | System Down Time (days) | Electrical Meter (KWH) | Operating Wells[5] | Diff. Press. (in. w.c.) | Header Vacuum (in. w.c.) | Blower Vacuum (in. w.c.) | Temp. (deg F) | Flow[1] (scfm) | VOC[2] (ppm) | Lab Data | | PCE Removal Rate[3] (lb/day) | Cumulative PCE Removed[4] (lbs) | Condensate | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | PCE (ppbv) | PCE ($\mu g/m^3$) | | | Transferred (gallons) | On-site (gallons) | |
| 3/8/12 | 1115 | - | - | - | 1, 3, 5, 6, 7, 10 | 4 | 16 | - | - | 270 | 0.2 | 200 | 1,400 | 0.03 | 72.5 | NA | NA | per ERM data tables, revised by PES |
| 7/12/12 | 830 | 126 | 0 [6] | - | 1, 3, 5, 6, 7, 10 | 4 | 14.5 | - | - | 270 | 0.5 | 260 | 1,800 | 0.044 | 77.1 | NA | NA | data collected by ERM |
| 11/15/12 | 1100 | 126 | 0 [6] | - | 1, 3, 5, 6, 7, 10 | 4.1 | 15 | - | - | 273 | 0.4 | 460 | 3,100 | 0.076 | 84.7 | NA | 690 | data collected by ERM; estimate of condensate |
| 2/8/13 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 150 | 840 | site visit to drain condensate |
| 3/11/13 | 900 | 116 | 0 [6] | 15387 | 1, 2, 3, 5, 6, 7, 10 | 4.2 | 17 | 30 | - | 275 | 0.171 | 93.4 | 633 | 0.016 | 90.0 | 90 | 930 | O&M |
| 3/21/13 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 | 930 | Oil Change; synthetic VG-220 |
| 4/10/13 | 815 | 30 | 0 [6] | 15708 | 1, 2, 3, 5, 6, 7, 10 | 4.2 | - | 30 | 54.2 | 275 | 0.171 | - | - | - | - | 80 | 1,010 | site check |
| 5/10/13 | 730 | 30 | 0 [6] | 16029 | 1, 2, 3, 5, 6, 7, 10 | 4.2 | - | 30 | - | 275 | - | - | - | - | - | 40 | 1,050 | site check; condensate sample |
| 6/14/13 | 800 | 35 | 0 [6] | 16430 | 1, 2, 3, 4, 5, 6, 7, 10 | 4.2 | 17 | 50 | 57.0 | 275 | 0.114 | 83.4 | 566 | 0.014 | 91.4 | 0 | 0 | O&M; condensate disposal |
| 6/20/13 | - | 6 | 0 [6] | - | 1, 2, 3, 4, 5, 6, 7, 10 | - | - | - | - | - | - | - | - | - | - | 0 | 0 | AS Pilot Test; SVE shut down during test; condensate disposal |
| 6/27/13 | - | 7 | 0 [6] | - | 1, 2, 3, 4, 5, 6, 7, 10 | - | - | 42 | - | - | - | - | - | - | - | 0 | 0 | changed in-line filter |
| 7/11/13 | 1500 | 14 | 0 [6] | 16742 | 1, 2, 3, 4, 5, 6, 7, 10 | 4.0 | - | 42 | - | 268 | - | - | - | 0.014 | 91.8 | 0 | 0 | site check |
| 8/6/13 | 700 | 26 | 0 [6] | 17040 | 1, 2, 3, 4, 5, 6, 7, 10 | 3.5 | - | 42 | - | 251 | - | - | - | 0.013 | 92.1 | 0 | 0 | site check |

**Notes:**

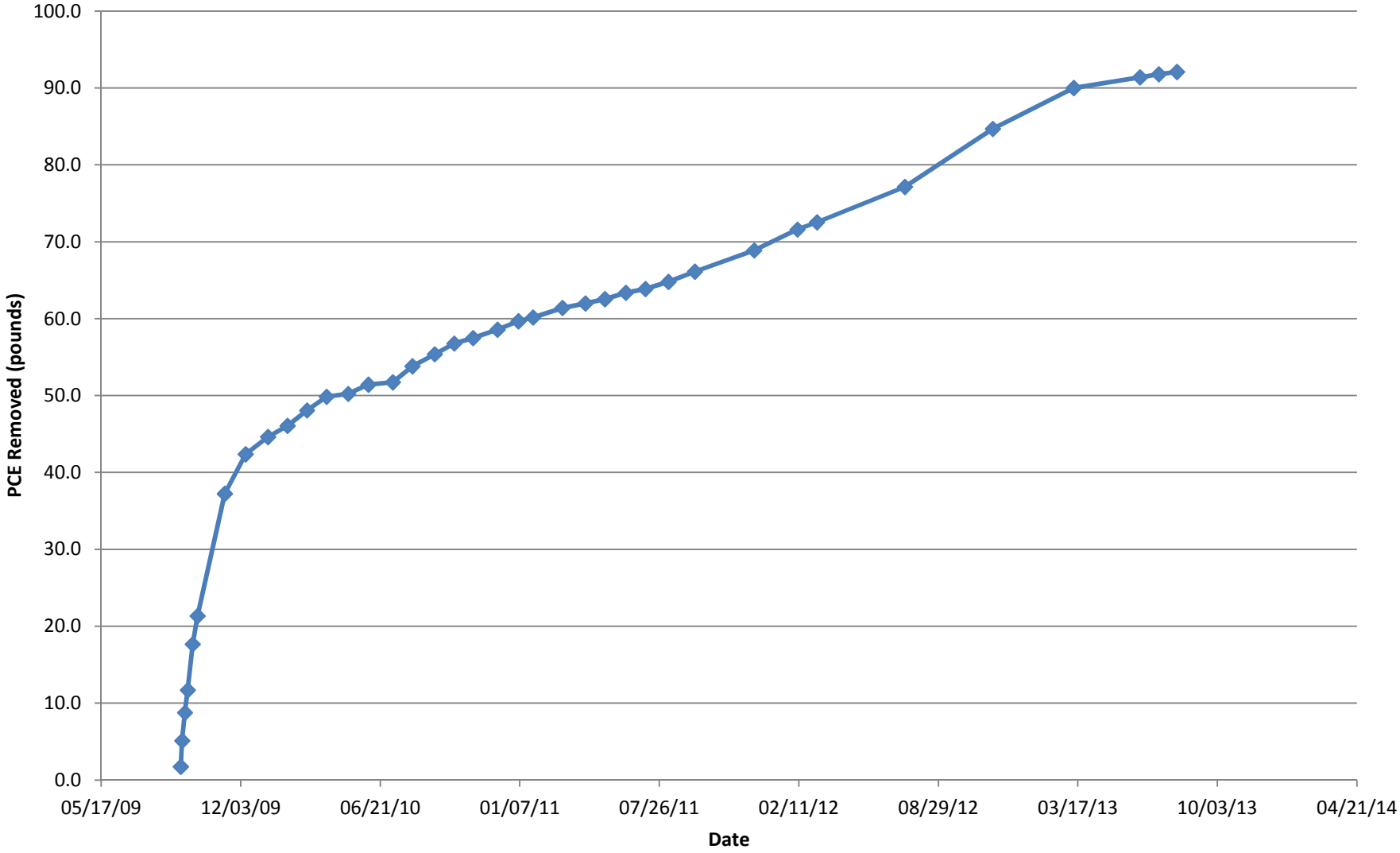
1. Calculated flow rate based on differential pressure (diff. press.) and normalized to standard conditions
2. As measured with a photoionization detector (PID) adjusted using 0.57 correction factor for PCE
3. Mass Removal Rate = [flow (scfm) * PCE ($\mu g/m^{3)}$ * 28.3168 (L/cf) / 1,000 ($L/m^3$) / 453,592,370 ($\mu g$/lb) * 60 (min/hour) * 24 (hour/day)]
4. Cumulative mass removed = average mass removal rates from previous and current O&M visit * period run time
5. The numbers refer to the SVE well number
6. Blower operating hours meter is not working, blower assumed to have run continuously

KWH = Kilowatt Hours
in. w.c. = inches of water column
scfm = standard cubic feet per minute
deg F = degrees Fahrenheit

NM = not measured
PCE = tetrachloroethene
ppm = parts per million
ppbv = parts per billion by volume

VOC = Volatile Organic Compounds
$\mu g/m^3$ = micrograms per cubic meter
lb/day = pounds per day
NA = not available
Temp. = Temperature

# Figure 1
# Cumulative PCE Removed
# Manhattan Village/Harris Properties




\\ad.pesenv.com\dfs\Bellevue\Draft\1358-Harris_Mahattan_Tenants_in_Common\Excel\O\O&M table_2013  Chart1

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**PES Environmental, Inc.**
Matt Dahl
1215 Fourth Avenue, Suite 1350
Seattle, Washington 98161

**RE: Manhattan Village**
**Lab ID: 1303053**

March 20, 2013

**Attention Matt Dahl:**

Fremont Analytical, Inc. received 1 sample(s) on 3/11/2013 for the analyses presented in the following report.

***Volatile Organic Compounds by EPA Method TO-15***

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Michael Dee
Sr. Chemist / Principal

**Date:** *03/20/2013*

**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village
**Lab Order:** 1303053

# Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Date/Time Collected | Date/Time Received |
|---|---|---|---|
| 1303053-001 | SVE-EFF-031113 | 03/11/2013 9:50 AM | 03/11/2013 3:37 PM |

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

# Case Narrative

WO#: **1303053**
Date: **3/20/2013**

**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

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

II. GENERAL REPORTING COMMENTS:
Air samples are reported in ppbv and ug/m3.

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

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

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1303053
**Project:** Manhattan Village

**Client Sample ID:** SVE-EFF-031113
**Lab ID:** 1303053-001A
**Sample Type:** Summa Canister

**Date Sampled:** 3/11/2013
**Date Received:** 3/11/2013

| Analyte | Concentration (ppbv) | Concentration (ug/m³) | Reporting Limit (ppbv) | Qual | Test Method | Date Analyzed /Analyst | |
|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | |
| Tetrachloroethene (PCE) | 93.4 | 633 | 0.300 | | TO-15 | 03/19/2013 | MD |
| Surr: 4-Bromofluorobenzene | 91.5 %Rec | -- | 70-130 | | TO-15 | 03/19/2013 | MD |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

Fremont Analytical

**Date:** *3/20/2013*

**Work Order:** 1303053
**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method TO-15

| Sample ID: **LCS-R7814** | SampType: **LCS** | | | Units: **ppbv** | | Prep Date: **3/19/2013** | | RunNo: **7814** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **LCSW** | Batch ID: **R7814** | | | | | Analysis Date: **3/19/2013** | | SeqNo: **154805** | | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Tetrachloroethene (PCE) | 5.15 | 0.300 | 5.000 | 0 | 103 | 70 | 130 | | | | |
| Surr: 4-Bromofluorobenzene | 9.87 | | 10.00 | | 98.7 | 70 | 130 | | | | |

| Sample ID: **MB-R7814** | SampType: **MBLK** | | | Units: **ppbv** | | Prep Date: **3/19/2013** | | RunNo: **7814** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **MBLKW** | Batch ID: **R7814** | | | | | Analysis Date: **3/19/2013** | | SeqNo: **154806** | | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Tetrachloroethene (PCE) | ND | 0.300 | | | | | | | | | |
| Surr: 4-Bromofluorobenzene | 9.29 | | 10.00 | | 92.9 | 70 | 130 | | | | |

| Sample ID: **1303053-001AREP** | SampType: **REP** | | | Units: **ppbv** | | Prep Date: **3/20/2013** | | RunNo: **7814** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **SVE-EFF-031113** | Batch ID: **R7814** | | | | | Analysis Date: **3/20/2013** | | SeqNo: **154808** | | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Tetrachloroethene (PCE) | 91.5 | 0.300 | | | | | | 93.38 | 2.06 | 30 | |
| Surr: 4-Bromofluorobenzene | 19.5 | | 20.00 | | 97.3 | 70 | 130 | | 0 | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

# Sample Log-In Check List

| | |
|---|---|
| Client Name: **PES** | Work Order Number: **1303053** |
| Logged by: **Clare Griggs** | Date Received: **3/11/2013 3:37:00 PM** |

## Chain of Custody

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Were custodial seals present? | Yes | ☐ | No | ☐ | Not Required | ☑ |
| 2. | Is Chain of Custody complete? | Yes | ☑ | No | ☐ | Not Present | ☐ |
| 3. | How was the sample delivered? | | | | | | |

## Log In

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4. | Coolers are present? | Yes | ☐ | No | ☑ | NA | ☐ |
| | **Air Samples** | | | | | | |
| 5. | Was an attempt made to cool the samples? | Yes | ☐ | No | ☐ | NA | ☑ |
| 6. | Were all coolers received at a temperature of >0° C to 10.0°C | Yes | ☐ | No | ☐ | NA | ☑ |
| 7. | Sample(s) in proper container(s)? | Yes | ☑ | No | ☐ | | |
| 8. | Sufficient sample volume for indicated test(s)? | Yes | ☑ | No | ☐ | | |
| 9. | Are samples properly preserved? | Yes | ☑ | No | ☐ | | |
| 10. | Was preservative added to bottles? | Yes | ☐ | No | ☑ | NA | ☐ |
| 11. | Is there headspace present in VOA vials? | Yes | ☐ | No | ☐ | NA | ☑ |
| 12. | Did all sample containers arrive in good condition?(unbroken) | Yes | ☑ | No | ☐ | | |
| 13. | Does paperwork match bottle labels? | Yes | ☑ | No | ☐ | | |
| 14. | Are matrices correctly identified on Chain of Custody? | Yes | ☑ | No | ☐ | | |
| 15. | Is it clear what analyses were requested? | Yes | ☑ | No | ☐ | | |
| 16. | Were all holding times able to be met? | Yes | ☑ | No | ☐ | | |

## Special Handling (if applicable)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17. | Was client notified of all discrepancies with this order? | Yes | ☐ | No | ☐ | NA | ☑ |

| | | | |
|---|---|---|---|
| Person Notified: | | Date: | |
| By Whom: | | Via: | ☐ eMail ☐ Phone ☐ Fax ☐ In Person |
| Regarding: | | | |
| Client Instructions: | | | |

18. Additional remarks/Disrepancies

**Item Information**

# Fremont Analytical

# Air Chain of Custody Record

3600 Fremont Ave N
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (Internal): 1303053

Date: 3-11-13

Page: 1 of: 1

Client: PES
Address: 1215 4th Avenue Suite 1350
City, State, Zip: Seattle, WA 98161
Tel: 206-529-3980
Reports To (PM): Matt Dahl
Email: MDahl@pesenv.com

Project Name: Manhattan Village
Location: Normandy Park, WA
Collected by: Karsten Springstead
Project No: 1358.001.01.007

| | Sample Name | Canister Serial # | Sample Date | Sample Time | Indoor/ Outdoor | Sample Volume | Container Type | Lab Cert. Vacuum Pressure | Field Initial Sample Pressure | Field Final Sample Pressure | Analysis Requested | Internal: Receipt Date | Internal: Final (psi) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SVE-EFF-031113 | 12664 | 3-11-13 | 950 | Outdoor | 6L | Summa | -29" Hg | -29"Hg | -3"Hg | TO-15 for PCE only | 3/11/13 | -3 |
| 2 | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

Condition:
Seals Intact: Y N N/A

Special Remarks:
TO-15 for PCE only
EDP in ELM Format; Report to MRLs

| Relinquished | Date/Time | Received | Date/Time |
|---|---|---|---|
| x | 3-11-13 / | x | 3/11/13 15:37 |
| Relinquished | Date/Time | Received | Date/Time |
| x | | x | |

TAT --> (STD) Rush (specify)

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

**PES Environmental, Inc.**
Matt Dahl
1215 Fourth Avenue, Suite 1350
Seattle, Washington 98161

**RE: MSVC**
**Lab ID: 1306114**

June 24, 2013

**Attention Matt Dahl:**

Fremont Analytical, Inc. received 1 sample(s) on 6/14/2013 for the analyses presented in the following report.

***Volatile Organic Compounds by EPA Method TO-15***

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Michael Dee
Sr. Chemist / Principal

**Date:** *06/24/2013*

**CLIENT:** PES Environmental, Inc.
**Project:** MSVC
**Lab Order:** 1306114

# Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Date/Time Collected | Date/Time Received |
|---|---|---|---|
| 1306114-001 | SVE-EFF-061413 | 06/14/2013 9:30 AM | 06/14/2013 3:00 PM |

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

# Case Narrative

WO#: **1306114**
Date: **6/24/2013**

**CLIENT:** PES Environmental, Inc.
**Project:** MSVC

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

II. GENERAL REPORTING COMMENTS:
Air samples are reported in ppbv and ug/m3.

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

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

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1306114
**Project:** MSVC

**Client Sample ID:** SVE-EFF-061413
**Lab ID:** 1306114-001A
**Sample Type:** Summa Canister

**Date Sampled:** 6/14/2013
**Date Received:** 6/14/2013

| Analyte | Concentration (ppbv) | Concentration (ug/m³) | Reporting Limit (ppbv) | Qual | Test Method | Date Analyzed /Analyst | |
|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | |
| Tetrachloroethene (PCE) | 83.4 | 566 | 0.300 | | TO-15 | 06/17/2013 | SG |
| Surr: 4-Bromofluorobenzene | 90.6 %Rec | -- | 70-130 | | TO-15 | 06/17/2013 | SG |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

Fremont Analytical

**Date:** *6/24/2013*

**Work Order:** 1306114
**CLIENT:** PES Environmental, Inc.
**Project:** MSVC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method TO-15

| Sample ID: **1306080-001AREP** | SampType: **REP** | | | Units: **ppbv** | | Prep Date: **6/17/2013** | | RunNo: **8938** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **BATCH** | Batch ID: **R8938** | | | | | Analysis Date: **6/17/2013** | | SeqNo: **179685** | | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Tetrachloroethene (PCE) | ND | 0.300 | | | | | | 0 | 0 | 30 | |
| Surr: 4-Bromofluorobenzene | 88.4 | | 80.00 | | 110 | 70 | 130 | | 0 | | |

| Sample ID: **LCS-R8938** | SampType: **LCS** | | | Units: **ppbv** | | Prep Date: **6/19/2013** | | RunNo: **8938** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **LCSW** | Batch ID: **R8938** | | | | | Analysis Date: **6/19/2013** | | SeqNo: **179686** | | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Tetrachloroethene (PCE) | 4.31 | 0.300 | 5.000 | 0 | 86.2 | 70 | 130 | | | | |
| Surr: 4-Bromofluorobenzene | 9.51 | | 10.00 | | 95.1 | 70 | 130 | | | | |

| Sample ID: **MB-R8938** | SampType: **MBLK** | | | Units: **ppbv** | | Prep Date: **6/17/2013** | | RunNo: **8938** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **MBLKW** | Batch ID: **R8938** | | | | | Analysis Date: **6/17/2013** | | SeqNo: **179687** | | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Tetrachloroethene (PCE) | ND | 0.300 | | | | | | | | | |
| Surr: 4-Bromofluorobenzene | 9.42 | | 10.00 | | 94.2 | 70 | 130 | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

# Sample Log-In Check List

| | |
|---|---|
| Client Name: **PES** | Work Order Number: **1306114** |
| Logged by: **Clare Griggs** | Date Received: **6/14/2013 3:00:00 PM** |

## *Chain of Custody*

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | Were custodial seals present? | Yes | ☐ | No | ☐ | Not Required ☑ |
| 2. | Is Chain of Custody complete? | Yes | ☑ | No | ☐ | Not Present ☐ |
| 3. | How was the sample delivered? | Client | | | | |

## *Log In*

| | | | | | | |
|---|---|---|---|---|---|---|
| 4. | Coolers are present? | Yes | ☐ | No | ☑ | NA ☐ |
| | | **Air Samples** | | | | |
| 5. | Was an attempt made to cool the samples? | Yes | ☐ | No | ☐ | NA ☑ |
| 6. | Were all coolers received at a temperature of >0° C to 10.0°C | Yes | ☐ | No | ☐ | NA ☑ |
| 7. | Sample(s) in proper container(s)? | Yes | ☑ | No | ☐ | |
| 8. | Sufficient sample volume for indicated test(s)? | Yes | ☑ | No | ☐ | |
| 9. | Are samples properly preserved? | Yes | ☑ | No | ☐ | |
| 10. | Was preservative added to bottles? | Yes | ☐ | No | ☑ | NA ☐ |
| 11. | Is there headspace present in VOA vials? | Yes | ☐ | No | ☐ | NA ☑ |
| 12. | Did all sample containers arrive in good condition?(unbroken) | Yes | ☑ | No | ☐ | |
| 13. | Does paperwork match bottle labels? | Yes | ☑ | No | ☐ | |
| 14. | Are matrices correctly identified on Chain of Custody? | Yes | ☑ | No | ☐ | |
| 15. | Is it clear what analyses were requested? | Yes | ☑ | No | ☐ | |
| 16. | Were all holding times able to be met? | Yes | ☑ | No | ☐ | |

## *Special Handling (if applicable)*

| | | | | | | |
|---|---|---|---|---|---|---|
| 17. | Was client notified of all discrepancies with this order? | Yes | ☐ | No | ☐ | NA ☑ |

| | | | |
|---|---|---|---|
| Person Notified: | | Date: | |
| By Whom: | | Via: | ☐ eMail ☐ Phone ☐ Fax ☐ In Person |
| Regarding: | | | |
| Client Instructions: | | | |

18. Additional remarks/Disrepancies

**Item Information**

# Fremont Analytical

# Air Chain of Custody Record

3600 Fremont Ave N
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: 6-14-13

Laboratory Project No (Internal): 1306114

Page: 1 of: 1

Client: PES

Address: 1215 4th Avenue Suite 1350

City, State, Zip: Seattle, WA 98161

Tel: 206-529-3980

Reports To (PM): Matt Dahl

Email: MDahl@pesenv.com

Project Name: MSUC

Location: Normandy Park, WA

Collected by: Karsten Springstead

Project No:

| | Sample Name | Canister Serial # | Sample Date | Sample Time | Indoor/ Outdoor | Sample Volume | Container Type | Lab Cert. Vacuum Pressure | Field Initial Sample Pressure | Field Final Sample Pressure | Analysis Requested | Internal: Receipt Date | Internal: Final (psi) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SVE-EFF-061413 | 13970 | 6-14-13 | 930 | OUTDOOR | 6L | Summa | -29" Hg | -29" | -5" | TO-15 | 6/14 | -5 |
| 2 | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

Condition:

Seals Intact: Y N N/A

Relinquished: x [signature] Date/Time: 6-14-13/1500

Received: x [signature] Date/Time: 6/14/13 1500

Relinquished: x

Date/Time

Received: x

Date/Time

Special Remarks: Report to MRLS
EDD in EIM Format

TAT --> (STD) Rush (specify)

## Michael C. Ridgeway

**From:** Kelly Rankich [KRankich@pesenv.com]
**Sent:** Monday, June 17, 2013 8:39 AM
**To:** Michael C. Ridgeway
**Cc:** Karsten Springstead; Matt Dahl
**Subject:** FW: We have received a new Work Order at Fremont Analytical, Inc. for PES Environmental, Inc..

This TO-15 sample is to be run for PCE only. Mike, do you want me to revise the COC?

Kelly

-----Original Message-----
From: service@fremontanalytical.com [mailto:service@fremontanalytical.com]
Sent: Friday, June 14, 2013 3:41 PM
To: Kelly Rankich
Subject: We have received a new Work Order at Fremont Analytical, Inc. for PES Environmental, Inc..

Here are the work order details:

Work Order Number: 1306114
Project Name: MSVC
Invoice to: PES Environmental, Inc.
Client Contact: Matt Dahl
Date Received: 6/14/2013 3:00:00 PM
Priority: Routine
Due Date: 6/21/2013 12:00:00 AM
No. of Samples: 1

You can check the status of this work order and download the reports at
http://Client.fremontanalytical.com/Flashpoint/Secure/WorkOrderDetails.aspx?WorkOrder=1306114

This alert was sent according to your preferences. To update your settings, go to
http://Client.fremontanalytical.com/Flashpoint/Secure/EmailAlerts.aspx

Thank You for using Fremont Analytical, Inc.

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

**PES Environmental, Inc.**
Matt Dahl
1215 Fourth Avenue, Suite 1350
Seattle, Washington 98161

**RE: Manhattan Village**
**Lab ID: 1305056**

May 16, 2013

**Attention Matt Dahl:**

Fremont Analytical, Inc. received 1 sample(s) on 5/10/2013 for the analyses presented in the following report.

***Volatile Organic Compounds by EPA Method 8260***

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Michael Dee
Sr. Chemist / Principal

**Date:** *05/16/2013*

**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village
**Lab Order:** 1305056

# Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Date/Time Collected | Date/Time Received |
|---|---|---|---|
| 1305056-001 | COND-1-051013 | 05/10/2013 9:30 AM | 05/10/2013 12:15 PM |

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

# Case Narrative

WO#: **1305056**
Date: **5/16/2013**

**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

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

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

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

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

# Analytical Report

WO#: **1305056**
Date Reported: **5/16/2013**

**Client:** PES Environmental, Inc.
**Collection Date:** 5/10/2013 9:30:00 AM
**Project:** Manhattan Village
**Lab ID:** 1305056-001
**Matrix:** Water
**Client Sample ID: COND-1-051013**

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method 8260** | | | | Batch ID: R8518 | | Analyst: EM |
| Dichlorodifluoromethane (CFC-12) | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Chloromethane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Vinyl chloride | ND | 0.200 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Bromomethane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Trichlorofluoromethane (CFC-11) | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Chloroethane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,1-Dichloroethene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Methylene chloride | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| trans-1,2-Dichloroethene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Methyl tert-butyl ether (MTBE) | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,1-Dichloroethane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 2,2-Dichloropropane | ND | 2.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| cis-1,2-Dichloroethene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Chloroform | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,1,1-Trichloroethane (TCA) | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,1-Dichloropropene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Carbon tetrachloride | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,2-Dichloroethane (EDC) | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Benzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Trichloroethene (TCE) | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,2-Dichloropropane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Bromodichloromethane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Dibromomethane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| cis-1,3-Dichloropropene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Toluene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| trans-1,3-Dichloropropene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,1,2-Trichloroethane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,3-Dichloropropane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Tetrachloroethene (PCE) | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Dibromochloromethane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,2-Dibromoethane (EDB) | ND | 0.0100 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Chlorobenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,1,1,2-Tetrachloroethane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Ethylbenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| m,p-Xylene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

# Analytical Report

WO#: **1305056**
Date Reported: **5/16/2013**

**Client:** PES Environmental, Inc.
**Collection Date:** 5/10/2013 9:30:00 AM
**Project:** Manhattan Village
**Lab ID:** 1305056-001
**Matrix:** Water
**Client Sample ID: COND-1-051013**

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method 8260** | | | | Batch ID: R8518 | | Analyst: EM |
| o-Xylene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Styrene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Isopropylbenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Bromoform | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,1,2,2-Tetrachloroethane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| n-Propylbenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Bromobenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,3,5-Trimethylbenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 2-Chlorotoluene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 4-Chlorotoluene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| tert-Butylbenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,2,3-Trichloropropane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,2,4-Trichlorobenzene | ND | 2.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| sec-Butylbenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 4-Isopropyltoluene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,3-Dichlorobenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,4-Dichlorobenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| n-Butylbenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,2-Dichlorobenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,2-Dibromo-3-chloropropane | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,2,4-Trimethylbenzene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Hexachlorobutadiene | ND | 4.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Naphthalene | ND | 1.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| 1,2,3-Trichlorobenzene | ND | 4.00 | | µg/L | 1 | 5/14/2013 3:43:00 AM |
| Surr: Dibromofluoromethane | 92.0 | 72.1-122 | | %REC | 1 | 5/14/2013 3:43:00 AM |
| Surr: Toluene-d8 | 95.2 | 62.1-129 | | %REC | 1 | 5/14/2013 3:43:00 AM |
| Surr: 1-Bromo-4-fluorobenzene | 98.1 | 66.8-124 | | %REC | 1 | 5/14/2013 3:43:00 AM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1305056
**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **1305050-001AMS** SampType: **MS** Units: **µg/L** Prep Date: **5/14/2013** RunNo: **8518**
Client ID: **BATCH** Batch ID: **R8518** Analysis Date: **5/14/2013** SeqNo: **169789**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane (CFC-12) | 17.3 | 1.00 | 20.00 | 0 | 86.7 | 33.3 | 122 | | | | |
| Chloromethane | 21.7 | 1.00 | 20.00 | 0 | 108 | 48.2 | 145 | | | | |
| Vinyl chloride | 22.8 | 0.200 | 20.00 | 0 | 114 | 45.6 | 149 | | | | |
| Bromomethane | 23.3 | 1.00 | 20.00 | 0 | 116 | 31.5 | 135 | | | | |
| Trichlorofluoromethane (CFC-11) | 23.8 | 1.00 | 20.00 | 0 | 119 | 54.7 | 138 | | | | |
| Chloroethane | 22.0 | 1.00 | 20.00 | 0 | 110 | 52.7 | 140 | | | | |
| 1,1-Dichloroethene | 23.2 | 1.00 | 20.00 | 0 | 116 | 58.2 | 146 | | | | |
| Methylene chloride | 22.3 | 1.00 | 20.00 | 0 | 111 | 65.1 | 127 | | | | |
| trans-1,2-Dichloroethene | 23.7 | 1.00 | 20.00 | 0 | 119 | 69 | 132 | | | | |
| Methyl tert-butyl ether (MTBE) | 22.7 | 1.00 | 20.00 | 0 | 114 | 70 | 130 | | | | |
| 1,1-Dichloroethane | 22.2 | 1.00 | 20.00 | 0 | 111 | 74.7 | 133 | | | | |
| 2,2-Dichloropropane | 19.5 | 2.00 | 20.00 | 0 | 97.4 | 31.5 | 121 | | | | |
| cis-1,2-Dichloroethene | 22.4 | 1.00 | 20.00 | 0 | 112 | 67.1 | 123 | | | | |
| Chloroform | 24.3 | 1.00 | 20.00 | 0 | 122 | 58.6 | 123 | | | | |
| 1,1,1-Trichloroethane (TCA) | 25.0 | 1.00 | 20.00 | 0 | 125 | 64.2 | 146 | | | | |
| 1,1-Dichloropropene | 23.4 | 1.00 | 20.00 | 0 | 117 | 73.8 | 136 | | | | |
| Carbon tetrachloride | 24.4 | 1.00 | 20.00 | 0 | 122 | 69.2 | 141 | | | | |
| 1,2-Dichloroethane (EDC) | 23.6 | 1.00 | 20.00 | 0 | 118 | 62.3 | 130 | | | | |
| Benzene | 24.4 | 1.00 | 20.00 | 0 | 122 | 68.7 | 132 | | | | |
| Trichloroethene (TCE) | 22.7 | 1.00 | 20.00 | 0 | 114 | 65.7 | 133 | | | | |
| 1,2-Dichloropropane | 22.0 | 1.00 | 20.00 | 0 | 110 | 70 | 130 | | | | |
| Bromodichloromethane | 24.1 | 1.00 | 20.00 | 0 | 121 | 59.4 | 139 | | | | |
| Dibromomethane | 23.2 | 1.00 | 20.00 | 0 | 116 | 65.5 | 130 | | | | |
| cis-1,3-Dichloropropene | 20.4 | 1.00 | 20.00 | 0 | 102 | 63.3 | 124 | | | | |
| Toluene | 24.0 | 1.00 | 20.00 | 0 | 120 | 68.4 | 133 | | | | |
| trans-1,3-Dichloropropene | 22.8 | 1.00 | 20.00 | 0 | 114 | 57.7 | 125 | | | | |
| 1,1,2-Trichloroethane | 23.5 | 1.00 | 20.00 | 0 | 117 | 59.4 | 127 | | | | |
| 1,3-Dichloropropane | 20.8 | 1.00 | 20.00 | 0 | 104 | 68.2 | 134 | | | | |
| Tetrachloroethene (PCE) | 17.5 | 1.00 | 20.00 | 0 | 87.5 | 51.5 | 109 | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1305056
**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **1305050-001AMS** SampType: **MS** Units: **µg/L** Prep Date: **5/14/2013** RunNo: **8518**
Client ID: **BATCH** Batch ID: **R8518** Analysis Date: **5/14/2013** SeqNo: **169789**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dibromochloromethane | 23.1 | 1.00 | 20.00 | 0 | 116 | 66.2 | 138 | | | | |
| 1,2-Dibromoethane (EDB) | 20.8 | 0.0100 | 20.00 | 0 | 104 | 68.9 | 124 | | | | |
| Chlorobenzene | 19.9 | 1.00 | 20.00 | 0 | 99.4 | 68.9 | 128 | | | | |
| 1,1,1,2-Tetrachloroethane | 21.4 | 1.00 | 20.00 | 0 | 107 | 67.3 | 135 | | | | |
| Ethylbenzene | 19.6 | 1.00 | 20.00 | 0 | 98.2 | 67.3 | 135 | | | | |
| m,p-Xylene | 39.4 | 1.00 | 40.00 | 0 | 98.6 | 63.3 | 135 | | | | |
| o-Xylene | 23.8 | 1.00 | 20.00 | 0 | 119 | 67.8 | 131 | | | | |
| Styrene | 26.1 | 1.00 | 20.00 | 0 | 131 | 67.2 | 123 | | | | S |
| Isopropylbenzene | 20.1 | 1.00 | 20.00 | 0 | 101 | 56 | 147 | | | | |
| Bromoform | 20.5 | 1.00 | 20.00 | 0 | 102 | 61.4 | 136 | | | | |
| 1,1,2,2-Tetrachloroethane | 19.1 | 1.00 | 20.00 | 0 | 95.4 | 59.1 | 137 | | | | |
| n-Propylbenzene | 18.7 | 1.00 | 20.00 | 0 | 93.6 | 57.6 | 142 | | | | |
| Bromobenzene | 20.6 | 1.00 | 20.00 | 0 | 103 | 63.6 | 130 | | | | |
| 1,3,5-Trimethylbenzene | 20.4 | 1.00 | 20.00 | 0 | 102 | 59.9 | 136 | | | | |
| 2-Chlorotoluene | 18.6 | 1.00 | 20.00 | 0 | 93.2 | 63.4 | 134 | | | | |
| 4-Chlorotoluene | 18.8 | 1.00 | 20.00 | 0 | 93.8 | 58.4 | 134 | | | | |
| tert-Butylbenzene | 22.0 | 1.00 | 20.00 | 0 | 110 | 74.2 | 141 | | | | |
| 1,2,3-Trichloropropane | 19.1 | 1.00 | 20.00 | 0 | 95.4 | 62.4 | 129 | | | | |
| 1,2,4-Trichlorobenzene | 19.5 | 2.00 | 20.00 | 0 | 97.7 | 53.7 | 120 | | | | |
| sec-Butylbenzene | 18.6 | 1.00 | 20.00 | 0 | 92.8 | 56 | 146 | | | | |
| 4-Isopropyltoluene | 17.2 | 1.00 | 20.00 | 0 | 86.0 | 62.4 | 134 | | | | |
| 1,3-Dichlorobenzene | 21.6 | 1.00 | 20.00 | 0 | 108 | 58.2 | 128 | | | | |
| 1,4-Dichlorobenzene | 20.3 | 1.00 | 20.00 | 0 | 102 | 60.1 | 123 | | | | |
| n-Butylbenzene | 19.6 | 1.00 | 20.00 | 0 | 97.9 | 54.6 | 135 | | | | |
| 1,2-Dichlorobenzene | 21.4 | 1.00 | 20.00 | 0 | 107 | 62.6 | 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 22.8 | 1.00 | 20.00 | 0 | 114 | 51.8 | 142 | | | | |
| 1,2,4-Trimethylbenzene | 18.8 | 1.00 | 20.00 | 0 | 94.1 | 63.7 | 132 | | | | |
| Hexachlorobutadiene | 18.6 | 4.00 | 20.00 | 0 | 92.8 | 62.1 | 121 | | | | |
| Naphthalene | 22.8 | 1.00 | 20.00 | 0 | 114 | 58.7 | 119 | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1305056
**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **1305050-001AMS** SampType: **MS** Units: **µg/L** Prep Date: **5/14/2013** RunNo: **8518**
Client ID: **BATCH** Batch ID: **R8518** Analysis Date: **5/14/2013** SeqNo: **169789**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,3-Trichlorobenzene | 19.5 | 4.00 | 20.00 | 0 | 97.5 | 50.7 | 113 | | | | |
| Surr: Dibromofluoromethane | 45.9 | | 50.00 | | 91.8 | 72.1 | 122 | | | | |
| Surr: Toluene-d8 | 47.0 | | 50.00 | | 94.1 | 62.1 | 129 | | | | |
| Surr: 1-Bromo-4-fluorobenzene | 44.5 | | 50.00 | | 89.0 | 66.8 | 124 | | | | |

**NOTES:**
S - Outlying QC recoveries were observed. The method is in control as indicated by the LCS.

Sample ID: **1305056-001ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **5/14/2013** RunNo: **8518**
Client ID: **COND-1-051013** Batch ID: **R8518** Analysis Date: **5/14/2013** SeqNo: **169791**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane (CFC-12) | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Chloromethane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Vinyl chloride | ND | 0.200 | | | | | | 0 | 0 | 30 | |
| Bromomethane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Trichlorofluoromethane (CFC-11) | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Chloroethane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,1-Dichloroethene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Methylene chloride | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| trans-1,2-Dichloroethene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Methyl tert-butyl ether (MTBE) | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,1-Dichloroethane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 2,2-Dichloropropane | ND | 2.00 | | | | | | 0 | 0 | 30 | |
| cis-1,2-Dichloroethene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Chloroform | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,1,1-Trichloroethane (TCA) | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,1-Dichloropropene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Carbon tetrachloride | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,2-Dichloroethane (EDC) | ND | 1.00 | | | | | | 0 | 0 | 30 | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1305056
**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **1305056-001ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **5/14/2013** RunNo: **8518**
Client ID: **COND-1-051013** Batch ID: **R8518** Analysis Date: **5/14/2013** SeqNo: **169791**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Trichloroethene (TCE) | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,2-Dichloropropane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Bromodichloromethane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Dibromomethane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| cis-1,3-Dichloropropene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Toluene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| trans-1,3-Dichloropropene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,1,2-Trichloroethane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,3-Dichloropropane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Tetrachloroethene (PCE) | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Dibromochloromethane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,2-Dibromoethane (EDB) | ND | 0.0100 | | | | | | 0 | 0 | 30 | |
| Chlorobenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,1,1,2-Tetrachloroethane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Ethylbenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| m,p-Xylene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| o-Xylene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Styrene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Isopropylbenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Bromoform | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,1,2,2-Tetrachloroethane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| n-Propylbenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Bromobenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,3,5-Trimethylbenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 2-Chlorotoluene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 4-Chlorotoluene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| tert-Butylbenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,2,3-Trichloropropane | ND | 1.00 | | | | | | 0 | 0 | 30 | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1305056
**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **1305056-001ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **5/14/2013** RunNo: **8518**
Client ID: **COND-1-051013** Batch ID: **R8518** Analysis Date: **5/14/2013** SeqNo: **169791**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trichlorobenzene | ND | 2.00 | | | | | | 0 | 0 | 30 | |
| sec-Butylbenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 4-Isopropyltoluene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,3-Dichlorobenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,4-Dichlorobenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| n-Butylbenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,2-Dichlorobenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,2-Dibromo-3-chloropropane | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,2,4-Trimethylbenzene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| Hexachlorobutadiene | ND | 4.00 | | | | | | 0 | 0 | 30 | |
| Naphthalene | ND | 1.00 | | | | | | 0 | 0 | 30 | |
| 1,2,3-Trichlorobenzene | ND | 4.00 | | | | | | 0 | 0 | 30 | |
| Surr: Dibromofluoromethane | 45.9 | | 50.00 | | 91.8 | 72.1 | 122 | | 0 | | |
| Surr: Toluene-d8 | 47.0 | | 50.00 | | 93.9 | 62.1 | 129 | | 0 | | |
| Surr: 1-Bromo-4-fluorobenzene | 48.3 | | 50.00 | | 96.7 | 66.8 | 124 | | 0 | | |

Sample ID: **LCS-R8518** SampType: **LCS** Units: **µg/L** Prep Date: **5/13/2013** RunNo: **8518**
Client ID: **LCSW** Batch ID: **R8518** Analysis Date: **5/13/2013** SeqNo: **169797**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane (CFC-12) | 19.9 | 1.00 | 20.00 | 0 | 99.5 | 43.1 | 127 | | | | |
| Chloromethane | 22.3 | 1.00 | 20.00 | 0 | 111 | 42.5 | 131 | | | | |
| Vinyl chloride | 23.1 | 0.200 | 20.00 | 0 | 116 | 56.2 | 130 | | | | |
| Bromomethane | 10.6 | 1.00 | 20.00 | 0 | 53.1 | 45.4 | 138 | | | | |
| Trichlorofluoromethane (CFC-11) | 22.2 | 1.00 | 20.00 | 0 | 111 | 64.7 | 129 | | | | |
| Chloroethane | 18.2 | 1.00 | 20.00 | 0 | 91.2 | 62.5 | 123 | | | | |
| 1,1-Dichloroethene | 22.8 | 1.00 | 20.00 | 0 | 114 | 60.7 | 146 | | | | |
| Methylene chloride | 22.1 | 1.00 | 20.00 | 0 | 111 | 60.3 | 135 | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1305056
**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **LCS-R8518** SampType: **LCS** Units: **µg/L** Prep Date: **5/13/2013** RunNo: **8518**
Client ID: **LCSW** Batch ID: **R8518** Analysis Date: **5/13/2013** SeqNo: **169797**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| trans-1,2-Dichloroethene | 23.6 | 1.00 | 20.00 | 0 | 118 | 71.3 | 129 | | | | |
| Methyl tert-butyl ether (MTBE) | 23.4 | 1.00 | 20.00 | 0 | 117 | 75.4 | 123 | | | | |
| 1,1-Dichloroethane | 21.5 | 1.00 | 20.00 | 0 | 107 | 71.3 | 129 | | | | |
| 2,2-Dichloropropane | 20.8 | 2.00 | 20.00 | 0 | 104 | 37.8 | 132 | | | | |
| cis-1,2-Dichloroethene | 22.0 | 1.00 | 20.00 | 0 | 110 | 67.5 | 127 | | | | |
| Chloroform | 24.4 | 1.00 | 20.00 | 0 | 122 | 70.3 | 123 | | | | |
| 1,1,1-Trichloroethane (TCA) | 24.0 | 1.00 | 20.00 | 0 | 120 | 67.9 | 134 | | | | |
| 1,1-Dichloropropene | 23.5 | 1.00 | 20.00 | 0 | 118 | 72.1 | 133 | | | | |
| Carbon tetrachloride | 23.5 | 1.00 | 20.00 | 0 | 118 | 68 | 136 | | | | |
| 1,2-Dichloroethane (EDC) | 24.1 | 1.00 | 20.00 | 0 | 121 | 65.8 | 126 | | | | |
| Benzene | 24.2 | 1.00 | 20.00 | 0 | 121 | 75.2 | 124 | | | | |
| Trichloroethene (TCE) | 23.8 | 1.00 | 20.00 | 0 | 119 | 71.9 | 130 | | | | |
| 1,2-Dichloropropane | 22.0 | 1.00 | 20.00 | 0 | 110 | 71.9 | 131 | | | | |
| Bromodichloromethane | 24.0 | 1.00 | 20.00 | 0 | 120 | 70 | 130 | | | | |
| Dibromomethane | 23.5 | 1.00 | 20.00 | 0 | 118 | 74.2 | 125 | | | | |
| cis-1,3-Dichloropropene | 20.2 | 1.00 | 20.00 | 0 | 101 | 62.8 | 135 | | | | |
| Toluene | 23.9 | 1.00 | 20.00 | 0 | 120 | 75.2 | 129 | | | | |
| trans-1,3-Dichloropropene | 23.3 | 1.00 | 20.00 | 0 | 117 | 58.1 | 138 | | | | |
| 1,1,2-Trichloroethane | 24.0 | 1.00 | 20.00 | 0 | 120 | 65.4 | 128 | | | | |
| 1,3-Dichloropropane | 22.1 | 1.00 | 20.00 | 0 | 110 | 71.9 | 131 | | | | |
| Tetrachloroethene (PCE) | 25.3 | 1.00 | 20.00 | 0 | 127 | 52.4 | 140 | | | | |
| Dibromochloromethane | 23.8 | 1.00 | 20.00 | 0 | 119 | 68.7 | 139 | | | | |
| 1,2-Dibromoethane (EDB) | 21.7 | 0.0100 | 20.00 | 0 | 108 | 71.2 | 129 | | | | |
| Chlorobenzene | 19.9 | 1.00 | 20.00 | 0 | 99.5 | 77.2 | 122 | | | | |
| 1,1,1,2-Tetrachloroethane | 21.2 | 1.00 | 20.00 | 0 | 106 | 76.2 | 130 | | | | |
| Ethylbenzene | 19.7 | 1.00 | 20.00 | 0 | 98.7 | 78 | 127 | | | | |
| m,p-Xylene | 39.8 | 1.00 | 40.00 | 0 | 99.6 | 77.5 | 130 | | | | |
| o-Xylene | 24.5 | 1.00 | 20.00 | 0 | 122 | 77.6 | 126 | | | | |
| Styrene | 26.6 | 1.00 | 20.00 | 0 | 133 | 66.8 | 137 | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1305056
**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **LCS-R8518** SampType: **LCS** Units: **µg/L** Prep Date: **5/13/2013** RunNo: **8518**
Client ID: **LCSW** Batch ID: **R8518** Analysis Date: **5/13/2013** SeqNo: **169797**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Isopropylbenzene | 20.0 | 1.00 | 20.00 | 0 | 100 | 75.9 | 133 | | | | |
| Bromoform | 21.4 | 1.00 | 20.00 | 0 | 107 | 69.9 | 142 | | | | |
| 1,1,2,2-Tetrachloroethane | 19.7 | 1.00 | 20.00 | 0 | 98.3 | 68 | 134 | | | | |
| n-Propylbenzene | 19.7 | 1.00 | 20.00 | 0 | 98.6 | 77.1 | 133 | | | | |
| Bromobenzene | 21.3 | 1.00 | 20.00 | 0 | 107 | 71.1 | 131 | | | | |
| 1,3,5-Trimethylbenzene | 21.6 | 1.00 | 20.00 | 0 | 108 | 76.2 | 133 | | | | |
| 2-Chlorotoluene | 19.4 | 1.00 | 20.00 | 0 | 97.1 | 67.1 | 137 | | | | |
| 4-Chlorotoluene | 19.8 | 1.00 | 20.00 | 0 | 99.0 | 70.7 | 132 | | | | |
| tert-Butylbenzene | 21.1 | 1.00 | 20.00 | 0 | 106 | 71.3 | 139 | | | | |
| 1,2,3-Trichloropropane | 20.4 | 1.00 | 20.00 | 0 | 102 | 70.8 | 132 | | | | |
| 1,2,4-Trichlorobenzene | 23.0 | 2.00 | 20.00 | 0 | 115 | 61.4 | 139 | | | | |
| sec-Butylbenzene | 19.8 | 1.00 | 20.00 | 0 | 99.0 | 77.4 | 136 | | | | |
| 4-Isopropyltoluene | 19.3 | 1.00 | 20.00 | 0 | 96.3 | 78.1 | 131 | | | | |
| 1,3-Dichlorobenzene | 22.4 | 1.00 | 20.00 | 0 | 112 | 73.5 | 125 | | | | |
| 1,4-Dichlorobenzene | 21.2 | 1.00 | 20.00 | 0 | 106 | 71.4 | 125 | | | | |
| n-Butylbenzene | 22.5 | 1.00 | 20.00 | 0 | 113 | 69.8 | 138 | | | | |
| 1,2-Dichlorobenzene | 22.7 | 1.00 | 20.00 | 0 | 114 | 74.2 | 123 | | | | |
| 1,2-Dibromo-3-chloropropane | 25.5 | 1.00 | 20.00 | 0 | 128 | 66.1 | 138 | | | | |
| 1,2,4-Trimethylbenzene | 20.5 | 1.00 | 20.00 | 0 | 102 | 72.3 | 133 | | | | |
| Hexachlorobutadiene | 22.4 | 4.00 | 20.00 | 0 | 112 | 60.9 | 141 | | | | |
| Naphthalene | 24.7 | 1.00 | 20.00 | 0 | 124 | 58.2 | 140 | | | | |
| 1,2,3-Trichlorobenzene | 22.4 | 4.00 | 20.00 | 0 | 112 | 61.3 | 133 | | | | |
| Surr: Dibromofluoromethane | 46.2 | | 50.00 | | 92.3 | 72.1 | 122 | | | | |
| Surr: Toluene-d8 | 48.1 | | 50.00 | | 96.2 | 62.1 | 129 | | | | |
| Surr: 1-Bromo-4-fluorobenzene | 44.5 | | 50.00 | | 89.0 | 66.8 | 124 | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1305056
**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **MB-R8518** SampType: **MBLK** Units: **µg/L** Prep Date: **5/13/2013** RunNo: **8518**
Client ID: **MBLKW** Batch ID: **R8518** Analysis Date: **5/13/2013** SeqNo: **169798**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane (CFC-12) | ND | 1.00 | | | | | | | | | |
| Chloromethane | ND | 1.00 | | | | | | | | | |
| Vinyl chloride | ND | 0.200 | | | | | | | | | |
| Bromomethane | ND | 1.00 | | | | | | | | | |
| Trichlorofluoromethane (CFC-11) | ND | 1.00 | | | | | | | | | |
| Chloroethane | ND | 1.00 | | | | | | | | | |
| 1,1-Dichloroethene | ND | 1.00 | | | | | | | | | |
| Methylene chloride | ND | 1.00 | | | | | | | | | |
| trans-1,2-Dichloroethene | ND | 1.00 | | | | | | | | | |
| Methyl tert-butyl ether (MTBE) | ND | 1.00 | | | | | | | | | |
| 1,1-Dichloroethane | ND | 1.00 | | | | | | | | | |
| 2,2-Dichloropropane | ND | 2.00 | | | | | | | | | |
| cis-1,2-Dichloroethene | ND | 1.00 | | | | | | | | | |
| Chloroform | ND | 1.00 | | | | | | | | | |
| 1,1,1-Trichloroethane (TCA) | ND | 1.00 | | | | | | | | | |
| 1,1-Dichloropropene | ND | 1.00 | | | | | | | | | |
| Carbon tetrachloride | ND | 1.00 | | | | | | | | | |
| 1,2-Dichloroethane (EDC) | ND | 1.00 | | | | | | | | | |
| Benzene | ND | 1.00 | | | | | | | | | |
| Trichloroethene (TCE) | ND | 1.00 | | | | | | | | | |
| 1,2-Dichloropropane | ND | 1.00 | | | | | | | | | |
| Bromodichloromethane | ND | 1.00 | | | | | | | | | |
| Dibromomethane | ND | 1.00 | | | | | | | | | |
| cis-1,3-Dichloropropene | ND | 1.00 | | | | | | | | | |
| Toluene | ND | 1.00 | | | | | | | | | |
| trans-1,3-Dichloropropene | ND | 1.00 | | | | | | | | | |
| 1,1,2-Trichloroethane | ND | 1.00 | | | | | | | | | |
| 1,3-Dichloropropane | ND | 1.00 | | | | | | | | | |
| Tetrachloroethene (PCE) | ND | 1.00 | | | | | | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1305056
**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **MB-R8518** SampType: **MBLK** Units: **µg/L** Prep Date: **5/13/2013** RunNo: **8518**
Client ID: **MBLKW** Batch ID: **R8518** Analysis Date: **5/13/2013** SeqNo: **169798**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dibromochloromethane | ND | 1.00 | | | | | | | | | |
| 1,2-Dibromoethane (EDB) | ND | 0.0100 | | | | | | | | | |
| Chlorobenzene | ND | 1.00 | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 1.00 | | | | | | | | | |
| Ethylbenzene | ND | 1.00 | | | | | | | | | |
| m,p-Xylene | ND | 1.00 | | | | | | | | | |
| o-Xylene | ND | 1.00 | | | | | | | | | |
| Styrene | ND | 1.00 | | | | | | | | | |
| Isopropylbenzene | ND | 1.00 | | | | | | | | | |
| Bromoform | ND | 1.00 | | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 1.00 | | | | | | | | | |
| n-Propylbenzene | ND | 1.00 | | | | | | | | | |
| Bromobenzene | ND | 1.00 | | | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 1.00 | | | | | | | | | |
| 2-Chlorotoluene | ND | 1.00 | | | | | | | | | |
| 4-Chlorotoluene | ND | 1.00 | | | | | | | | | |
| tert-Butylbenzene | ND | 1.00 | | | | | | | | | |
| 1,2,3-Trichloropropane | ND | 1.00 | | | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 2.00 | | | | | | | | | |
| sec-Butylbenzene | ND | 1.00 | | | | | | | | | |
| 4-Isopropyltoluene | ND | 1.00 | | | | | | | | | |
| 1,3-Dichlorobenzene | ND | 1.00 | | | | | | | | | |
| 1,4-Dichlorobenzene | ND | 1.00 | | | | | | | | | |
| n-Butylbenzene | ND | 1.00 | | | | | | | | | |
| 1,2-Dichlorobenzene | ND | 1.00 | | | | | | | | | |
| 1,2-Dibromo-3-chloropropane | ND | 1.00 | | | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 1.00 | | | | | | | | | |
| Hexachlorobutadiene | ND | 4.00 | | | | | | | | | |
| Naphthalene | ND | 1.00 | | | | | | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Date:** *5/16/2013*

**Work Order:** 1305056
**CLIENT:** PES Environmental, Inc.
**Project:** Manhattan Village

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **MB-R8518** SampType: **MBLK** Units: **µg/L** Prep Date: **5/13/2013** RunNo: **8518**
Client ID: **MBLKW** Batch ID: **R8518** Analysis Date: **5/13/2013** SeqNo: **169798**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,3-Trichlorobenzene | ND | 4.00 | | | | | | | | | |
| Surr: Dibromofluoromethane | 45.8 | | 50.00 | | 91.5 | 72.1 | 122 | | | | |
| Surr: Toluene-d8 | 46.6 | | 50.00 | | 93.1 | 62.1 | 129 | | | | |
| Surr: 1-Bromo-4-fluorobenzene | 48.2 | | 50.00 | | 96.5 | 66.8 | 124 | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

# Sample Log-In Check List

| | |
|---|---|
| Client Name: **PES** | Work Order Number: **1305056** |
| Logged by: **Chelsea Ward** | Date Received: **5/10/2013 12:15:00 PM** |

## *Chain of Custody*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Were custodial seals present? | Yes | ☐ | No | ☐ | Not Required | ☑ |
| 2. | Is Chain of Custody complete? | Yes | ☑ | No | ☐ | Not Present | ☐ |
| 3. | How was the sample delivered? | Client | | | | | |

## *Log In*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4. | Coolers are present? | Yes | ☐ | No | ☑ | NA | ☐ |
| | **Samples received straight from field, see COC.** | | | | | | |
| 5. | Was an attempt made to cool the samples? | Yes | ☐ | No | ☐ | NA | ☑ |
| 6. | Were all coolers received at a temperature of >0° C to 10.0°C | Yes | ☐ | No | ☐ | NA | ☑ |
| 7. | Sample(s) in proper container(s)? | Yes | ☑ | No | ☐ | | |
| 8. | Sufficient sample volume for indicated test(s)? | Yes | ☑ | No | ☐ | | |
| 9. | Are samples properly preserved? | Yes | ☑ | No | ☐ | | |
| 10. | Was preservative added to bottles? | Yes | ☐ | No | ☑ | NA | ☐ |
| 11. | Is there headspace present in VOA vials? | Yes | ☐ | No | ☑ | NA | ☐ |
| 12. | Did all sample containers arrive in good condition?(unbroken) | Yes | ☑ | No | ☐ | | |
| 13. | Does paperwork match bottle labels? | Yes | ☑ | No | ☐ | | |
| 14. | Are matrices correctly identified on Chain of Custody? | Yes | ☑ | No | ☐ | | |
| 15. | Is it clear what analyses were requested? | Yes | ☑ | No | ☐ | | |
| 16. | Were all holding times able to be met? | Yes | ☑ | No | ☐ | | |

## *Special Handling (if applicable)*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17. | Was client notified of all discrepancies with this order? | Yes | ☐ | No | ☐ | NA | ☑ |

| | | | |
|---|---|---|---|
| Person Notified: | | Date: | |
| By Whom: | | Via: | ☐ eMail ☐ Phone ☐ Fax ☐ In Person |
| Regarding: | | | |
| Client Instructions: | | | |

18. Additional remarks/Disrepancies

**Item Information**

# Chain of Custody Record

**Fremont Analytical**

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (internal): 1305056

Date: 5-10-13

Page: 1 of: 1

Client: PES
Address: 1215 4th Avenue Suite 1350
City, State, Zip: Seattle, WA 98161 Tel: 206-529-3980
Reports To (PM): Matt Dahl Fax: Email: MDahl@pesenv.com

Project Name: Manhattan Village
Location: Normandy Park, WA
Collected by: Karsten Springstead
Project No: 1358.001.01.007

| | Sample Name | Sample Date | Sample Time | Sample Type (Matrix) | VOC (EPA 8260) | cVX/BTEX by EPA 8021b | BTEX by 8260 | Gasoline Range Organics | Hydrocarbon Identification (HCID) | Diesel/Heavy Oil Range Organics | SEMI VOL (EPA 8270) | PAH (EPA 8270 - SIM) | PCBs (EPA 8082) | Cl Pesticides (EPA 8081) | Cl Herbicides (EPA 8151A) | Metals* (6020 / 200.8) | Total (T) | Dissolved (D) | Anions (IC)** | Comments/Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | COND-1-051013 | 5-10-13 | 930 | W | X | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | |

*Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

**Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Special Remarks: Report to MRLs
EDD in EIM Format

| Relinquished | Date/Time | Received | Date/Time |
|---|---|---|---|
| x | 5-10-13 /12:15 | | 5/10/13 12:15 |
| Relinquished | Date/Time | Received | Date/Time |
| x | | x | |

TAT --> Next Day 2 Day 3 Day STD

Distribution: White - Lab, Yellow - File, Pink - Originator

www.fremontanalytical.com

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 1665013 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 |
|---|---|---|---|
| WAH000028116 | 1 | 1800 337 7455 | 000323653 JJK |

5. Generator's Name and Mailing Address: Harris Family LTD Partnership, 1001 Fourth Avenue, Suite 4500, Seattle, WA 98154-1192, Attn: Courtney Selm
Generator's Phone:
Generator's Site Address (if different than mailing address): 17817 1st Ave South, Normandy Park, WA 98148

6. Transporter 1 Company Name: NRC Environmental Services — U.S. EPA ID Number: WAH000036171

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

8. Designated Facility Name and Site Address: Burlington Environmental, 20245 77th Ave S, Kent WA 98032 — U.S. EPA ID Number: WAD991281767
Facility's Phone:

| 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. UN3082 Waste Environmentally Hazardous Substance, Liquid n.o.s., 9, PGII | 12 | ~~DT~~ TF | 700 | gal. | F002 | | |
| | 2. | | | | | | | |
| | 3. | | | | | | | |
| | 4. | | | | | | | |

14. Special Handling Instructions and Additional Information: Profile #542336-00

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: Harris Family LTD Partnership — Signature: D. E Harris — Month: June — Day: 15 — Year: 2013

INTL
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: Jason Fryberg | Jason Fryberg | 6 | 20 | 13 |
| 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. |
|---|---|---|---|
| H082 | | | |

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: Esperanza Gallegos — Signature: C. Gallegos — Month: 6 — Day: 20 — Year: 13

5085Y

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

# This Memorandum

is an acknowledgment that a Bill of Lading has been issued and is not Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

Shipper No. 011983

Carrier No. T# 28X

Page _____ of _____

MARINE VACUUM SERVICE INC.
(Name of carrier) ( SCAC)

Date 6.14.13

On Collect on Delivery shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec.1.

**TO:**
Consignee MARINE VACUUM SERVICE INC.
Street 1516 S. GRAHAM ST.
City SEATTLE State, WA Zip Code 98108

**FROM:**
Shipper Pacific Environmental Service
Street 17835 1st AVE. S.
City Seattle State WA Zip Code
24 hr. Emergency Contact Tel. No. 800-540-7491

Route

Vehicle Number

| No. of Units & Container Type | HM | BASIC DESCRIPTION Proper Shipping Name, Hazard Class UN or NA Number, Packing Group or UN or NA Number, Proper Shipping Name, Hazard Class, Packing Group | TOTAL QUANTITY (Weight, Volume, Gallons, etc.) | WEIGHT (Subject to Correction) | RATE | CHARGES (For Carrier Use Only) |
|---|---|---|---|---|---|---|
| 1 1 | | Non Regulated Liquid (Water). | 350 gal. | | | |

**PLACARDS TENDERED: YES ☐ NO ☐**

Note — (1) Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property, as follows: "The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding _____ per _____."
(2) Where the applicable tariff provisions specify a limitation of the carrier's liability absent a release or a value declaration by the shipper and the shipper does not release the carrier's liability or declare a value, the carrier's liability shall be limited to the extent provided by such provisions. See NMFC Item 172.
(3) Commodities requiring special or additional care or attention in handling or stowing must be so marked and packaged as to ensure safe transportation. See Section 2(e) of item 360, Bills of Lading, Freight Bills and Statements of Charges and Section 1(a) of the Contract Terms and Conditions for a list of such articles.

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 labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

_____ Signature

REMIT C.O.D. TO: ADDRESS

**COD** Amt: $

Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

_____ (Signature of Consignor)

C.O.D. FEE: PREPAID ☐ COLLECT ☐ $

TOTAL CHARGES $

FREIGHT CHARGES
FREIGHT PREPAID except when box at right is checked ☐ Check box if charges are to be collect

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.
Shipper hereby certifies that he is familiar with all the lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER [signature] "ON BEHALF OF DR. STANLEY HARRIS AND LINDA HARRIS"

PER

CARRIER MARINE VACUUM SERVICE INC.

PER [signature]

DATE 6.14.13

4

Permanent post-office address of shipper.

**PES Environmental, Inc.**
**Engineering & Environmental Services**

October 2, 2013

**1358.001.01**

Ms. Courtney Seim
Riddell Williams, P.S.
1001 Fourth Avenue, Suite 4500
Seattle, Washington 98154

Mr. Bob DiJulio
Wolfstone Panchot & Block, P.S.
1111 Third Avenue, Suite 1800
Seattle, Washington 98101

**AIR SPARGING PILOT TEST**
**MANHATTAN VILLAGE SHOPPING CENTER AND HARRIS PROPERTIES**
**NORMANDY PARK, WASHINGTON**

Dear Ms. Seim and Mr. DiJulio:

PES Environmental, Inc. (PES) has prepared this letter to summarize the recent air sparging pilot test for the Manhattan Village Shopping Center (MVSC) property located at 17835 First Avenue South (the "MVSC property") and the Harris property located at 17817 – 17825 First Avenue South in Normandy Park, Washington (the "Harris property"), collectively referred to as the "Property." The location and current features of the Property are shown on Figures 1 and 2. The pilot test area is shown on Figure 3. This work was conducted in accordance with Task 4 of PES's *Revised Scope of Work and Cost Estimate*, dated January 25, 2013.

PES conducted the air sparging pilot test on June 20, 2013 to determine the feasibility of air sparging to reduce concentrations of tetrachloroethene (PCE) in the saturated zone, and to collect information for design of a full-scale air sparging system. The following information was collected and evaluated during the pilot test:

- Injected airflow rates;
- Injected air pressures;
- Ground water response to injected air;
- Vadose zone response to injected air; and
- Area of influence affected by sparging.

## TECHNOLOGY DESCRIPTION

Air sparging is an insitu remediation technology that involves injection of air into the subsurface saturated zone to reduce concentrations of volatile organic compounds (VOCs) or aerobically biodegradable contaminants dissolved in groundwater and adsorbed to soil. Since PCE does not biodegrade aerobically, volatilization through air stripping is the primary mechanism for reduction of saturated zone PCE concentration. Air sparging creates air channels and transient pockets of air in the saturated zone, where mass transfer can occur through partitioning of PCE from the dissolved and adsorbed phases to the vapor-phase. Due to density difference between air and water, the PCE charged air will move upwards into the vadose zone where the PCE can be recovered by a soil vapor extraction system.

For air sparging to be effective, the injected air must come in contact with the contaminated soil and groundwater. Therefore, it is important to know how the injected air will travel both below and above the water table. The air sparging pilot test injection well is situated so that monitoring wells at different distances and directions from the injection point can provide data to determine the area that can be effectively influenced. The following parameters are commonly evaluated to determine the effective air injection area-of-influence during the pilot test:

- Groundwater response parameters – dissolved oxygen (DO) concentration, and depth to groundwater.

- Vadose zone response parameters – air pressure, VOC concentrations, and oxygen concentration.

Lateral movement of injected air below the water table can be monitored in the saturated zone through increases in DO concentrations and changes in water level in nearby monitoring wells. Movement of injected air from the saturated zone and into the vadose zone can be monitored by measuring changes in air pressure, VOC concentrations, and oxygen concentrations.

## PILOT TEST WELL INSTALLATION

Drilling, installation, development, and surveying of air sparging pilot test well AS-1 was described in detail in the October 2, 2013 summary letter[1]. The well was installed on May 16 and 17, 2013 using a hollow stem auger drilling rig using 4¼-inch inside diameter (nominal 9-inch outside diameter) augers, operated by Holt Services, Inc., of Edgewood, Washington. The well was installed to a depth of approximately 46 feet below ground surface (bgs), and was installed one foot higher than planned due to the presence of a silt layer at 46.5 feet bgs. The well is constructed with nominal 1-inch diameter, flush-threaded Schedule 80 PVC blank casing, a 2-foot length of Schedule 80 PVC screen with 0.020-inch width slots, a 10x20 Colorado silica sand filter pack, and an annular seal of bentonite chips.

[1] PES Environmental, Inc. Revised *May 2013 Well Installation and Groundwater Monitoring, Manhattan Village Shopping Center and Harris Properties, Normandy, Park, Washington*. October 2.

## PILOT TEST DESCRIPTION

The air sparging pilot test consisted of baseline monitoring of the injection test well AS-1 and four selected monitoring wells (DC-10A, MW-10, KMW-2, and MW-11), and a three-step air sparging test in AS-1 to assess the aquifer and vadose zone performance of the testing area under different flow rates and pressures.

### Pilot Test Equipment

A portable reciprocating air compressor (MI-T-M model AM2-PH09-08M) was utilized to supply air to the test well during the pilot study. The air compressor was rated at 19.6 cubic feet per minute (cfm) at 40 pounds per square inch (psi). The compressor fed directly into an inline filter/regulator assembly which consisted of an oil filter, particulate filter, pressure regulator, pressure gauge, air flow meter (rotameter), and air flow regulator prior to connecting to pilot test well AS-1 using an air-tight quick-connect fitting. The connecting air lines consisted of 3/8-inch rubber high pressure hose with brass quick-connect fittings.

Pilot test monitoring equipment consisted of a water level indicator (Solinist 101) and a down-well DO meter (Insite IG 3100) for monitoring groundwater response parameters; and a 0 to 5 inches of water column (in.w.c.) Magnehelic gauge, oxygen meter (Landtec GEM 2000), and photoionization detector (PID, MiniRae 3000) for monitoring vadose zone response parameters. Monitoring equipment was cleaned, verified in good working condition, and calibrated prior to starting the pilot test.

Monitoring wells DC-10A, MW-10, KMW-2, and MW-11 were fitted with 2-inch slip caps, barbed fitting, ball valve, and silicone flex tubing to allow monitoring of vadose zone response parameters. The slip caps remained on the monitoring wells for the entire duration of the pilot test, except for during water level and DO monitoring.

### Pilot Test Monitoring

Pilot test monitoring was conducted in AS-1 and in nearby monitoring wells. The monitoring wells, chosen based on their proximity, completion depth, and direction from AS-1, included DC-10A (15 feet west), MW-10 (20 feet northeast), KMW-2 (21 feet southeast), and MW-11(75 feet east) as shown on Figure 3. Well completion details for each well are summarized in Table 1.

Baseline monitoring included measuring vadose zone parameters (pressure, oxygen gas content, and VOC concentration) and groundwater parameters (depth to water and DO) prior to air sparging. Periodic monitoring for these same parameters was conducted every 20 minutes during the first hour of the pilot test, and approximately every 30 minutes until the completion of the test. AS-1 was monitored at approximately the same frequency for flow rate and injection pressure.

Vadose zone parameters were always monitored before the groundwater parameters to allow pressure to build up under the slip caps and prevent ambient air from entering the well casing during monitoring, potentially affecting the measurement. Vadose zone vapors were purged only long enough to maintain a steady measurement on the oxygen meter and PID (for both baseline and periodic monitoring). After the vadose measurements were collected, the slip cap was temporarily removed for water level and DO measurements, and replaced before moving on to the next well.

## Pilot Test Procedures

Prior to starting the pilot test and conducting baseline monitoring, the onsite soil vapor extraction (SVE) system was turned off. The SVE system was offline approximately 30 minutes prior to baseline monitoring and 2 hours prior to air sparging. All equipment to be used during the pilot test was inspected, cleaned, and calibrated. Distances between the test well and surrounding monitoring wells were obtained using a measuring wheel.

The pilot test was designed to occur in three steps in order to assess the groundwater and vadose zone response at multiple injection pressures and flow rates. A ceiling pressure of 20 psi was established in order prevent fracturing the formation or damaging the injection well seal. At the start of the test, the pressure regulator was slowly opened until breakout was observed. The breakout pressure is the minimum injection pressure required to dewater the well casing to the top of the screened interval and force air flow out of the well screen. The breakout pressure occurred slightly below 4 psi, which is the lowest tick on the pilot test pressure gauge.

Once breakout was achieved, pilot test Step 1 was commenced by adjusting the pressure regulator to 4 psi in order to maintain a steady air flow rate into the aquifer of approximately 6 standard cubic feet per minute (scfm). Pilot test Steps 2 and 3 were started after approximately 100 minutes and 198 minutes of total elapsed time, respectively. Step 2 included increasing the injection pressure to 8 psi and resulted in an air sparging flow rate of 9.2 scfm. Step 3 included increasing the injection pressure to 14 psi and resulted in an air sparging flow rate of 13.5 scfm. Each pilot test step was observed and monitored until monitoring parameters became relatively stable. The pilot test was concluded after 263 minutes of running time.

## RESULTS AND DISCUSSION

As described above, the air sparge test consisted of injecting air into AS-1 at three different pressures and corresponding flow rates while measuring saturated and vadose zone parameters in DC-10A, MW-10, KMW-2, and MW-11 throughout the test. Data collected during the pilot test are summarized in Table 2.

## Groundwater

Groundwater was monitored for changes in groundwater elevation and DO. A groundwater mound was observed shortly after pilot test startup. Monitoring wells DC-10A, MW-10, and KMW-2 showed a peak groundwater elevation rise of 0.33 feet, 0.23 feet, and 0.14 feet, respectively during the first round of monitoring well measurements. After this initial rise, groundwater elevations began to return to static during the course of the test. Increasing air flow into the aquifer during each step of the test, temporarily slowed the rate that the groundwater was returning to static, but a new groundwater mound was not observed during these steps. No significant change in groundwater elevation was observed in MW-11.

Changes in DO were observed in monitoring wells DC-10, MW-10, and KMW-2 during the pilot test. No significant changes in DO were observed in MW-11. An overall increase of DO was observed in wells MW-10 (5.7 milligrams per liter [mg/L] to 6.6 mg/L) and KMW-2 (6.8 mg/L to 7.8 mg/L). In each of these wells, the elevated DO concentration stabilized during the middle of the second step of the test after approximately 130 minutes, and increasing the flow rate in Step 3 had little additional effect. Monitoring well DC-10A, being the closest monitoring well to AS-1, was expected to have the greatest increase in DO. However, DO in DC-10A actually decreased during Step 1 (8.8 mg/L to 8.0 mg/L) before stabilizing at 7.9 mg/L for the remainder of the test. Although DO concentrations in DC-10 were apparently affected by air sparging, it is not clear why DO concentrations decreased during the test.

## Vadose Zone

The vadose zone was monitored for changes in air pressure, VOC concentrations, and oxygen gas content. An increase in vadose zone pressure was observed shortly after pilot test startup in monitoring wells DC-10A, MW-10, and KMW-2. No increase in pressure was observed from MW-11. During each step of the injection, pressures continued to increase in wells DC-10A, MW-10, and KMW-2. For each injection step at AS-1 (4, 8, and 14 psi), DC-10A stabilized at approximately 0.8, 1.0, and 1.2-in.w.c.; MW-10 stabilized at approximately 0.6, 0.7, and 1.0-in.w.c.; and KMW-2 stabilized at approximately 0.4, 0.4, and 0.6-in.w.c.

Changes in VOC concentrations during the test were observed in MW-10, while VOC concentrations remained relatively steady in the other monitoring wells. At MW-10, VOC concentrations increased from 0.6 parts per million by volume (ppmV) to 1.0 ppmV after 151 minutes of elapsed time and returned to 0.6 ppmV during the later stages of the test.

Changes in oxygen gas content were observed in monitoring wells DC-10, MW-10, and KMW-2 during the pilot test. No changes in oxygen gas content were observed in MW-11. Baseline oxygen concentrations in all four wells were at atmospheric levels of 20.7 to 20.8%. Initially, oxygen content in DC-10, MW-10, and KMW-2 decreased to between 19.4 and 19.9% during the first two stages of the pilot test before trending upwards during the later portion of the test. The pilot test was not operated long enough for the final oxygen concentrations in DC-10, MW-10, and KMW-2 to achieve their baseline concentrations.

**Air Sparge Area of Influence**

As evidenced by DO, wellhead pressure, and migration of oxygen gas, apparent influence from AS-1 was observed in monitoring wells DC-10A, MW-10, and KMW-2, which are located approximately 15 feet, 20 feet, and 21 feet from AS-1, respectively. Well MW-11, at 75 feet away from AS-1, was not impacted by the injection. Wellhead pressure increase was the primary indicator of air sparging influence in DC-10A, and both pressure and DO increases were primary indicators in MW-10 and KMW-2. The relative differences in pressure and DO between the monitoring wells suggest a degree of heterogeneity within the soil matrix.

The total extent of influence was observed out to 21 feet away from AS-1, although it is uncertain whether that entire 21 foot radius received adequate sparge coverage. Based on our experience, the effective radius of influence is likely between 10 and 15 feet

As most of the monitoring parameters began to stabilize during the second step of the injection test, an injection pressure of 8 psi and flow rate of approximately 9 to 10 scfm will be needed to maintain the suggested 10 to 15 foot radius of influence during a full scale application of this technology. The increased injection pressure and flow rate during the third step of the test resulted in minimal increases in dissolved oxygen or wellhead pressure.

## CONCLUSIONS AND RECOMMENDATIONS

Air sparging appears to be feasible technology for the Site. PES estimates an effective radius of influence of 10 to 15 feet under the pilot test conditions. The sparging test was conducted at the seasonal high groundwater elevation conditions, so a slightly smaller radius of influence would be expected during low groundwater. A larger radius of influence may likely be achieved by installing the sparging well screens two or three feet deeper than AS-1.

Observations of site conditions and review of historical data suggest that air sparging with soil vapor extraction is likely to remove additional adsorbed and dissolved phase PCE at the Site. Based on the results of this pilot test and the results of the May 2013 groundwater monitoring, PES generally agrees with the “target area to be remediated” shown on Figure 3 of the Request for Proposal[2] for treating the remaining source areas of PCE.

[2] Ridell Williams, PS and Wolfstone Panchot & Bloch, PS. Request for Proposal, Design of Remedial Action, Manhattan Village Shopping Center/ Harris Property Site, Normandy Park, Washington. November 14, 2012.

PES appreciates the opportunity to perform the air sparging pilot test work and we look forward to having further discussions. If you have any questions regarding this letter, or need any additional information, please feel free to contact either of us at (206) 529-3980.

Sincerely,

**PES ENVIRONMENTAL, INC.**

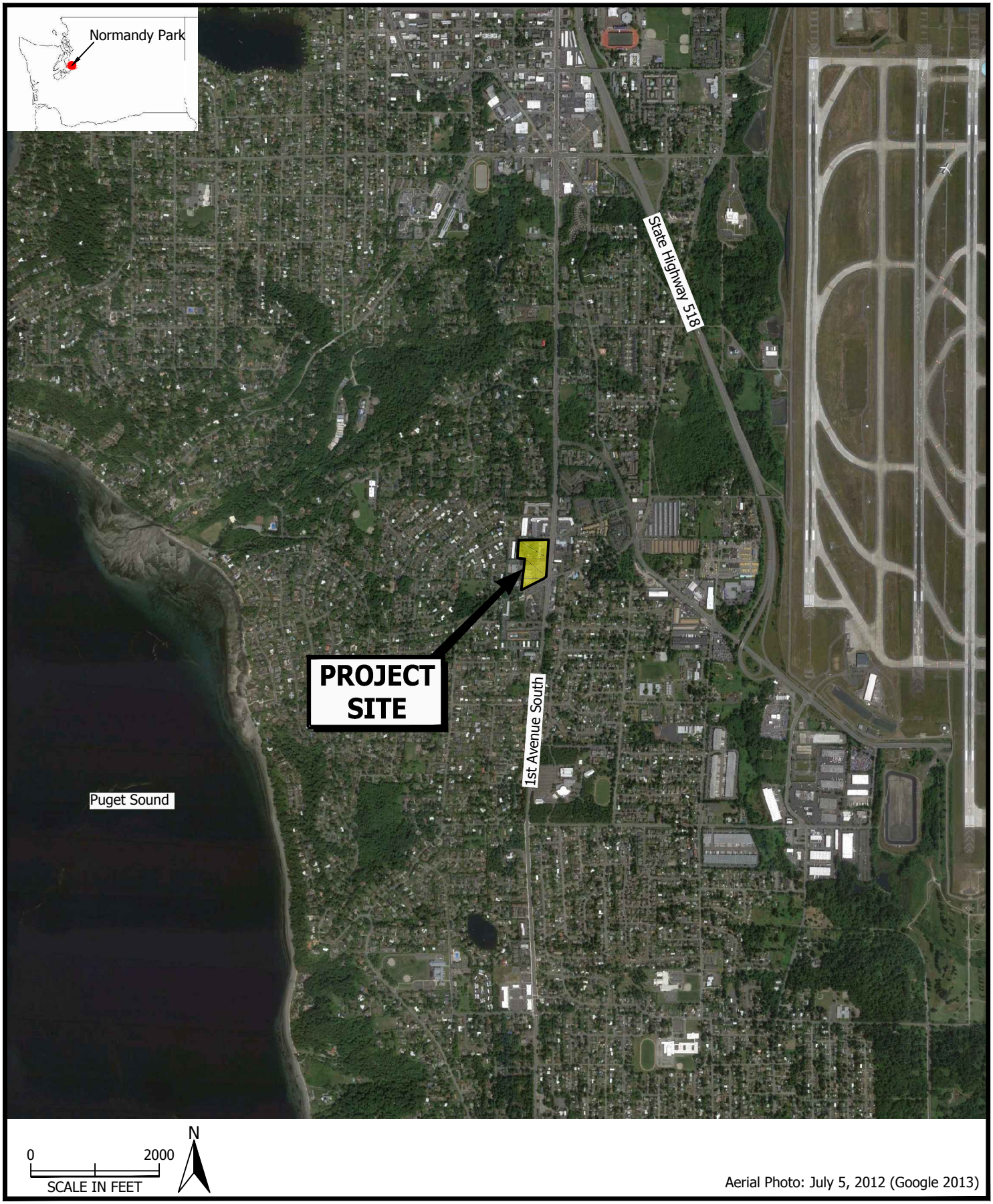
Jason L. Landskron, P.E.
Project Engineer

MATTHEW V. DAHL
STATE OF WASHINGTON
20366
REGISTERED
PROFESSIONAL ENGINEER

Matthew V. Dahl, P.E.
Senior Engineer

Attachments:

Figure 1 – Site Location Map
Figure 2 – Site Plan
Figure 3 – Pilot Test Area
Table 1 – Air Sparging Pilot Test Well Completion Summary
Table 2 – Air Sparging Pilot Test Data Summary




**PES Environmental, Inc.**
Engineering & Environmental Services

**Site Location Map**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

FIGURE
1

| 1358.001.01.003 | 1358-00101003_GW_1-2 | MVD | 6/13 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |

MW-9
SW 176th STREET
RESIDENCES
1st AVE SOUTH
MW-8
SW 177th STREET
MW-7
MW-6
RESIDENCES
DUNN LUMBER
DUNN LUMBER
WATER SUPPLY WELL
KMW-6
KMW-7
KMW-8
SW 178th STREET
KMW-3
DC-14
MW-5
DC-7
DC-8
KMW-5D
KMW-5
RESIDENCE
RESIDENCE
HARRIS PROPERTY
COMMERCIAL BUILDING
MW-14
DC-15
KMW-1
DC-20
2nd AVE SW
VACANT SHED
WELL HOUSE
DC-13
FORMER SEPTIC TANK
DC-17
DC-18
KMW-4
DC-5
DC-16
MW-16
MW-1
DC-12
MW-2
DC-6
MW-10
DC-9A
TREATMENT SYSTEM
FORMER LAUNDROMAT/ DRY CLEANER
DC-10B
AS-1
DC-9B
DC-10A
KMW-2
MW-11
MW-15
CONDOMINIUMS
DC-11
KMW-9
MW-13
DC-4
DC-3
DC-2
RETAINING WALL
DC-19
FORMER DAIRY QUEEN
PARKING LOT
SECOND BUILDING (VARIOUS SHOPS)
FOUR STAR DRY CLEANERS
MW-4
DC-1
DAY CARE
MANHATTAN VILLAGE SHOPPING CENTER
MW-3
MW-12
SUSPECTED SEPTIC TANK
QFC BUILDING

EXPLANATION

- Approximate Property Boundary
- DC-6 Missing or Destroyed Monitoring Well
- DC-9B Abandoned Monitoring Well
- MW-12 Shallow Monitoring Well
- DC-16 Deep Monitoring Well
- AS-1 Air Sparge Well

N

0 100

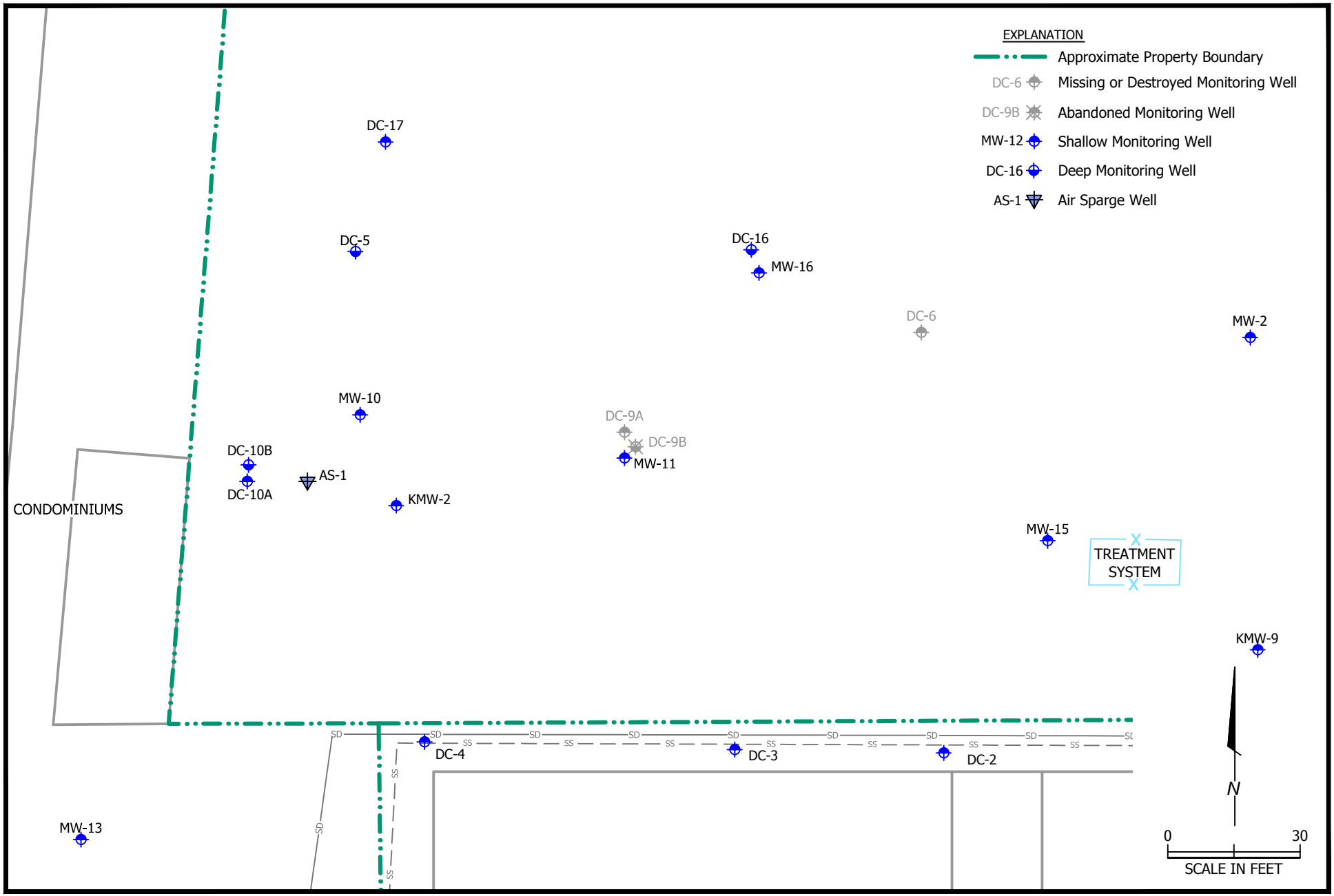
SCALE IN FEET

**PES Environmental, Inc.**
Engineering & Environmental Services

**Site Plan**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

FIGURE
2

| 1358.001.01.003 | 1358-00101004_Site_1-2 | MVD | 7/13 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |




**PES Environmental, Inc.**
Engineering & Environmental Services

**Pilot Test Area**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

FIGURE
3

| 1358.001.01.004 | 1358-00101004_Site_Detail | MVD | 8/13 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |

# Table 1
## Air Sparging Pilot Test Well Completion Summary
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Well ID | Installation Date | Well Construction | Monument | Elevation (NAVD 88) | | | Screened Interval (feet) | | Well Depth Below Ground Surface |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Top of Casing (ft) | Monument Rim (ft) | Ground Surface (ft) | Below Ground Surface | Below Top of Casing | |
| AS-1 | 5/17/2013 | 1" Sch 80 PVC, 0.010" slots | Aboveground | 310.59 | 310.64 | 307.34 | 43.8-45.8 | 47.1-49.1 | 45.8 |
| DC-10A | 4/5/1999 | 2" Sch 40 PVC, 0.010" slots | Flush | 307.93 | 307.97 | -- | 32-37 | -- | 37.0 |
| KMW-2 | 5/1/2006 | 2" Sch 40 PVC, 0.010" slots | Flush | 307.25 | 307.40 | -- | 30-40 | -- | 40.0 |
| MW-10 | 2/3/2011 | 2" Sch 40 PVC, 0.010" slots | Flush | 306.91 | 307.33 | -- | 32-42 | -- | 42.0 |
| MW-11 | 2/3/2011 | 2" Sch 40 PVC, 0.010" slots | Flush | 307.85 | 308.36 | -- | 32-42 | -- | 42.0 |

NOTES:

1. -- = not measured.
2. Top of casing (TOC) elevations and coordinates were surveyed by D.R. Strong Consulting Engineers, Inc. in February and May 2013.
3. Northing/Easting relative to the WA State Plane System North Zone (NAD 83).
4. Elevations in feet relative to the North American Vertical Datum (NAVD) of 1988.
5. Surveyed elevations are measured at the north side of the top of casing, surface monument rim, and adjacent ground surface.
6. Screened intervals are documented on boring logs and are typically based on a field measurements relative to ground surface at the time of drilling. Screened intervals relative to top of casing are estimated using field well construction measurements, and surveyed ground surface and top of casing elevations.

# Table 2
# Air Sparging Pilot Test Data Summary
# Manhattan Village Shopping Center and Harris Properties
# Normandy Park, Washington

| Well Identification | Elapsed Time (minute) | Injection Pressure (psig) | Flow Rate (scfm) | Depth to Water (feet below TOC) | Dissolved Oxygen (mg/L) | Pressure (in. $H_2O$) | VOC's (ppmV) | Oxygen (%) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| **INJECTION WELL** | | | | | | | | | |
| AS-1 | -- | -- | -- | 37.85 | -- | -- | -- | -- | Baseline monitoring. Approximately 9.25 feet of water above top of well screen. |
| | 0 | -- | -- | -- | -- | -- | -- | -- | Pilot test start |
| | 5 | 4 | 5.9 | -- | -- | -- | -- | -- | Breakout occurred less than 4 psi. Step 1 |
| | 18 | 4 | 6.1 | -- | -- | -- | -- | -- | |
| | 29 | 4 | 6.2 | -- | -- | -- | -- | -- | |
| | 46 | 4 | 6.1 | -- | -- | -- | -- | -- | |
| | 67 | 4 | 6.4 | -- | -- | -- | -- | -- | |
| | 77 | 4 | 6.6 | -- | -- | -- | -- | -- | |
| | 100 | 4 | 6.4 | -- | -- | -- | -- | -- | |
| | 101 | 8 | 9.2 | -- | -- | -- | -- | -- | Step 2 |
| | 117 | 8 | 9.2 | -- | -- | -- | -- | -- | |
| | 143 | 8 | 9.2 | -- | -- | -- | -- | -- | |
| | 169 | 8 | 9.2 | -- | -- | -- | -- | -- | |
| | 198 | 8 | 9.2 | -- | -- | -- | -- | -- | |
| | 199 | 14 | 13.5 | -- | -- | -- | -- | -- | Step 3 |
| | 215 | 14 | 13.5 | -- | -- | -- | -- | -- | |
| | 246 | 14 | 13.5 | -- | -- | -- | -- | -- | |
| | 263 | 14 | 13.5 | -- | -- | -- | -- | -- | |

# Table 2
## Air Sparging Pilot Test Data Summary
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Well Identification | Elapsed Time (minute) | Injection Pressure (psig) | Flow Rate (scfm) | Depth to Water (feet below TOC) | Dissolved Oxygen (mg/L) | Pressure (in. $H_2O$) | VOC's (ppmV) | Oxygen (%) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| **MONITORING WELLS** | | | | | | | | | |
| DC-10A<br><br>15 feet west of AS-1 | -- | -- | -- | 35.18 | 8.8 | 0.0 | 0.3 | 20.8 | Baseline monitoring |
| | 0 | -- | -- | -- | -- | -- | -- | -- | Pilot test start |
| | 11 | 4 | 6.1 | 34.85 | 7.7 | 0.6 | 0.2 | 20.7 | Step 1 |
| | 29 | 4 | 6.2 | 34.99 | 8.5 | 0.8 | 0.2 | 20.6 | |
| | 46 | 4 | 6.1 | 35.08 | 8.6 | 0.8 | 0.2 | 20.4 | |
| | 78 | 4 | 6.6 | 35.09 | 8.0 | 0.8 | 0.2 | 20.1 | |
| | 120 | 8 | 9.2 | 35.08 | 7.9 | 1.0 | 0.3 | 20.1 | Step 2 |
| | 144 | 8 | 9.2 | 35.10 | 7.9 | 1.0 | 0.3 | 19.9 | |
| | 170 | 8 | 9.2 | 35.14 | 7.9 | 1.0 | 0.3 | 20.0 | |
| | 215 | 14 | 13.5 | 35.11 | 7.9 | 1.3 | 0.2 | 20.1 | Step 3 |
| | 247 | 14 | 13.5 | 35.12 | 7.9 | 1.2 | 0.2 | 20.4 | |
| MW-10<br><br>20 feet northeast of AS-1 | -- | -- | -- | 34.16 | 6.2 | 0.0 | 0.6 | 20.7 | Baseline monitoring |
| | 0 | -- | -- | -- | -- | -- | -- | -- | Pilot test start |
| | 16 | 4 | 6.1 | 33.93 | 5.7 | 0.6 | 0.3 | 20.7 | Step 1 |
| | 33 | 4 | 6.2 | 34.04 | 5.2 | 0.6 | 0.4 | 19.4 | |
| | 48 | 4 | 6.1 | 34.08 | 5.7 | 0.7 | 0.9 | 19.3 | |
| | 84 | 4 | 6.6 | 34.11 | 5.5 | 0.6 | 0.9 | 19.4 | |
| | 125 | 8 | 9.2 | 34.13 | 6.3 | 0.7 | 0.9 | 19.5 | Step 2 |
| | 151 | 8 | 9.2 | 34.14 | 6.6 | 0.6 | 1.0 | 19.6 | |
| | 175 | 8 | 9.2 | 34.12 | 6.7 | 0.7 | 0.7 | 20.0 | |
| | 220 | 14 | 13.5 | 34.16 | 6.5 | 1.0 | 0.7 | 20.1 | Step 3 |
| | 248 | 14 | 13.5 | 34.17 | 6.6 | 1.0 | 0.6 | 20.3 | |

# Table 2
## Air Sparging Pilot Test Data Summary
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Well Identification | Elapsed Time (minute) | Injection Pressure (psig) | Flow Rate (scfm) | Depth to Water (feet below TOC) | Dissolved Oxygen (mg/L) | Pressure (in. $H_2O$) | VOC's (ppmV) | Oxygen (%) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| **MONITORING WELLS** | | | | | | | | | |
| KMW-2<br><br>21 feet east of AS-1 | -- | -- | -- | 34.44 | 6.8 | 0.0 | 0.4 | 20.7 | Baseline monitoring |
| | 0 | -- | -- | -- | -- | -- | -- | -- | Pilot test start |
| | 21 | 4 | 6.1 | 34.30 | 7.1 | 0.4 | 0.3 | 20.6 | Step 1 |
| | 37 | 4 | 6.2 | 34.36 | 7.0 | 0.3 | 0.4 | 19.5 | |
| | 56 | 4 | 6.1 | 34.41 | 7.1 | 0.4 | 0.5 | 19.4 | |
| | 88 | 4 | 6.6 | 34.40 | 7.3 | 0.4 | 0.4 | 19.4 | |
| | 132 | 8 | 9.2 | 34.40 | 7.5 | 0.4 | 0.4 | 19.5 | Step 2 |
| | 158 | 8 | 9.2 | 34.40 | 7.6 | 0.5 | 0.4 | 19.5 | |
| | 182 | 8 | 9.2 | 34.41 | 7.8 | 0.4 | 0.3 | 19.6 | |
| | 226 | 14 | 13.5 | 34.41 | 7.7 | 0.6 | 0.3 | 19.9 | Step 3 |
| | 255 | 14 | 13.5 | 34.42 | 7.8 | 0.6 | 0.3 | 20.2 | |
| MW-11<br><br>75 feet east of AS-1 | -- | -- | -- | 35.09 | 6.5 | 0.0 | 0.1 | 20.7 | Baseline monitoring |
| | 0 | -- | -- | -- | -- | -- | -- | -- | Pilot test start |
| | 22 | 4 | 6.1 | 35.10 | 6.7 | 0.0 | 0.0 | 20.6 | Step 1 |
| | 41 | 4 | 6.2 | 35.05 | 6.6 | 0.0 | 0.0 | 20.5 | |
| | 60 | 4 | 6.1 | 35.08 | 6.5 | 0.0 | 0.0 | 20.4 | |
| | 96 | 4 | 6.6 | 35.07 | 6.5 | 0.0 | 0.0 | 20.4 | |
| | 136 | 8 | 9.2 | 35.09 | 6.5 | 0.0 | 0.0 | 20.4 | Step 2 |
| | 162 | 8 | 9.2 | 35.09 | 6.5 | 0.0 | 0.0 | 20.4 | |
| | 188 | 8 | 9.2 | 35.11 | 6.5 | 0.0 | 0.0 | 20.4 | |
| | 232 | 14 | 13.5 | 35.11 | 6.6 | 0.0 | 0.0 | 20.5 | Step 3 |
| | 260 | 14 | 13.5 | 35.10 | 6.6 | 0.0 | 0.0 | 20.5 | |

# Table 2
## Air Sparging Pilot Test Data Summary
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Well Identification | Elapsed Time (minute) | Injection Pressure (psig) | Flow Rate (scfm) | Depth to Water (feet below TOC) | Dissolved Oxygen (mg/L) | Pressure (in. $H_2O$) | VOC's (ppmV) | Oxygen (%) | Comments |
|---|---|---|---|---|---|---|---|---|---|

Notes:

1. -- = not measured or not applicable.
2. psig = pounds per square inch gauge pressure.
3. scfm = standard cubic feet per minute. Field measurements, as recorded by the inline rotometer, were corrected to scfm to account for the compressability of air.
4. TOC = top of casing.
5. mg/L = milligrams per liter
6. in.H20 = inches of water column pressure.
7. VOCs = volatile organic compound concentration measured in parts per million by volume (ppmV) using a field photo-ionization detector.
8. % = percent.

**PES Environmental, Inc.**
**Engineering & Environmental Services**

October 2, 2013

**1358.001.01**

Ms. Courtney Seim
Riddell Williams, P.S.
1001 Fourth Avenue, Suite 4500
Seattle, Washington 98154

Mr. Bob DiJulio
Wolfstone Panchot & Block, P.S.
1111 Third Avenue, Suite 1800
Seattle, Washington 98101

**REVISED MAY 2013 WELL INSTALLATION AND GROUNDWATER MONITORING MANHATTAN VILLAGE SHOPPING CENTER AND HARRIS PROPERTIES NORMANDY PARK, WASHINGTON**

Dear Ms. Seim and Mr. DiJulio:

PES Environmental, Inc. (PES) has prepared this letter to summarize the recent well installation and groundwater monitoring and sampling event for the Manhattan Village Shopping Center (MVSC) property located at 17835 First Avenue South (the "MVSC property") and the Harris property located at 17817 – 17825 First Avenue South in Normandy Park, Washington (the "Harris property"), collectively referred to as the "Property." The location and current features of the Property are shown on Figures 1 and 2. This work was conducted in accordance with PES's *Revised Scope of Work and Cost Estimate*, dated January 25, 2013.

This letter summarizes the following activities:

- Installation of monitoring well MW-16 and air sparge pilot test well AS-1 on May 16 and 17, 2013;
- Well development on May 20 and 23, 2013;
- Searching for missing monitoring well DC-17 on May 20 and 23, 2013;
- Surveying conducted on May 28, 2013;
- Groundwater level monitoring on May 28, 2013; and
- Groundwater sampling conducted from May 28 to May 31, 2013.

## WELL INSTALLATION, DEVELOPMENT, AND SURVEYING

### Drilling and Well Installation

PES observed the installation of monitoring well MW-16 and air sparge pilot test well AS-1 on May 16 and 17, 2013. The wells were installed with a hollow stem auger drilling rig using 4¼-inch inside diameter ("i.d.", nominal 9-inch outside diameter ["o.d."]) augers, operated by Holt Services, Inc., of Edgewood, Washington. Monitoring well MW-16 was installed to a depth of approximately 42 feet below ground surface (bgs), and air sparge well AS-1 was installed to a depth of approximately 46 feet bgs. Well AS-1 was installed one foot higher than planned due to the presence of a silt layer at 46.5 feet bgs. The well locations are shown on Figure 2.

Soil samples were collected using a split barrel sampler at 5-foot intervals in boring MW-16 beginning at a depth of 25 feet to the total depth explored. Samples were collected continuously in boring AS-1 beginning at a depth of 20 feet to the total depth explored. PES screened samples with a photoionization detector (PID) and classified the soil samples for lithology. Soil samples were not collected for laboratory analysis.

Well MW-16 was constructed with nominal 2-inch diameter, flush-threaded Schedule 40 PVC blank casing, a 15-foot length of Schedule 40 PVC screen with 0.020-inch width slots, a 10x20 Colorado silica sand filter pack, and an annular seal of bentonite chips. Well AS-1 was constructed with nominal 1-inch diameter, flush-threaded Schedule 80 PVC blank casing, a 2-foot length of Schedule 80 PVC screen with 0.020-inch width slots, a 10x20 Colorado silica sand filter pack, and an annular seal of bentonite chips. All materials were placed concurrent with auger withdrawal from the boring. Approximately 35 and 75 gallons of clean water were added during the drilling of MW-16 and AS-1, respectively, to prevent heaving.

The surface of each well was completed with an above-grade steel monument, surrounding concrete pad, and three protective bollards filled with sand. All drilling and non-dedicated sampling equipment was decontaminated between each drilling location. The boring logs and well completion diagrams are included in Attachment A.

### Well Development

PES returned to the site to develop the wells on May 20 and 23, 2013. The wells were developed to remove any solids accumulated within the well and filter pack, as well as to remove potable water which was introduced during well installation. Monitoring well MW-16 was developed using a surge and purge technique with a stainless steel bailer and submersible pump. Approximately 40 gallons of water was removed from MW-16, and development continued until the turbidity of the extracted water was below 100 nephelometric turbidity units (NTU). Approximately two inches of sediment was removed from the bottom of the well at the end of development.

Air sparge pilot test well AS-1 was also developed using a surge and purge technique, however the 1-inch Schedule 80 PVC well casing required specialized small diameter tools including a 1-inch diameter Qwater well development tool, a 5/8-inch diameter Waterra foot valve, and

5/8-inch tubing. Development with these tools was difficult and resulted in limited water removal due to small tubing diameter, limited purging capacity per stroke, and the tendency for the foot valve (ball check) to become impacted with fine sediment and allow the accumulated water in the tubing to drain back into the well. As a result, development was stopped after more than four hours of effort, and only 5 gallons of turbid water had been removed from AS-1. The well bottom was gauged following development to verify that no sediment had accumulated during development.

### Lithology

Lithology encountered in monitoring well MW-16 and air sparging pilot test well AS-1 was similar to that encountered during previous investigations with downward coarsening sand, and varying amounts of silt and gravel. Silt was encountered near the base of AS-1 at 46.5 feet bgs, and resulted in a slight change of scope for the well depth as noted above.

### Monitoring Well DC-17 Reconnaissance

PES spent nearly half a day searching for missing monitoring well DC-17. The well was ultimately discovered on May 23, 2013 underneath the northern edge of a large brush pile that is located near the back of the western residential lot on the Harris property. The brush was removed from around the well and an orange traffic cone was used to mark its location.

### Surveying

Horizontal coordinates and vertical elevations were surveyed for monitoring wells MW-16, DC-17, and air sparge pilot test well AS-1 by D.R. Strong Consulting Engineers, Inc. (DRS), a licensed surveyor, on May 28, 2013. The data for the May 28, 2013 survey and the previous survey conducted in February 2013 are included in Attachment B.

### Residuals

Residual water generated during the drilling and well development was placed in drums and stored on-site pending disposal. Soil cuttings were spread out on-site.

## GROUNDWATER MONITORING AND SAMPLING

### Groundwater Level Monitoring

Groundwater level monitoring was conducted on May 28, 2013, in select monitoring wells including MW-2, MW-3, MW-4, MW-7, MW-10 through MW-16, DC-1, DC-4, DC-5, DC-7, DC-8, DC-10A, DC-12 through DC-15, DC-17 through DC-20, KMW-1, KMW-2, and KMW-5. Depth to water was measured from the surveyed top of casing (TOC) to the nearest 0.01 foot using an electronic water level probe.

All of the monitoring wells are screened at the top of the shallow aquifer, but wells DC-5, DC-10B, DC-16, and KMW-5D are screened below and deeper within the shallow aquifer. The

wells are denoted as shallow monitoring wells and deep monitoring wells on the figures and tables.

## Groundwater Sampling

Groundwater samples were collected from May 28 through 31, 2013, using low-flow sampling techniques. Samples were collected from wells MW-2, MW-3, MW-4, MW-10 through MW-16, DC-4, DC-5, DC-7, DC-8, DC-10A, DC-12 through DC-14, DC-17, DC-18, DC-20, and KMW-2. A groundwater sample could not be collected from DC-15 due to a bend or shift in the well casing at a depth of approximately 12 feet below the TOC. A decontaminated Grundfos pump with new tubing was lowered into each well, and the groundwater was purged prior to sample collection until parameters stabilized. Field parameters measured during sampling consisted of temperature, pH, specific conductance, dissolved oxygen (DO), and oxidation reduction potential (ORP). Samples were collected into preserved 40-ml VOA sampling containers and submitted to ESC Lab Sciences (ESC) in Mt. Juliet, TN (a Washington Department of Ecology [Ecology] accredited laboratory) for analysis of Volatile Organic Compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260B.

## Quality Assurance/Quality Control

Equipment blank samples (EQ-1 through EQ-4) were collected at the end of each sampling day following decontamination of the Grundfos pump. The equipment blank samples were collected by pumping de-ionized water through the Grundfos pump and new tubing and into laboratory prepared sample containers. One set of trip blanks was included in the coolers and was returned to the ESC with the second cooler shipment for VOC analysis.

# RESULTS

## Groundwater Monitoring

Water level measurements and groundwater elevations are summarized in Table 1, and field parameter measurements are summarized in Table 2. The depth to water measurements are from the TOC. TOC elevations vary based on whether the well has an above-ground or below-ground completion, and whether the well is located on the Harris Property or on the MVSC Property (with a grade that is 3 feet higher than the Harris Property). The depth to water measurements from wells with below-ground completions located on the Harris Property ranged from approximately 31 to 39 feet below TOC. Groundwater elevations on both properties ranged from 271.94 to 273.53 feet above North American Vertical Datum of 1988 (NAVD 88). Water levels were consistent with historical observations.

## Groundwater Flow Direction

The groundwater elevation contours are presented on Figure 2. As shown on the figure, groundwater flow was to the north. The horizontal groundwater gradient on the Property was

approximately 0.005 feet per foot, with a gradient of approximately 0.02 feet per foot north of the Property, both consistent with historical observations.

## Groundwater Analytical Results

The laboratory analytical results for tetrachloroethene (PCE) are summarized in Table 3 and on Figure 2. The screened intervals for wells with submerged screens (DC-4, DC-5, DC-7, and DC-8) are shaded in blue on Table 3. The depth of water on the day of sampling and the depth of the pump intake are included in Table 3. The results are summarized as follows:

- PCE was not detected at or above the method reporting limit of 1.0 micrograms per liter (µg/L) in shallow monitoring wells MW-12, MW-13, MW-14, MW-15, and in deep monitoring well DC-5;

- PCE was detected in shallow monitoring wells MW-2, MW-3, MW-10, MW-16, DC-12, DC-13, DC-18, and DC-20 at concentrations below Ecology's Model Toxics Control Act (MTCA) Method A cleanup level (5 µg/L);

- PCE was detected above the cleanup level in shallow monitoring wells MW-4, MW-11, DC-4, DC-7, DC-8, DC-10A, DC-14, DC-17, and KMW-2, with concentrations ranging from 6.0 to 22 µg/L; and

- PCE was not detected at or above the method reporting limits in any of the equipment blank and trip blank samples.

A summary of historical groundwater PCE concentration data and the April 2012 PCE isoconcentration map (prepared by ERM) are included in Attachment C for reference.

## Laboratory Data Validation

The laboratory analytical reports were validated in accordance with the USEPA guidelines for organic data review[1]. All of the data were judged to be acceptable for their intended use. Copies of the laboratory analytical reports and data validation memoranda are included in Attachment D.

## CONCLUSIONS AND RECOMMENDATIONS

The May 2013 PCE concentrations were similar to and slightly lower than the April 2012 data. PES will update the time trend plots and historical data tables with the May 2013 data; and this information will be presented in PES's Cleanup Action Plan (CAP). An isoconcentration contour map for the May 2013 PCE data will also be prepared and included in the CAP.

Monitoring well DC-15 will be evaluated prior to the next sampling event to determine the appropriate size of pump that may be reliably deployed and retrieved.

[1] *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*. OSWER 9240.1-05A-P PB99-963506 EPA540/R-99/008, October.

The area with the highest PCE concentrations continues to be the southwest portion of the Harris Property, and concentrations remain elevated along the property line near monitoring wells DC-7, DC-8, and DC-14. Newly installed well MW-16 contained a PCE concentration of 2.5 µg/L; this data will be used in the evaluation of the extent of the PCE plume for the planned air sparge/soil vapor extraction system design.

PES appreciates the opportunity to conduct these well installation and groundwater monitoring activities. If you have any questions regarding this report, or need any additional information, please feel free to contact either of us at (206) 529-3980.

Sincerely,

**PES ENVIRONMENTAL, INC.**

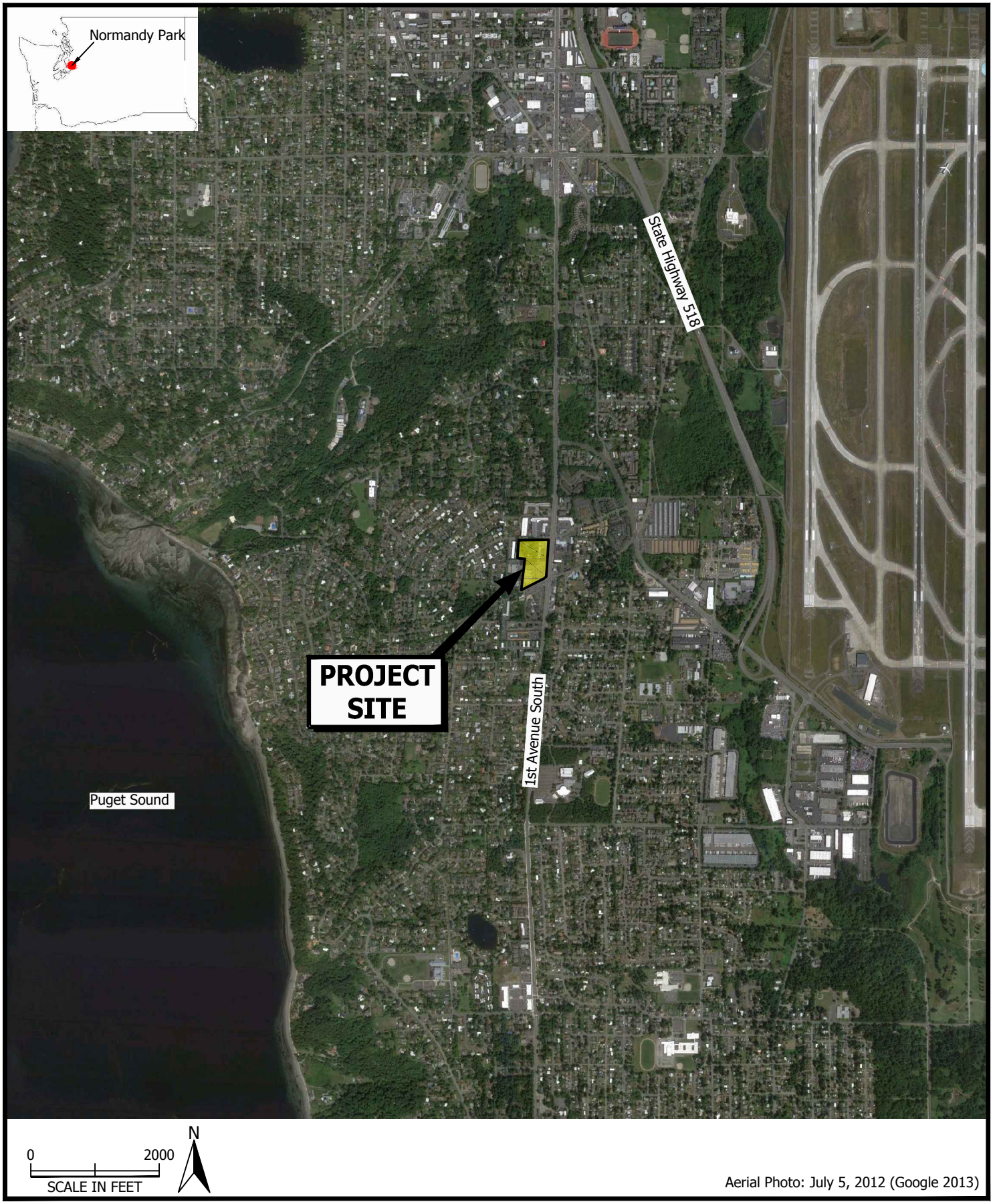
for: Kelly L. Rankich
Project Engineer

Matthew V. Dahl, P.E.
Senior Engineer

William R. Haldeman, LHG
Associate Hydrogeologist

Attachments:

Figure 1 – Site Location Map
Figure 2 – Groundwater Elevations, Contours and PCE Concentrations – May 2013
Table 1 – Summary of Groundwater Elevations
Table 2 – Summary of Groundwater Field Parameters
Table 3 – Summary of Groundwater Analytical Results
Attachment A – Boring Logs and Well Construction Diagrams
Attachment B – Survey Data
Attachment C – Historical Groundwater Data
Attachment D – Laboratory Reports and Data Validation Memoranda




**PES Environmental, Inc.**
Engineering & Environmental Services

**Site Location Map**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

FIGURE
1

| 1358.001.01.003 | 1358-00101003_GW_1-2 | MVD | 6/13 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |

MW-9
SW 176th STREET
RESIDENCES
MW-8
SW 177th STREET
MW-7
(265.28)
MW-6
1st AVE SOUTH
266
267
268
269
270
271
272
273
DUNN LUMBER
DUNN LUMBER
RESIDENCES
WATER SUPPLY WELL
KMW-6
KMW-7
KMW-8
KMW-3
SW 178th STREET
DC-14
(271.84)
6.0
MW-5
DC-7
(271.94)
15
DC-8
(272.01)
11
HARRIS PROPERTY
COMMERCIAL BUILDING
KMW-5D
KMW-5
(271.80)
2nd AVE SW
RESIDENCE
RESIDENCE
MW-14
(272.25)
<1.0
DC-15
(272.28)
KMW-1
(272.51)
DC-20
(272.50)
1.7
VACANT SHED
WELL HOUSE
FORMER SEPTIC TANK
DC-17
(272.51)
21
KMW-4
DC-5
(272.65)
<1.0
DC-16
MW-16
(272.59)
2.5
DC-6
DC-13
(272.59)
1.7
DC-18
(272.59)
4.8
MW-2
(272.83)
2.4
MW-1
DC-12
(272.75)
2.3
DC-10B
MW-10
(272.88)
4.1
DC-9A
DC-9B
AS-1
DC-10A
(272.89)
19
KMW-2
(272.95)
22
MW-11
(272.87)
22
TREATMENT SYSTEM
MW-15
(272.89)
<1.0
FORMER LAUNDROMAT/ DRY CLEANER
CONDOMINIUMS
KMW-9
DC-11
MW-13
(273.08)
<1.0
PARKING LOT
DC-4
(273.06)
11
DC-3
DC-2
RETAINING WALL
DC-19
(273.22)
FORMER DAIRY QUEEN
SECOND BUILDING (VARIOUS SHOPS)
FOUR STAR DRY CLEANERS
MW-4
(273.28)
8.1
DC-1
(273.52)
DAY CARE
MANHATTAN VILLAGE SHOPPING CENTER
MW-3
(273.53)
4.0
MW-12
(273.55)
<1.0
SUSPECTED SEPTIC TANK
QFC BUILDING
N
0
100
SCALE IN FEET

EXPLANATION

- Approximate Property Boundary
- DC-6 Missing or Destroyed Monitoring Well
- DC-9B Abandoned Monitoring Well
- MW-12 Shallow Monitoring Well
- DC-16 Deep Monitoring Well
- AS-1 Air Sparge Well
- (273.52) Groundwater-Level Elevation in feet NAVD 88 on May 28, 2013
- 273 Generalized Groundwater Elevation Contour (dashed where inferred)
- 22 Tetrachloroethene (PCE) concentration in micrograms per liter (ug/L); results in red exceed the MTCA Method A cleanup level
- <1.0 PCE not detected at or above the indicated method reporting limit (MRL)

**PES Environmental, Inc.**
Engineering & Environmental Services

**Groundwater Elevations, Contours, and PCE Concentrations – May 2013**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

FIGURE 2

| 1358.001.01.003 | 1358-00101003_GW_1-2 | MVD | 8/13 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |

# Table 1
## Summary of Groundwater Elevations
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Elevation (feet NAVD 88) | | | Screened Interval (feet) | | Date | Depth to Water (feet TOC) | Groundwater Elevation (feet NAVD 88) |
|---|---|---|---|---|---|---|---|---|
| | Top of Casing (TOC) | Surface Casing Rim | Ground Surface | Below Ground Surface (bgs) | Below Top of Casing | | | |
| **Shallow Monitoring Wells** | | | | | | | | |
| MW-2 | 308.56 | 309.26 | -- | 33-43 | -- | 5/28/2013 | 35.73 | 272.83 |
| MW-3 | 311.62 | 311.92 | -- | 36-46 | -- | 5/28/2013 | 38.09 | 273.53 |
| MW-4 | 310.68 | 311.16 | -- | 34-44 | -- | 5/28/2013 | 37.40 | 273.28 |
| MW-7 | 302.76 | -- | -- | 35-45 | -- | 5/28/2013 | 37.48 | 265.28 |
| MW-10 | 306.91 | 307.33 | -- | 32-42 | -- | 5/28/2013 | 34.03 | 272.88 |
| MW-11 | 307.85 | 308.36 | -- | 32-42 | -- | 5/28/2013 | 34.98 | 272.87 |
| MW-12 | 312.95 | 313.27 | -- | 36-46 | -- | 5/28/2013 | 39.40 | 273.55 |
| MW-13 | 308.90 | 309.28 | -- | 35-45 | -- | 5/28/2013 | 35.82 | 273.08 |
| MW-14 | 303.82 | 304.24 | -- | 28-38 | -- | 5/28/2013 | 31.57 | 272.25 |
| MW-15 | 312.44 | 312.81 | 310.30 | 35-45 | 37.1-47.1 | 5/28/2013 | 39.55 | 272.89 |
| MW-16 | 310.37 | 311.21 | 307.92 | 27.2-42.2 | 29.7-44.7 | 5/28/2013 | 37.78 | 272.59 |
| DC-1 | 312.82 | 313.34 | -- | 40-45 | -- | 5/28/2013 | 39.30 | 273.52 |
| DC-4 | 312.56 | 313.14 | -- | 44-49 | -- | 5/28/2013 | 39.50 | 273.06 |
| DC-7 | 302.88 | 303.45 | -- | 35-40 | -- | 5/28/2013 | 30.94 | 271.94 |
| DC-8 | 306.46 | 306.87 | -- | 37-42 | -- | 5/28/2013 | 34.45 | 272.01 |
| DC-10A | 307.93 | 307.97 | -- | 32-37 | -- | 5/28/2013 | 35.04 | 272.89 |
| DC-12 | 311.25 | 311.58 | -- | 32-42 | -- | 5/28/2013 | 38.50 | 272.75 |
| DC-13 | 310.20 | 310.52 | -- | 32-42 | -- | 5/28/2013 | 37.61 | 272.59 |
| DC-14 | 308.94 | 309.49 | -- | 35-45 | -- | 5/28/2013 | 37.10 | 271.84 |
| DC-15 | 307.89 | 308.20 | -- | 31-41 | -- | 5/28/2013 | 35.61 | 272.28 |
| DC-17 | 305.16 | 305.58 | 305.35 | 30-40 | 29.8-39.8 | 5/28/2013 | 32.65 | 272.51 |
| DC-18 | 309.64 | 310.08 | -- | 32-42 | -- | 5/28/2013 | 37.05 | 272.59 |
| DC-19 | 313.62 | 313.82 | -- | 37-47 | -- | 5/28/2013 | 40.40 | 273.22 |
| DC-20 | 310.92 | 311.13 | -- | 34-44 | -- | 5/28/2013 | 38.42 | 272.50 |
| KMW-1 | 311.59 | 311.82 | -- | 37-52 | -- | 5/28/2013 | 39.08 | 272.51 |
| KMW-2 | 307.25 | 307.40 | -- | 30-40 | -- | 5/28/2013 | 34.30 | 272.95 |
| KMW-5 | 297.10 | -- | -- | 24-34 | -- | 5/28/2013 | 25.30 | 271.80 |
| **Deep Monitoring Wells** | | | | | | | | |
| DC-5 | 306.25 | 306.40 | -- | 41-46 | -- | 5/28/2013 | 33.60 | 272.65 |

NOTES:

1. '-- = not measured or not applicable.
2. Elevations are reported relative to North American Vertical Datum of 1988 (NAVD 88).
3. Top of casing (TOC) elevations were surveyed by D.R. Strong Consulting Engineers, Inc. in February and May 2013 for all wells except MW-7 and KMW-5 (historical TOC elevations used).
4. Screened intervals are documented on boring logs and are typically based on a field measurements relative to ground surface at the time of drilling. Screened intervals relative to top of casing are estimated using field well construction measurements, and surveyed ground surface and top of casing elevations.
5. Shallow monitoring wells are screened at the top of the shallow aquifer, and deep monitoring wells are screened below and deeper within the shallow aquifer.

# Table 2
## Summary of Groundwater Field Parameters
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | Depth to Water (feet TOC) | pH (units) | Specific Conductivity (µS/cm) | Temp (°C) | DO (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|
| **Shallow Monitoring Wells** | | | | | | | |
| MW-2 | 5/30/2013 | 35.71 | 6.40 | 232 | 14.1 | 3.5 | 69 |
| MW-3 | 5/29/2013 | 38.05 | 6.53 | 225 | 14.1 | 3.9 | 57 |
| MW-4 | 5/29/2013 | 37.38 | 6.54 | 328 | 15.6 | 4.7 | 57 |
| MW-10 | 5/29/2013 | 34.04 | 6.60 | 253 | 13.6 | 6.2 | 55 |
| MW-11 | 5/31/2013 | 35.00 | 6.74 | 233 | 14.9 | 4.9 | 68 |
| MW-12 | 5/28/2013 | 39.42 | 6.46 | 241 | 15.7 | 6.7 | 211 |
| MW-13 | 5/30/2013 | 35.83 | 6.43 | 248 | 14.2 | 6.3 | 49 |
| MW-14 | 5/29/2013 | 31.56 | 6.59 | 264 | 14.6 | 5.4 | 50 |
| MW-15 | 5/28/2013 | 39.55 | 6.33 | 77 | 15.6 | 6.7 | 188 |
| MW-16 | 5/31/2013 | 37.75 | 6.58 | 259 | 14.2 | 3.6 | 77 |
| DC-4 | 5/30/2013 | 39.50 | 6.81 | 310 | 17.0 | 2.8 | 50 |
| DC-7 | 5/30/2013 | 30.90 | 6.70 | 270 | 13.6 | 4.3 | 68 |
| DC-8 | 5/30/2013 | 34.44 | 6.36 | 144 | 12.5 | 3.1 | 66 |
| DC-10A | 5/31/2013 | 35.10 | 6.66 | 254 | 15.6 | 4.4 | 91 |
| DC-12 | 5/30/2013 | 38.50 | 6.31 | 246 | 15.9 | 2.8 | 61 |
| DC-13 | 5/30/2013 | 37.60 | 6.32 | 184 | 15.2 | 3.4 | 68 |
| DC-14 | 5/30/2013 | 37.09 | 6.47 | 180 | 14.0 | 3.0 | 55 |
| DC-17 | 5/31/2013 | 32.67 | 6.53 | 202 | 15.8 | 3.6 | 84 |
| DC-18 | 5/30/2013 | 37.05 | 6.40 | 179 | 15.8 | 4.1 | 69 |
| DC-20 | 5/30/2013 | 38.40 | 6.53 | 253 | 16.4 | 1.1 | 40 |
| KMW-2 | 5/31/2013 | 34.38 | 6.56 | 270 | 15.4 | 3.5 | 88 |
| **Deep Monitoring Wells** | | | | | | | |
| DC-5 | 5/29/2013 | 33.59 | 6.62 | 261 | 14.4 | 4.3 | 54 |

NOTES:

1. TOC = top of casing.
2. units: pH standard units reported to 0.01.
3. µS/cm = microsiemens per centimeter @ 25 degrees Celsius (°C).
4. Dissolved Oxygen (DO) reported to 0.1 milligrams per liter (mg/L).
5. ORP = oxidation-reduction potential.
6. mV = millivolts.
7. Shallow monitoring wells are screened at the top of the shallow aquifer, and deep monitoring wells are screened below and deeper within the shallow aquifer.

# Table 3
## Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Screened Interval (feet) Below Ground Surface (bgs) | Screened Interval (feet) Below Top of Casing (TOC) | Pump Intake Depth (feet TOC) | Date | Depth to Water (feet TOC) | PCE (µg/l) | |
|---|---|---|---|---|---|---|---|
| **MTCA Method A Ground Water Cleanup Level** | | | | | | **5** | |
| **Shallow Monitoring Wells** | | | | | | | |
| MW-2 | 33-43 | -- | 38 | 5/30/2013 | 35.71 | **2.4** | |
| MW-3 | 36-46 | -- | 41 | 5/29/2013 | 38.05 | **4.0** | |
| MW-4 | 34-44 | -- | 39 | 5/29/2013 | 37.38 | **8.1** | |
| MW-10 | 32-42 | -- | 37 | 5/29/2013 | 34.04 | **4.1** | |
| MW-11 | 32-42 | -- | 37 | 5/31/2013 | 35.00 | **22** | |
| MW-12 | 36-46 | -- | 42 | 5/28/2013 | 39.42 | 1.0 | U |
| MW-13 | 35-45 | -- | 40 | 5/30/2013 | 35.83 | 1.0 | U |
| MW-14 | 28-38 | -- | NR | 5/29/2013 | 31.56 | 1.0 | U |
| MW-15 | 35-45 | 37.1-47.1 | 42 | 5/28/2013 | 39.55 | 1.0 | U |
| MW-16 | 27-42 | 29.7-44.7 | 39.5 | 5/31/2013 | 37.75 | **2.5** | |
| DC-4 | 44-49 | -- | 49 | 5/30/2013 | 39.50 | **11** | |
| DC-7 | 35-40 | -- | 37.5 | 5/30/2013 | 30.90 | **15** | |
| DC-8 | 37-42 | -- | 40 | 5/30/2013 | 34.44 | **11** | |
| DC-10A | 32-37 | -- | 37 | 5/31/2013 | 35.10 | **19** | |
| DC-12 | 32-42 | -- | 40 | 5/30/2013 | 38.50 | **2.3** | |
| DC-13 | 32-42 | -- | 39 | 5/30/2013 | 37.60 | **1.7** | |
| DC-14 | 35-45 | -- | 40 | 5/30/2013 | 37.09 | **6.0** | |
| DC-17 | 30-40 | 29.8-39.8 | 35 | 5/31/2013 | 32.67 | **21** | |
| DC-18 | 32-42 | -- | 39 | 5/30/2013 | 37.05 | **4.8** | |
| DC-20 | 34-44 | -- | 40 | 5/30/2013 | 38.40 | **1.7** | |
| KMW-2 | 30-40 | -- | 37 | 5/31/2013 | 34.38 | **22** | |
| **Deep Monitoring Wells** | | | | | | | |
| DC-5 | 41-46 | -- | 42.5 | 5/29/2013 | 33.59 | 1.0 | U |

NOTES:

1. Tetrachloroethene (PCE) concentrations in migrograms per liter (µg/l).
2. Groundwater samples analyzed using USEPA Method 8260B.
3. U = concentration not detected at or above the laboratory practical quantitation limit (PQL).
4. Detected concentrations are shown in **bold.**
5. Concentrations exceeding the cleanup level are **bold and shaded**.
6. Screened interval depths are measured in feet below ground surface (bgs) and estimated in feet below top of casing (TOC).
7. Pump intake depth and depth to water is measured in feet below the top of casing (TOC).
8. Screened intervals completely submerged are shaded.
9. Shallow monitoring wells are screened at the top of the shallow aquifer, and deep monitoring wells are screened below and deeper within the shallow aquifer.
10. NR = not recorded. The pump intake depths for MW-14 and DC-4 were not recorded on the field notes, however they are estimated to be 34 feet (MW-14) and 46.5 feet (DC-4) based on memory of the field technician.

# ATTACHMENT A
# BORING LOGS AND WELL CONSTRUCTION DIAGRAMS

PES Environmental, Inc.
Engineering & Environmental Services

# LOG OF MONITORING WELL: MW-16



| Well Completion | Sample ID | PID (ppm) | Blow Count (/6 in.) | Sample Recovery | Sample Interval | Depth (feet) | Graphic Log | Lithologic Description |
|---|---|---|---|---|---|---|---|---|
| Concrete | | | | | | 0 | | BROWN SAND (SP), moist, loose, fine to medium, few fines, trace gravel, trace organics, no odor<br>(boring logged based on auger cuttings to 25 feet bgs) |
| | | 0.0 | | | | 2 | | |
| | | | | | | 4 | | |
| Bentonite | | | | | | | | |
| | | 0.0 | | | | 6 | | |
| | | | | | | 8 | | |
| | | | | | | 10 | | |
| | | 0.0 | | | | 12 | | |
| PVC Blank Casing | | | | | | | | |
| | | | | | | 14 | | |
| | | 0.0 | | | | 16 | | |
| | | | | | | 18 | | |
| | | 0.0 | | | | 20 | | |
| | | | | | | 22 | | |
| | | | | | | 24 | | @ 24.5 feet: drill rig chatter |

Project: Manhattan Village
Project Number: 1358.001.001
Site Location: Normandy Park, Washington
Logged By: Karsten Springstead
Notes: Samples collected with nominal 2" Split Spoon Sampler

Total Drilled Depth: 43 feet
Diameter of Boring: 9 inches
Drill Date: 5/16/13
Drilled By: Holt Services, Inc.
Drill Method: Hollow Stem Auger

PES Environmental, Inc.
Engineering & Environmental Services

# LOG OF MONITORING WELL: MW-16



| Well Completion | Sample ID | PID (ppm) | Blow Count (/6 in.) | Sample Recovery | Sample Interval | Depth (feet) | Graphic Log | Lithologic Description |
|---|---|---|---|---|---|---|---|---|
| PVC Blank Casing | | 0.1 | 11,28,32 | 12 | | 26 | | BROWN GRAY SAND WITH GRAVEL (SP), moist, dense, medium to coarse, few fines, little subrounded gravel |
| | | | | | | 28 | | |
| 10x20 Sand Filter Pack | | 0.1 | 50/6 | 6 | | 30 | | |
| | | | | | | 32 | | |
| PVC Well Screen | | | | | | 34 | | GRAY SAND (SP), wet, dense, medium to coarse, trace fines (below 35 feet bgs, water visible on samples) |
| | | 0.1 | 12,23,30 | 18 | | 36 | | |
| | | | | | | 38 | | |
| | | | | | | 40 | | (added ~35 gallons of water due to heaving sand) |
| | | 0.0 | 22,30,50 | 18 | | 42 | | |
| End Cap | | 0.0 | 50/6 | 6 | | 44 | | Bottom of boring @ 43 feet. |
| | | | | | | 46 | | MONITORING WELL COMPLETION DETAILS:<br>Monitoring well MW-16 constructed with 2-inch Schedule 40 PVC pipe and 0.020-inch machine slotted screen with a flat end cap.<br><br>Total Well Depth (bgs): 42.48 feet.<br>Well Sump/Endcap: 42.23 to 42.48 feet.<br>Well Screen: 27.20 to 42.23 feet.<br>Well Blank:+2.5 to 27.20 feet. Completed 2.5 feet above ground.<br>Filter Pack: 25 to 43 feet (#10-#20 Sand).<br>Well Seal: 2.5 to 25 feet (hydrated bentonite chips).<br>Surface Seal: 0 to 2.5 feet (concrete).<br>Washington Department of Ecology Well Tag Number: BHV646. |
| | | | | | | 48 | | |
| | | | | | | 50 | | |

Project: Manhattan Village
Project Number: 1358.001.001
Site Location: Normandy Park, Washington
Logged By: Karsten Springstead
Notes: Samples collected with nominal 2" Split Spoon Sampler

Total Drilled Depth: 43 feet
Diameter of Boring: 9 inches
Drill Date: 5/16/13
Drilled By: Holt Services, Inc.
Drill Method: Hollow Stem Auger

PES Environmental, Inc.
Engineering & Environmental Services

# LOG OF MONITORING WELL: AS-1



| Well Completion | Sample ID | PID (ppm) | Blow Count (/6 in.) | Sample Recovery | Sample Interval | Depth (feet) | Graphic Log | Lithologic Description |
|---|---|---|---|---|---|---|---|---|
| Conrete; Bentonite; PVC Blank Casing 1" SCH 80 | | | | | | 0 | | BROWN SILTY SAND (SM), moist, loose, fine to coarse, trace subrounded gravel, trace roots |
| | | | | | | 2 | | (boring logged based on auger cuttings to 20 feet bgs) |
| | | | | | | 4 | | |
| | | | | | | 6 | | |
| | | | | | | 8 | | |
| | | | | | | 10 | | |
| | | | | | | 12 | | |
| | | | | | | 14 | | |
| | | | | | | 16 | | |
| | | | | | | 18 | | |
| | | | | | | 20 | | |
| | | 1.0 | 12,6,9 | 12 | | 22 | | GRAY BROWN SILTY SAND (SM), little fines, few gravel |
| | | 0.8 | 5,6,9 | 12 | | 24 | | GRAY SAND (SP), moist, fine to medium, trace fines |
| | | 0.9 | 10,24,22 | 12 | | 26 | | @ 24.5 feet: few fines |
| | | 0.4 | 11,34,36 | 12 | | 28 | | @ 26 feet: fine to coarse, little fines |
| | | 3.7 | 16,33,36 | 12 | | 30 | | GRAY SILTY SAND (SM), moist, fine to medium, little fines, little subrounded gravel |
| | | 0.4 | 7,15,19 | 12 | | | | GRAY SAND (SP), moist, fine to medium, trace fines |
| | | 0.1 | 19,19,30/5 | 18 | | | | |

Project: Manhattan Village
Project Number: 1358.001.001
Site Location: Normandy Park, Washington
Logged By: Karsten Springstead
Notes: Samples collected with nominal 2" Split Spoon Sampler

Total Drilled Depth: 48 feet
Diameter of Boring: 9 inches
Drill Date: 5/16/13 and 5/17/13
Drilled By: Holt Services, Inc.
Drill Method: Hollow Stem Auger

PES Environmental, Inc.
Engineering & Environmental Services

# LOG OF MONITORING WELL: AS-1



| Well Completion | Sample ID | PID (ppm) | Blow Count (/6 in.) | Sample Recovery | Sample Interval | Depth (feet) | Graphic Log | Lithologic Description |
|---|---|---|---|---|---|---|---|---|
| Bentonite | | 0.1 | 15,45,48 | 12 | | 30 | | @ 30 feet: fine to coarse, little subrounded gravel |
| | | 0.1 | 7,28,27 | 18 | | 32 | | @ 31.5 feet: rust/orange mottling<br>@ 32 feet: wet |
| PVC Blank Casing 1" SCH 80 | | 0.1 | 7,20,23 | 12 | | 34 | | @ 34 feet: few gravel |
| | | 0.1 | 14,27,26 | 18 | | 36 | | @ 36 feet: little gravel<br>@ 36.5 feet: dark brown silt lens (dry, hard) |
| | | 0.2 | 10,20,25 | 12 | | 38 | | @ 37 feet: occasional 1" brown fine lenses |
| | | 0.2 | 9,26,38 | 18 | | 40 | | |
| | | 0.4 | 28,41,43 | 12 | | 42 | | Stopped Drilling on 5/16/13. Added ~75 gallons of water to prevent heaving.<br>Continued drilling on 5/17/13<br>@ 41 to 42 feet: sample lost |
| | | 0.4 | 50/5 | 6 | | | | GRAY SILTY SAND (SM), wet, fine to coarse, little fines, few subrounded gravel (driller notes odor in auger.) |
| 10x20 Sand Filter Pack | | 0.4 | 43,50/5 | 12 | | 44 | | |
| | | 0.4 | 35,50/5 | 12 | | 46 | | GRAY SILTY GRAVEL WITH SAND (GP), wet, fine to coarse, little fines, subrounded gravel, little to some sand |
| PVC Well Screen | | 0.0 | 11,12,18 | 18 | | 48 | | BROWN SILT (ML), moist, dense, few fine sand, orange mottling, medium plasticity |
| End Cap | | | | | | | | @ 48 feet: Bottom of Boring |
| | | | | | | 50 | | AIR SPARGE WELL COMPLETION DETAILS:<br>Air sparge well constructed with 1-inch Schedule 80 PVC pipe and 0.020-inch machine slotted screen with a flat end plug. |
| | | | | | | 52 | | AS-1<br>Total Well Depth: 45.80 feet.<br>Well Sump/Endcap: 45.80 to 45.83feet.<br>Well Screen: 43.80 to 45.80 feet.<br>Well Blank:+3.0 to 43.80 feet. Completed 3.0 feet above ground.<br>Filter Pack: 43.5 to 48 feet (#10-#20 Sand).<br>Well Seal: 2.5 to 43.5 feet (hydrated bentonite chips).<br>Surface Seal: 0 to 2.5 feet (concrete).<br>Washington Department of Ecology Well Tag Number: BHV647. |
| | | | | | | 54 | | |
| | | | | | | 56 | | |
| | | | | | | 58 | | |
| | | | | | | 60 | | |

Project: Manhattan Village
Project Number: 1358.001.001
Site Location: Normandy Park, Washington
Logged By: Karsten Springstead
Notes: Samples collected with nominal 2" Split Spoon Sampler

Total Drilled Depth: 48 feet
Diameter of Boring: 9 inches
Drill Date: 5/16/13 and 5/17/13
Drilled By: Holt Services, Inc.
Drill Method: Hollow Stem Auger

# ATTACHMENT B
# SURVEY DATA

# Well Location Details
## May 2013
## Normandy Park , WA

| | Northing | Easting | Monitoring Point Elevation (Top of PVC NorthSide)b | Surface Casing Metal Rim Elevation (NorthSide)[b] | Ground Surface Elevation (NorthSide)[b] | Topographic Point Elevation | Topographic Point Description |
|---|---|---|---|---|---|---|---|
| DC-17 | 165,194.19 | 1,268,528.58 | 305.16 | 305.58 | 305.35 | | |
| MW-16 | 165,164.48 | 1,268,613.27 | 310.37 | 311.21 | 307.92 | | |
| AS-1 | 165,117.17 | 1,268,510.88 | 310.59 | 310.64 | 307.34 | | |

**Notes:** 1. Northing/Easting relative to the WA State Plane System North Zone (NAD 83); based on based on Washongton State DOT Survey Control: GP17509-167 Monument ID: 2655, and Washongton State DOT Survey Control: GP17509-166, Monument ID: 2654.

2. Elevations in feet relative to the North American Vertical Datum (NAVD) of 1988; based on Washongton State DOT Survey Control: GP17509-167 as Monument ID: 2655 (elevation 307.88 ft), benchmark is a WSDOT brass disk set in concrete curb.

3. Monitoring point = top of well casing

DRS Project No. 13019

# Well Location Details
## February 2013
## Normandy Park , WA

| | Northing | Easting | Monitoring Point Elevation (Top of PVC NorthSide)b | Surface Casing Metal Rim Elevation (NorthSide)[b] | Ground Surface Elevation (NorthSide)[b] | Topographic Point Elevation | Topographic Point Description |
|---|---|---|---|---|---|---|---|
| DC-1 | 164,940.21 | 1,268,698.62 | 312.82 | 313.34 | | | |
| DC-2 | 165,055.59 | 1,268,655.14 | 313.13 | 313.70 | | | |
| DC-3 | 165,056.38 | 1,268,607.75 | 313.35 | 313.76 | | | |
| DC-4 | 165,058.09 | 1,268,537.42 | 312.56 | 313.14 | | | |
| DC-6 | | | N/A | N/A | | | |
| DC-7 | 165,318.10 | 1,268,514.41 | 302.88 | 303.45 | | | |
| DC-8 | 165,328.83 | 1,268,685.36 | 306.46 | 306.87 | | | |
| DC-10A | 165,117.20 | 1,268,497.22 | 307.93 | 307.97 | | | |
| DC-10B | 165,120.42 | 1,268,497.52 | 307.99 | 308.38 | | | |
| DC-11 | 165,078.54 | 1,268,816.09 | 311.25 | 311.66 | | | |
| DC-12 | 165,179.40 | 1,268,851.90 | 311.25 | 311.58 | | | |
| DC-13 | 165,208.90 | 1,268,827.17 | 310.20 | 310.52 | | | |
| DC-14 | 165,355.00 | 1,268,812.64 | 308.94 | 309.49 | | | |
| DC-15 | 165,267.13 | 1,268,705.91 | 307.89 | 308.20 | | | |
| DC-16 | 165,169.72 | 1,268,611.50 | N/A | 307.79 | | | |
| DC-17 | 165,166.48 | 1,268,526.89 | 306.25 | 306.40 | | | |
| DC-18 | 165,197.14 | 1,268,764.98 | 309.64 | 310.08 | | | |
| DC-19 | 165,039.32 | 1,268,829.60 | 313.62 | 313.82 | | | |
| DC-20 | 165237.18 | 1268854.76 | 310.92 | 311.13 | | | |
| | | | | | | | |
| KMW-1 | 165245.88 | 1268892.64 | 311.59 | 311.82 | | | |
| KMW-2 | 165,111.71 | 1,268,530.99 | 307.25 | 307.40 | | | |
| KMW-9 | 165,078.99 | 1,268,726.35 | 310.53 | 310.94 | | | |
| | | | | | | | |
| MW-1 | | | N/A | N/A | | | |
| MW-2 | 165149.83 | 1268724.65 | 308.56 | 309.26 | | | |
| MW-3 | 164857.15 | 1268511.48 | 311.62 | 311.92 | | | |
| MW-4 | 164968.53 | 1268493.55 | 310.68 | 311.16 | | | |
| MW-5 | 165331.57 | 1268938.60 | 310.38 | 310.84 | | | |
| MW-10 | 165132.29 | 1268522.81 | 306.91 | 307.33 | | | |
| MW-11 | 165122.22 | 1268582.85 | 307.85 | 308.36 | | | |
| MW-12 | 164824.99 | 1268516.13 | 312.95 | 313.27 | | | |
| MW-13 | 165036.46 | 1268459.84 | 308.90 | 309.28 | | | |
| MW-14 | 165261.07 | 1268564.61 | 303.82 | 304.24 | | | |
| MW-15 | 165103.88 | 1268678.67 | 312.44 | 312.81 | 310.30 | | |
| | | | | | | | |
| | | | | | | | |
| SVE-1 | 164943.49 | 1268516.22 | 311.85 | 312.12 | | | |
| SVE-2 | 165000.43 | 1268521.85 | 312.41 | 312.76 | | | |
| SVE-3 | 165070.20 | 1268536.38 | 308.28 | | 307.84 | | |
| SVE-4 | 165069.15 | 1268589.21 | 308.90 | | 308.31 | | |
| SVE-5 | 165068.80 | 1268655.33 | 309.91 | | 309.31 | | |
| SVE-6 | 165057.46 | 1268693.44 | 313.03 | 313.57 | | | |
| SVE-7 | 165077.54 | 1268704.58 | 310.71 | | 309.95 | | |
| SVE-8 | 165085.81 | 1268738.29 | 311.48 | | 310.56 | | |
| SVE-9 | 165059.97 | 1268819.49 | 313.31 | | 312.13 | | |
| SVE-10 | 165187.12 | 1268839.77 | 311.06 | 311.28 | | | |
| | | | | | | | |
| VMP-1 | 164828.10 | 1268482.37 | 310.91 | 311.18 | | | |
| VMP-2 | 164964.75 | 1268493.99 | 310.97 | 311.19 | | | |
| VMP-3 | 165028.42 | 1268497.62 | 310.58 | 310.71 | | | |
| VMP-4 | 165079.04 | 1268533.80 | 307.67 | 308.00 | | | |
| VMP-5 | 165083.74 | 1268602.84 | 308.22 | 308.48 | | | |
| VMP-6 | 165071.18 | 1268674.91 | 308.95 | 309.18 | | | |
| | | | | | | | |
| TW-1 | 165114.77 | 1268571.32 | N/A | N/A | | | |
| | | | | | | | |
| | 165313.52 | 1268873.13 | | | | 318.98 | NE Corner Commercial Bldg |
| | 165263.35 | 1268872.69 | | | | 318.98 | SE Corner Commercial Bldg |
| | | | | | | | |
| | 165218.48 | 1268874.03 | | | | 317.30 | NW Corner Dry-Cleaner Bldg |
| | 165077.48 | 1268898.31 | | | | 319.43 | SE Corner Dry-Cleaner Bldg |
| | | | | | | | |
| | 165200.60 | 1268814.85 | | | | 310.09 | Fence, north end, west of dry-cleaner bldg |
| | 165062.91 | 1268783.78 | | | | 311.17 | Fence, south end, west of dry-cleaner bldg |
| | | | | | | | |
| | 165103.91 | 1268708.95 | | | | 310.42 | Fence NE corner, near MW-15 |
| | 165093.68 | 1268708.55 | | | | 310.42 | Fence SE corner, near MW-15 |
| | 165093.71 | 1268688.02 | | | | 310.22 | Fence SW corner, near MW-15 |
| | | | | | | | |
| | 165053.67 | 1268626.16 | | | | 313.86 | Sanitary Sewer Clean-Out, east of DC-3 |
| | 165053.11 | 1268691.64 | | | | 313.60 | Sanitary Sewer Clean-Out, south of SVE-6 |
| | 165052.38 | 1268748.01 | | | | 313.88 | Sanitary Sewer Clean-Out, east of SVE-6 |
| | | | | | | | |

**Notes:** 1. Northing/Easting relative to the WA State Plane System North Zone (NAD 83); based on based on Washongton State DOT Survey Control: GP17509-167 Monument ID: 2655, and Washongton State DOT Survey Control: GP17509-166, Monument ID: 2654.

2. Elevations in feet relative to the North American Vertical Datum (NAVD) of 1988; based on Washongton State DOT Survey Control: GP17509-167 as Monument ID: 2655 (elevation 307.88 ft), benchmark is a WSDOT brass disk set in concrete curb.

3. Monitoring point = top of well casing

DRS Project No. 13019

# ATTACHMENT C
# HISTORICAL GROUNDWATER DATA

# Table C-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| **Shallow Monitoring Wells** | | | |
| MW-01 | 12/10/1999 | **22** | |
| MW-01 | 4/11/2006 | **14** | |
| MW-01 | 10/26/2006 | **11** | |
| MW-01 | 4/25/2007 | **13** | |
| | | | |
| MW-02 | 12/10/1999 | **17** | |
| MW-02 | 4/5/2012 | **7.1** | |
| MW-02 | 5/30/2013 | **2.4** | |
| | | | |
| MW-03 | 4/14/2008 | **2.3** | |
| MW-03 | 11/1/2010 | **2.9** | |
| MW-03 | 5/31/2011 | 2.0 | U |
| MW-03 | 7/20/2011 | 2.0 | U |
| MW-03 | 10/18/2011 | **6.1** | |
| MW-03 | 4/4/2012 | **5.8** | |
| MW-03 | 5/29/2013 | **4.0** | |
| | | | |
| MW-04 | 4/14/2008 | **33** | |
| MW-04 | 3/9/2010 | **7.8** | |
| MW-04 | 11/1/2010 | **16** | |
| MW-04 | 5/31/2011 | **10** | |
| MW-04 | 7/21/2011 | **25** | |
| MW-04 | 10/19/2011 | **21** | |
| MW-04 | 4/4/2012 | **11** | |
| MW-04 | 5/29/2013 | **8.1** | |
| | | | |
| MW-05 | 4/11/2008 | **0.50** | |
| MW-05 | 4/2/2012 | 2.0 | U |
| | | | |
| MW-06 | 4/15/2008 | 2.0 | U |
| MW-06 | 4/2/2012 | 2.0 | U |
| | | | |
| MW-07 | 4/16/2008 | **22** | |
| MW-07 | 4/2/2012 | **14** | |
| | | | |
| MW-08 | 8/21/2008 | **0.20** | J |
| MW-08 | 4/2/2012 | 2.0 | U |
| | | | |
| MW-09 | 8/21/2008 | **0.10** | J |
| MW-09 | 4/2/2012 | 2.0 | U |
| | | | |
| MW-10 | 2/8/2011 | **10** | |
| MW-10 | 5/31/2011 | 2.0 | U |
| MW-10 | 7/20/2011 | **4.1** | |
| MW-10 | 10/18/2011 | **4.9** | |
| MW-10 | 4/6/2012 | **6.7** | |
| MW-10 | 5/29/2013 | **4.1** | |
| | | | |

# Table C-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| MW-11 | 2/8/2011 | **47** | |
| MW-11 | 5/31/2011 | 2.0 | U |
| MW-11 | 7/20/2011 | 2.0 | U |
| MW-11 | 10/18/2011 | 2.0 | U |
| MW-11 | 4/6/2012 | **29** | |
| MW-11 | 5/31/2013 | **22** | |
| | | | |
| MW-12 | 4/4/2012 | 2.0 | U |
| MW-12 | 5/28/2013 | 1.0 | U |
| | | | |
| MW-13 | 4/3/2012 | 2.0 | U |
| MW-13 | 5/30/2013 | 1.0 | U |
| | | | |
| MW-14 | 4/5/2012 | 2.0 | U |
| MW-14 | 5/29/2013 | 1.0 | U |
| | | | |
| MW-15 | 4/5/2012 | 2.0 | U |
| MW-15 | 5/28/2013 | 1.0 | U |
| | | | |
| MW-16 | 5/31/2013 | 1.0 | U |
| | | | |
| DC-01 | 10/21/1998 | **0.60** | |
| DC-01 | 2/3/1999 | 0.5 | U |
| DC-01 | 4/7/1999 | 0.5 | U |
| DC-01 | 12/8/1999 | 1.0 | U |
| DC-01 | 4/26/2000 | 1.0 | U |
| DC-01 | 8/3/2000 | 1.0 | U |
| DC-01 | 11/14/2000 | 1.0 | U |
| DC-01 | 3/6/2001 | 1.0 | U |
| DC-01 | 6/20/2001 | 1.0 | U |
| DC-01 | 9/17/2001 | 1.0 | U |
| DC-01 | 12/20/2001 | 1.0 | U |
| DC-01 | 3/13/2002 | 1.0 | U |
| DC-01 | 9/17/2002 | 1.0 | U |
| DC-01 | 12/10/2002 | 1.0 | U |
| DC-01 | 3/31/2003 | 1.0 | U |
| DC-01 | 9/3/2003 | 1.0 | U |
| DC-01 | 3/16/2004 | 1.0 | U |
| DC-01 | 9/7/2004 | 1.0 | U |
| DC-01 | 4/25/2007 | 0.2 | U |
| DC-01 | 4/4/2012 | 2.0 | U |
| | | | |
| DC-02 | 10/21/1998 | **2.4** | |
| DC-02 | 2/3/1999 | **0.70** | |
| DC-02 | 4/7/1999 | 0.5 | U |
| DC-02 | 12/8/1999 | 0.5 | U |
| DC-02 | 4/26/2000 | 1.0 | U |
| DC-02 | 8/3/2000 | 1.0 | U |
| DC-02 | 11/14/2000 | 1.0 | U |

# Table C-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| DC-02 | 3/6/2001 | 1.0 | U |
| DC-02 | 6/20/2001 | 1.0 | U |
| DC-02 | 9/17/2001 | 1.0 | U |
| DC-02 | 12/20/2001 | 1.0 | U |
| DC-02 | 3/13/2002 | **4.0** | |
| DC-02 | 6/13/2002 | 1.0 | U |
| DC-02 | 9/17/2002 | 1.0 | U |
| DC-02 | 12/10/2002 | **0.50** | |
| DC-02 | 3/31/2003 | **3.4** | |
| DC-02 | 9/3/2003 | 1.0 | U |
| DC-02 | 3/16/2004 | **0.74** | |
| DC-02 | 9/7/2004 | 1.0 | U |
| DC-02 | 4/26/2007 | **1.2** | |
| DC-02 | 4/14/2008 | **0.30** | |
| DC-02 | 11/3/2010 | 2.0 | U |
| DC-02 | 5/31/2011 | 2.0 | U |
| DC-02 | 7/21/2011 | 2.0 | U |
| DC-02 | 10/18/2011 | 2.0 | U |
| DC-02 | 4/4/2012 | 2.0 | U |
| | | | |
| DC-03 | 10/28/1998 | **54** | |
| DC-03 | 2/4/1999 | **25** | |
| DC-03 | 4/8/1999 | **36** | |
| DC-03 | 12/8/1999 | **45** | |
| DC-03 | 4/26/2000 | **56** | |
| DC-03 | 8/3/2000 | **25** | |
| DC-03 | 11/14/2000 | 1.0 | U |
| DC-03 | 3/6/2001 | **4.7** | |
| DC-03 | 6/20/2001 | **2.8** | |
| DC-03 | 9/17/2001 | 1.0 | U |
| DC-03 | 12/20/2001 | **9.2** | |
| DC-03 | 3/13/2002 | **40** | |
| DC-03 | 6/13/2002 | **42** | |
| DC-03 | 9/17/2002 | **33** | |
| DC-03 | 12/10/2002 | **5.4** | |
| DC-03 | 3/31/2003 | **7.3** | |
| DC-03 | 9/3/2003 | **2.1** | |
| DC-03 | 3/16/2004 | 1.0 | U |
| DC-03 | 9/7/2004 | **3.4** | |
| DC-03 | 4/26/2007 | **42** | |
| DC-03 | 4/14/2008 | **28** | |
| DC-03 | 3/9/2010 | 2.0 | U |
| DC-03 | 11/3/2010 | 2.0 | U |
| DC-03 | 5/30/2011 | **3.9** | |
| DC-03 | 7/20/2011 | **12** | |
| DC-03 | 10/18/2011 | **6.7** | |
| DC-03 | 4/4/2012 | **2.9** | |
| | | | |

# Table C-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| DC-04 | 10/28/1998 | **227** | |
| DC-04 | 2/4/1999 | **144** | |
| DC-04 | 4/8/1999 | **110** | |
| DC-04 | 12/8/1999 | **71** | |
| DC-04 | 4/26/2000 | **120** | |
| DC-04 | 8/3/2000 | **42** | |
| DC-04 | 11/14/2000 | **64** | |
| DC-04 | 3/6/2001 | **52** | |
| DC-04 | 6/20/2001 | **40** | |
| DC-04 | 9/17/2001 | **23** | |
| DC-04 | 12/20/2001 | **15** | |
| DC-04 | 3/13/2002 | **55** | |
| DC-04 | 6/13/2002 | **18** | |
| DC-04 | 9/17/2002 | **29** | |
| DC-04 | 12/10/2002 | **22** | |
| DC-04 | 3/31/2003 | **13** | |
| DC-04 | 9/3/2003 | **14** | |
| DC-04 | 3/16/2004 | **20** | |
| DC-04 | 9/7/2004 | **19** | |
| DC-04 | 4/26/2007 | **19** | |
| DC-04 | 4/11/2008 | **30** | |
| DC-04 | 3/9/2010 | **9.2** | |
| DC-04 | 11/3/2010 | **13** | |
| DC-04 | 5/31/2011 | 2.0 | U |
| DC-04 | 7/20/2011 | 2.0 | U |
| DC-04 | 10/18/2011 | **22** | |
| DC-04 | 4/4/2012 | **22** | |
| DC-04 | 5/30/2013 | **11** | |
| | | | |
| DC-06 | 2/4/1999 | **5.1** | |
| DC-06 | 4/8/1999 | **3.7** | |
| | | | |
| DC-07 | 2/4/1999 | **74** | |
| DC-07 | 4/8/1999 | **64** | |
| DC-07 | 12/8/1999 | **107** | |
| DC-07 | 4/26/2000 | **130** | |
| DC-07 | 8/3/2000 | **50** | |
| DC-07 | 11/14/2000 | **130** | |
| DC-07 | 3/6/2001 | **140** | |
| DC-07 | 6/20/2001 | **96** | |
| DC-07 | 9/17/2001 | **81** | |
| DC-07 | 12/20/2001 | **47** | |
| DC-07 | 3/13/2002 | **31** | |
| DC-07 | 6/13/2002 | **42** | |
| DC-07 | 9/17/2002 | **78** | |
| DC-07 | 12/10/2002 | **92** | |
| DC-07 | 3/31/2003 | **40** | |
| DC-07 | 9/3/2003 | **57** | |
| DC-07 | 4/11/2006 | **23** | |

# Table C-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) |
|---|---|---|
| DC-07 | 10/26/2006 | **51** |
| DC-07 | 4/24/2007 | **27** |
| DC-07 | 4/16/2010 | **51** |
| DC-07 | 11/3/2010 | **34** |
| DC-07 | 6/1/2011 | **15** |
| DC-07 | 7/21/2011 | **38** |
| DC-07 | 10/18/2011 | **42** |
| DC-07 | 4/5/2012 | **18** |
| DC-07 | 5/30/2013 | **15** |
| | | |
| DC-08 | 2/4/1999 | **56** |
| DC-08 | 4/8/1999 | **48** |
| DC-08 | 12/8/1999 | **98** |
| DC-08 | 4/26/2000 | **87** |
| DC-08 | 8/3/2000 | **70** |
| DC-08 | 11/14/2000 | **130** |
| DC-08 | 3/6/2001 | **82** |
| DC-08 | 6/20/2001 | **80** |
| DC-08 | 9/17/2001 | **62** |
| DC-08 | 12/20/2001 | **50** |
| DC-08 | 3/13/2002 | **31** |
| DC-08 | 6/13/2002 | **27** |
| DC-08 | 9/17/2002 | **38** |
| DC-08 | 12/10/2002 | **53** |
| DC-08 | 3/31/2003 | **36** |
| DC-08 | 9/3/2003 | **35** |
| DC-08 | 4/11/2006 | **14** |
| DC-08 | 10/26/2006 | **28** |
| DC-08 | 4/24/2007 | **24** |
| DC-08 | 4/16/2010 | **39** |
| DC-08 | 11/3/2010 | **25** |
| DC-08 | 6/1/2011 | **11** |
| DC-08 | 7/21/2011 | **25** |
| DC-08 | 10/19/2011 | **26** |
| DC-08 | 4/5/2012 | **18** |
| DC-08 | 5/30/2013 | **11** |
| | | |
| DC-09A | 4/8/1999 | **135** |
| DC-09A | 12/8/1999 | **73** |
| DC-09A | 4/26/2000 | **240** |
| DC-09A | 8/3/2000 | **110** |
| DC-09A | 4/11/2006 | **78** |
| DC-09A | 8/8/2006 | **49** |
| DC-09A | 11/2/2006 | 2.9 |
| DC-09A | 4/26/2007 | **33** |
| | | |

# Table C-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| DC-10A | 4/8/1999 | **150** | |
| DC-10A | 12/8/1999 | **73** | |
| DC-10A | 4/26/2000 | **210** | |
| DC-10A | 4/5/2012 | **41** | |
| DC-10A | 5/31/2013 | **19** | |
| | | | |
| DC-11 | 4/26/2007 | **12** | |
| DC-11 | 3/9/2010 | **4.6** | |
| DC-11 | 11/1/2010 | **4.8** | |
| DC-11 | 4/4/2012 | **3.1** | |
| | | | |
| DC -12 | 4/25/2007 | **16** | |
| DC-12 | 4/4/2012 | **3.7** | |
| DC-12 | 5/30/2013 | **2.3** | |
| | | | |
| DC-13 | 4/25/2007 | **15** | |
| DC-13 | 4/16/2008 | **23** | |
| DC-13 | 3/1/2010 | **10** | |
| DC-13 | 11/2/2010 | **9.2** | |
| DC-13 | 4/5/2012 | **6.4** | |
| DC-13 | 5/30/2013 | **1.7** | |
| | | | |
| DC-14 | 4/25/2007 | **11** | |
| DC-14 | 4/3/2012 | **11** | |
| DC-14 | 5/30/2013 | **6.0** | |
| | | | |
| DC-15 | 4/24/2007 | **11** | |
| DC-15 | 4/5/2012 | **20** | |
| | | | |
| DC-16 | 4/25/2007 | **0.42** | |
| DC-16 | 11/5/2010 | 2.0 | U |
| DC-16 | 5/31/2011 | 2.0 | U |
| DC-16 | 7/19/2011 | 2.0 | U |
| DC-16 | 10/18/2011 | 2.0 | U |
| DC-16 | 4/6/2012 | 2.0 | U |
| | | | |
| DC-17 | 4/25/2007 | **47** | |
| DC-17 | 4/16/2008 | **75** | |
| DC-17 | 5/31/2013 | **21** | |
| | | | |
| DC-18 | 4/25/2007 | **19** | |
| DC-18 | 4/5/2012 | **7.2** | |
| DC-18 | 5/30/2013 | **4.8** | |
| | | | |
| DC-19 | 6/4/2007 | **0.79** | |
| DC-19 | 4/14/2008 | **0.70** | |
| DC-19 | 4/4/2012 | 2.0 | U |
| | | | |

# Table C-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| DC-20 | 5/30/2013 | **1.7** | |
| | | | |
| KMW-01 | 4/11/2006 | 1.0 | U |
| KMW-01 | 10/26/2006 | 1.0 | U |
| KMW-01 | 4/25/2007 | 0.2 | U |
| KMW-01 | 4/14/2008 | 0.2 | U |
| KMW-01 | 4/3/2012 | 2.0 | U |
| | | | |
| KMW-02 | 6/12/2006 | **130** | |
| KMW-02 | 8/8/2006 | **130** | |
| KMW-02 | 10/26/2006 | **190** | |
| KMW-02 | 4/24/2007 | **63** | |
| KMW-02 | 4/16/2008 | **96** | |
| KMW-02 | 3/8/2010 | **81** | |
| KMW-02 | 11/3/2010 | **74** | |
| KMW-02 | 6/1/2011 | **12** | |
| KMW-02 | 7/20/2011 | **44** | |
| KMW-02 | 10/19/2011 | **40** | |
| KMW-02 | 4/6/2012 | **25** | |
| KMW-02 | 5/31/2013 | **22** | |
| | | | |
| KMW-03 | 6/12/2006 | **20** | |
| KMW-03 | 10/26/2006 | **13** | |
| KMW-03 | 4/24/2007 | **9.9** | |
| KMW-03 | 11/2/2010 | **11** | |
| KMW-03 | 5/31/2011 | **6.2** | |
| KMW-03 | 7/20/2011 | **12** | |
| KMW-03 | 10/18/2011 | **11** | |
| KMW-03 | 4/3/2012 | **6.8** | |
| | | | |
| KMW-04 | 4/25/2007 | **0.73** | |
| KMW-04 | 4/3/2012 | 2.0 | U |
| | | | |
| KMW-05 | 4/25/2007 | **0.82** | |
| KMW-05 | 4/3/2012 | 2.0 | U |
| | | | |
| KMW-06 | 4/24/2007 | **3.8** | |
| KMW-06 | 4/3/2012 | 2.0 | U |
| | | | |
| KMW-07 | 4/24/2007 | **3.8** | |
| KMW-07 | 4/15/2008 | **3.9** | |
| KMW-07 | 11/3/2010 | 2.0 | U |
| KMW-07 | 5/30/2011 | **2.3** | |
| KMW-07 | 7/20/2011 | 2.0 | U |
| KMW-07 | 10/18/2011 | 2.0 | U |
| KMW-07 | 4/3/2012 | **3.3** | |
| | | | |

# Table C-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| KMW-08 | 4/24/2007 | **11** | |
| KMW-08 | 4/15/2008 | **17** | |
| KMW-08 | 4/3/2012 | **10** | |
| | | | |
| KMW-09 | 4/26/2007 | **9.3** | |
| KMW-09 | 3/8/2010 | **4.4** | |
| KMW-09 | 11/4/2010 | **2.8** | |
| KMW-09 | 4/5/2012 | **4.0** | |
| | | | |
| **Deep Monitoring Wells** | | | |
| DC-05 | 2/4/1999 | **2.4** | |
| DC-05 | 4/8/1999 | **1.6** | |
| DC-05 | 4/11/2006 | **1.3** | |
| DC-05 | 4/26/2007 | **2.1** | |
| DC-05 | 11/3/2010 | **2.1** | |
| DC-05 | 5/30/2011 | 2.0 | U |
| DC-05 | 7/19/2011 | 2.0 | U |
| DC-05 | 10/18/2011 | 2.0 | U |
| DC-05 | 4/6/2012 | 2.0 | U |
| DC-05 | 5/29/2013 | 1.0 | U |
| | | | |
| DC-09B | 4/8/1999 | **1.4** | |
| DC-09B | 3/6/2001 | **2.0** | |
| DC-09B | 6/20/2001 | 1.0 | U |
| DC-09B | 9/17/2001 | 1.0 | U |
| DC-09B | 12/20/2001 | **6.4** | |
| DC-09B | 4/11/2006 | 1.0 | U |
| DC-09B | 8/8/2006 | 1.0 | U |
| DC-09B | 10/26/2006 | 1.0 | U |
| DC-09B | 4/26/2007 | 0.2 | U |
| DC-09B | 4/15/2008 | **0.60** | |
| | | | |
| DC-10B | 4/8/1999 | **1.8** | |
| DC-10B | 3/6/2001 | **3.3** | |
| DC-10B | 6/20/2001 | **2.4** | |
| DC-10B | 9/17/2001 | 1.0 | U |
| DC-10B | 12/20/2001 | 1.0 | U |
| DC-10B | 4/11/2006 | 1.0 | U |
| DC-10B | 4/26/2007 | **0.34** | |
| DC-10B | 11/3/2010 | **2.6** | |
| DC-10B | 5/30/2011 | 2.0 | U |
| DC-10B | 7/19/2011 | 2.0 | U |
| DC-10B | 10/18/2011 | 2.0 | U |
| DC-10B | 4/6/2012 | 2.0 | U |
| | | | |
| KMW-05D | 4/25/2007 | 0.2 | U |
| KMW-05D | 4/3/2012 | 2.0 | U |
| | | | |

# Table C-1
# Historical Summary of Groundwater Analytical Results
# Manhattan Village Shopping Center and Harris Properties
# Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) |
|---|---|---|

NOTES:

1. Tetrachloroethene (PCE) concentrations in migrograms per liter (µg/l).
2. Groundwater samples analyzed using USEPA Method 8260B.
3. U = concentration not detected at or above the laboratory practical quantitation limit (PQL).
4. Detected concentrations are shown in **bold.**
5. Concentrations exceeding the cleanup level are **bold and shaded**.
6. Shallow monitoring wells are screened at the top of the shallow aquifer, and deep monitoring wells are screened below and deeper within the shallow aquifer.
7. Review of historical results indicate that DC-17 was inadvertently sampled as DC-5 in 2010, 2011 and 2012. This table reports the 2010 - 2012 DC-17 data as DC-5.

| CAD File: | Drawn By: | Date: | Project No. |
|---|---|---|---|
| G:\\0159723\01\015972301-02.dwg | R. Olson | 08/23/12 | 0159723.001 |

N

0 50' 100' 200'

1" = 100'

SW 176th STREET

SW 177th STREET

SW 178th STREET

1st AVE SOUTH

2nd AVE SW

RESIDENCES

DUNN LUMBER

HARRIS PROPERTY

COMMERCIAL BUILDING

RESIDENCE

VACANT SHED

FORMER SEPTIC TANK

PHONE BOOTH

FORMER LAUNDROMAT/ DRY CLEANER

SIGN

RETAINING WALL

FORMER DAIRY QUEEN

CONDOMINIUMS

PARKING LOT

SECOND BUILDING (VARIOUS SHOPS)

FOUR STAR DRY CLEANERS

TREATMENT SYSTEM

BUILDING

SUSPECTED SEPTIC TANK

QFC BUILDING

MANHATTAN VILLAGE SHOPPING CENTER

| | | | | | |
|---|---|---|---|---|---|
| MW-9 | 2.0U | MW-8 | 2.0U | MW-7 | 14 |
| MW-6 | 2.0U | KMW-6 | 2.0U | KMW-7 | 3.3 |
| KMW-8 | 10 | KMW-3 | 6.8 | DC-14 | 11 |
| DC-7 | 18 | DC-8 | 18 | MW-5 | 2.0U |
| KMW-5D | 2.0U | KMW-5 | 2.0U | DC-15 | 20 |
| MW-14 | 2.0U | KMW-1 | 2.0U | DC-17 | 2.0U |
| DC-16 | 2.0U | DC-18 | 7.2 | DC-13 | 6.4 |
| KMW-4 | 2.0U | MW-10 | 6.7 | DC-6 | MW-2 7.1 |
| DC-12 | 3.7 | MW-1 | | DC-9A | DC-9B |
| MW-11 | 29 | DC-10B | 2.0U | DC-10A | 41 |
| KMW-2 | 25 | MW-15 | 2.0U | KMW-9 | 4.0 |
| DC-11 | 3.1 | DC-3 | 2.9 | DC-4 | 22 |
| DC-2 | 2.0U | MW-13 | 2.0U | DC-19 | 2.0U |
| MW-4 | 11 | DC-1 | 2.0U | MW-3 | 5.8 |
| MW-12 | 2.0U | | | | |

Source:
ERM-West, Inc. 2012. Revised Feasibility Study, Manhattan Village Shopping Center and Harris Properties, 17817-17825 and 17835 1st Avenue South, Normandy Park, Washington. September.

LEGEND

- ABANDONED, LOST OR DESTROYED MONITORING WELL
- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- 2.0U / 3.1 / 11 — TETRACHLOROETHENE (PCE) CONCENTRATION (µg/L); BOLDED VALUE INDICATES GREATER THAN DETECTION LEVEL AND LESS THAN CLEANUP LEVEL; BLUE SHADING INDICATES GREATER THAN CLEANUP LEVEL
- U — NOT DETECTED AT METHOD DETECTION LIMIT
- 10 — PCE CONCENTRATION CONTOUR (µg/L); DASHED WHERE INFERRED
- APPROXIMATE HARRIS PROPERTY BOUNDARY
- APPROXIMATE MANHATTAN VILLAGE SHOPPING CENTER PROPERTY BOUNDARY
- E — UNDERGROUND ELECTRICAL UTILITY
- G — UNDERGROUND NATURAL GAS UTILITY
- SS — UNDERGROUND SEWER UTILITY
- SD — UNDERGROUND STORM DRAIN UTILITY
- W — UNDERGROUND WATER UTILITY

Figure 4

*Tetrachloroethene in Groundwater, April 2012*

*MVSC/Harris Properties*

*Normandy Park, Washington*

ERM 08/12

# ATTACHMENT D
# LABORATORY REPORTS AND DATA VALIDATION MEMORANDA

ESC
L·A·B S·C·I·E·N·C·E·S
YOUR LAB OF CHOICE

12065 Lebanon Rd
Mt. Juliet, TN 37122
(615) 758-5858
(800) 767-5859
Fax (615) 758-5859
Tax I.D 62-0814289
Est. 1970

# Quality Control Summary
## SDG: L638421

**For: PES Environmental, Inc.- WA**
**Project: Manhattan Village**
**June 05, 2013**

## Sample Receiving and Handling

All sample aliquots were received at the correct temperature, in the proper containers, and with the appropriate preservatives. All method specified holding times were met.

### Volatile Organic Compounds by Method 8260B

**Laboratory Control Sample**

Samples L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, and -11 were analyzed in analytical batch WG664054. The laboratory control sample associated with these samples was within the laboratory control limits for all compounds.

**Matrix Spike/Matrix Spike Duplicate**

For analytical batch WG664054 matrix spike/matrix spike duplicate analysis was performed on sample L638421-01. The matrix spike recoveries were above laboratory control limits for Acrolein. The matrix spike recoveries were below laboratory control limits for 2-Chloroethyl vinyl ether. The spike recoveries for the remaining target compounds were within limits. The relative percent difference exceeded laboratory limits for 2-Chloroethyl vinyl ether.

**Blank Analysis**

The method blank, the initial, and all continuing calibration blanks contained no analytes at concentrations above the method reporting limit.

Nancy F. McLain
ESC Representative
ESC Lab Sciences

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Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

# Report Summary

Wednesday June 05, 2013

Report Number: L638421
Samples Received: 05/30/13
Client Project: 1358.001.01.003

Description: Manhattan Village

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Jarred Willis , ESC Representative

*Laboratory Certification Numbers*

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-01

Site ID :

Project # : 1358.001.01.003

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : MW-12

Collected By : Karsten Springstead
Collection Date : 05/28/13 14:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-01

Site ID :

Project # : 1358.001.01.003

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : MW-12

Collected By : Karsten Springstead
Collection Date : 05/28/13 14:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 05/31/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 96.1 | | % Rec. | 8260B | 05/31/13 | 1 |
| Dibromofluoromethane | 98.4 | | % Rec. | 8260B | 05/31/13 | 1 |
| 4-Bromofluorobenzene | 92.5 | | % Rec. | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-02

Date Received : May 30, 2013
Description : Manhattan Village

Site ID :

Sample ID : MW-15

Project # : 1358.001.01.003

Collected By : Karsten Springstead
Collection Date : 05/28/13 16:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : MW-15

Collected By : Karsten Springstead
Collection Date : 05/28/13 16:00

ESC Sample # : L638421-02

Site ID :

Project # : 1358.001.01.003

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 05/31/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 96.2 | | % Rec. | 8260B | 05/31/13 | 1 |
| Dibromofluoromethane | 98.9 | | % Rec. | 8260B | 05/31/13 | 1 |
| 4-Bromofluorobenzene | 94.5 | | % Rec. | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-03

Site ID :

Project # : 1358.001.01.003

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : EQ-1

Collected By : Karsten Springstead
Collection Date : 05/28/13 16:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-03

Site ID :

Project # : 1358.001.01.003

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : EQ-1

Collected By : Karsten Springstead
Collection Date : 05/28/13 16:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 05/31/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 98.0 | | % Rec. | 8260B | 05/31/13 | 1 |
| Dibromofluoromethane | 100. | | % Rec. | 8260B | 05/31/13 | 1 |
| 4-Bromofluorobenzene | 96.0 | | % Rec. | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-04

Site ID :

Project # : 1358.001.01.003

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : MW-13

Collected By : Karsten Springstead
Collection Date : 05/29/13 08:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-04

Site ID :

Project # : 1358.001.01.003

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : MW-13

Collected By : Karsten Springstead
Collection Date : 05/29/13 08:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 05/31/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 97.2 | | % Rec. | 8260B | 05/31/13 | 1 |
| Dibromofluoromethane | 101. | | % Rec. | 8260B | 05/31/13 | 1 |
| 4-Bromofluorobenzene | 93.8 | | % Rec. | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-05

Site ID :

Project # : 1358.001.01.003

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : MW-14

Collected By : Karsten Springstead
Collection Date : 05/29/13 09:45

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : MW-14

Collected By : Karsten Springstead
Collection Date : 05/29/13 09:45

ESC Sample # : L638421-05

Site ID :

Project # : 1358.001.01.003

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 05/31/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 98.0 | | % Rec. | 8260B | 05/31/13 | 1 |
| Dibromofluoromethane | 99.8 | | % Rec. | 8260B | 05/31/13 | 1 |
| 4-Bromofluorobenzene | 88.6 | | % Rec. | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-06

Date Received : May 30, 2013
Description : Manhattan Village

Site ID :

Sample ID : DC-5

Project # : 1358.001.01.003

Collected By : Karsten Springstead
Collection Date : 05/29/13 10:45

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-06

Site ID :

Project # : 1358.001.01.003

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : DC-5

Collected By : Karsten Springstead
Collection Date : 05/29/13 10:45

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 05/31/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 97.6 | | % Rec. | 8260B | 05/31/13 | 1 |
| Dibromofluoromethane | 99.3 | | % Rec. | 8260B | 05/31/13 | 1 |
| 4-Bromofluorobenzene | 92.7 | | % Rec. | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-07

Date Received : May 30, 2013
Description : Manhattan Village

Site ID :

Sample ID : MW-10

Project # : 1358.001.01.003

Collected By : Karsten Springstead
Collection Date : 05/29/13 11:45

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-07

Site ID :

Project # : 1358.001.01.003

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : MW-10

Collected By : Karsten Springstead
Collection Date : 05/29/13 11:45

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Tetrachloroethene | 4.1 | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 05/31/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 97.6 | | % Rec. | 8260B | 05/31/13 | 1 |
| Dibromofluoromethane | 102. | | % Rec. | 8260B | 05/31/13 | 1 |
| 4-Bromofluorobenzene | 93.1 | | % Rec. | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-08

Date Received : May 30, 2013
Description : Manhattan Village

Site ID :

Sample ID : MW-3

Project # : 1358.001.01.003

Collected By : Karsten Springstead
Collection Date : 05/29/13 12:45

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-08

Site ID :

Project # : 1358.001.01.003

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : MW-3

Collected By : Karsten Springstead
Collection Date : 05/29/13 12:45

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Tetrachloroethene | 4.0 | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 05/31/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 97.6 | | % Rec. | 8260B | 05/31/13 | 1 |
| Dibromofluoromethane | 101. | | % Rec. | 8260B | 05/31/13 | 1 |
| 4-Bromofluorobenzene | 92.9 | | % Rec. | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-09

Date Received : May 30, 2013
Description : Manhattan Village

Site ID :

Sample ID : MW-4

Project # : 1358.001.01.003

Collected By : Karsten Springstead
Collection Date : 05/29/13 14:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : MW-4

Collected By : Karsten Springstead
Collection Date : 05/29/13 14:00

ESC Sample # : L638421-09

Site ID :

Project # : 1358.001.01.003

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Tetrachloroethene | 8.1 | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 05/31/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 97.0 | | % Rec. | 8260B | 05/31/13 | 1 |
| Dibromofluoromethane | 98.5 | | % Rec. | 8260B | 05/31/13 | 1 |
| 4-Bromofluorobenzene | 92.4 | | % Rec. | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-10

Date Received : May 30, 2013
Description : Manhattan Village

Site ID :

Sample ID : DC-14

Project # : 1358.001.01.003

Collected By : Karsten Springstead
Collection Date : 05/29/13 15:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-10

Site ID :

Project # : 1358.001.01.003

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : DC-14

Collected By : Karsten Springstead
Collection Date : 05/29/13 15:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Tetrachloroethene | 6.0 | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 05/31/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 97.5 | | % Rec. | 8260B | 05/31/13 | 1 |
| Dibromofluoromethane | 101. | | % Rec. | 8260B | 05/31/13 | 1 |
| 4-Bromofluorobenzene | 90.7 | | % Rec. | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-11

Date Received : May 30, 2013
Description : Manhattan Village

Site ID :

Sample ID : EQ-2

Project # : 1358.001.01.003

Collected By : Karsten Springstead
Collection Date : 05/29/13 15:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 05/31/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638421-11

Site ID :

Project # : 1358.001.01.003

Date Received : May 30, 2013
Description : Manhattan Village

Sample ID : EQ-2

Collected By : Karsten Springstead
Collection Date : 05/29/13 15:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 05/31/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 05/31/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 05/31/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 97.6 | | % Rec. | 8260B | 05/31/13 | 1 |
| Dibromofluoromethane | 99.7 | | % Rec. | 8260B | 05/31/13 | 1 |
| 4-Bromofluorobenzene | 91.6 | | % Rec. | 8260B | 05/31/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
This report shall not be reproduced, except in full, without the written approval from ESC.
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Reported: 06/05/13 10:27 Printed: 06/05/13 10:33

Attachment A
List of Analytes with QC Qualifiers

| Sample Number | Work Group | Sample Type | Analyte | Run ID | Qualifier |
|---|---|---|---|---|---|
| L638421-01 | WG664054 | SAMP | Acrolein | R2690802 | J5 |
| | WG664054 | SAMP | 2-Chloroethyl vinyl ether | R2690802 | J6J3 |

Attachment B
Explanation of QC Qualifier Codes

| Qualifier | Meaning |
|---|---|
| J3 | The associated batch QC was outside the established quality control range for precision. |
| J5 | The sample matrix interfered with the ability to make any accurate determination; spike value is high |
| J6 | The sample matrix interfered with the ability to make any accurate determination; spike value is low |

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

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# Quality Control Summary
## SDG: L638421
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/28/2013 **Analytic Batch: WG664054**
Analysis Date: 5/31/2013 Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11

### Method Blank

| Analyte | CAS | PQL | Qualifiers |
|---|---|---|---|
| Dichlorodifluoromethane | 75-71-8 | <0.0050 | |
| Chloromethane | 74-87-3 | <0.0025 | |
| Vinyl chloride | 75-01-4 | <0.0010 | |
| Bromomethane | 74-83-9 | <0.0050 | |
| Chloroethane | 75-00-3 | <0.0050 | |
| Trichlorofluoromethane | 75-69-4 | <0.0050 | |
| Acrolein | 107-02-8 | <0.0250 | |
| 1,1-Dichloroethene | 75-35-4 | <0.0010 | |
| 1,1,2-Trichlorotrifluoroethane | 76-13-1 | <0.0010 | |
| Acetone | 67-64-1 | <0.0500 | |
| Methylene Chloride | 75-09-2 | <0.0050 | |
| Acrylonitrile | 107-13-1 | <0.0100 | |
| trans-1,2-Dichloroethene | 156-60-5 | <0.0010 | |
| Methyl tert-butyl ether | 1634-04-4 | <0.0010 | |
| 1,1-Dichloroethane | 75-34-3 | <0.0010 | |
| Di-isopropyl ether | 108-20-3 | <0.0010 | |
| 2,2-Dichloropropane | 594-20-7 | <0.0010 | |
| cis-1,2-Dichloroethene | 156-59-2 | <0.0010 | |
| 2-Butanone (MEK) | 78-93-3 | <0.0100 | |
| Chloroform | 67-66-3 | <0.0050 | |
| 1,1,1-Trichloroethane | 71-55-6 | <0.0010 | |
| Carbon tetrachloride | 56-23-5 | <0.0010 | |
| 1,1-Dichloropropene | 563-58-6 | <0.0010 | |
| Benzene | 71-43-2 | <0.0010 | |
| 1,2-Dichloroethane | 107-06-2 | <0.0010 | |
| Trichloroethene | 79-01-6 | <0.0010 | |
| 1,2-Dichloropropane | 78-87-5 | <0.0010 | |
| Dibromomethane | 74-95-3 | <0.0010 | |
| Bromodichloromethane | 75-27-4 | <0.0010 | |
| 2-Chloroethyl vinyl ether | 110-75-8 | <0.0500 | |
| cis-1,3-Dichloropropene | 10061-01-5 | <0.0010 | |
| 4-Methyl-2-pentanone (MIBK) | 108-10-1 | <0.0100 | |
| Toluene | 108-88-3 | <0.0050 | |
| trans-1,3-Dichloropropene | 10061-02-6 | <0.0010 | |
| 1,1,2-Trichloroethane | 79-00-5 | <0.0010 | |

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# Quality Control Summary
## SDG: L638421
## PES Environmental, Inc.- WA

| | | | |
|---|---|---|---|
| Test: | Volatile Organic Compounds by Method 8260B | | |
| Project No: | 1358.001.01.003 | Matrix: | Water - mg/L |
| Project: | Manhattan Village | EPA ID: | TN00003 |
| Collection Date: | 5/28/2013 | **Analytic Batch:** | **WG664054** |
| Analysis Date: | 5/31/2013 | Analyst: | 505 |
| Instrument ID: | VOCMS28 | | |
| Sample Numbers: | L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11 | | |

### Method Blank

| Analyte | CAS | PQL | Qualifiers |
|---|---|---|---|
| Tetrachloroethene | 127-18-4 | <0.0010 | |
| 1,3-Dichloropropane | 142-28-9 | <0.0010 | |
| Chlorodibromomethane | 124-48-1 | <0.0010 | |
| 1,2-Dibromoethane | 106-93-4 | <0.0010 | |
| Chlorobenzene | 108-90-7 | <0.0010 | |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.0010 | |
| Ethylbenzene | 100-41-4 | <0.0010 | |
| m&p-Xylene | 1330-20-7 | <0.0030 | |
| o-Xylene | 1330-20-7 | <0.0030 | |
| Styrene | 100-42-5 | <0.0010 | |
| Bromoform | 75-25-2 | <0.0010 | |
| Isopropylbenzene | 98-82-8 | <0.0010 | |
| Bromobenzene | 108-86-1 | <0.0010 | |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.0010 | |
| 1,2,3-Trichloropropane | 96-18-4 | <0.0010 | |
| n-Propylbenzene | 103-65-1 | <0.0010 | |
| 2-Chlorotoluene | 95-49-8 | <0.0010 | |
| 4-Chlorotoluene | 106-43-4 | <0.0010 | |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.0010 | |
| tert-Butylbenzene | 98-06-6 | <0.0010 | |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.0010 | |
| sec-Butylbenzene | 135-98-8 | <0.0010 | |
| 1,3-Dichlorobenzene | 541-73-1 | <0.0010 | |
| p-Isopropyltoluene | 99-87-6 | <0.0010 | |
| 1,4-Dichlorobenzene | 106-46-7 | <0.0010 | |
| 1,2,3-Trimethylbenzene | 526-73-8 | <0.0010 | |
| 1,2-Dichlorobenzene | 95-50-1 | <0.0010 | |
| n-Butylbenzene | 104-51-8 | <0.0010 | |
| 1,2-Dibromo-3-Chloropropane | 96-12-8 | <0.0050 | |
| 1,2,4-Trichlorobenzene | 120-82-1 | <0.0010 | |
| Hexachloro-1,3-butadiene | 87-68-3 | <0.0010 | |
| Naphthalene | 91-20-3 | <0.0050 | |
| 1,2,3-Trichlorobenzene | 87-61-6 | <0.0010 | |

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# Quality Control Summary
## SDG: L638421
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/28/2013 **Analytic Batch: WG664054**
Analysis Date: 5/31/2013 Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11

### Laboratory Control Sample (LCS)

| Analyte | True Value | Found | Recovery % | Control Limits | Qualifiers |
|---|---|---|---|---|---|
| Dichlorodifluoromethane | 0.0250 | 0.0198 | 79.4 | 33 - 173 | |
| Chloromethane | 0.0250 | 0.0226 | 90.5 | 50 - 141 | |
| Vinyl chloride | 0.0250 | 0.0233 | 93.3 | 55 - 142 | |
| Bromomethane | 0.0250 | 0.0325 | 130 | 42 - 172 | |
| Chloroethane | 0.0250 | 0.0245 | 97.9 | 52 - 164 | |
| Trichlorofluoromethane | 0.0250 | 0.0226 | 90.2 | 53 - 161 | |
| Acrolein | 0.125 | 0.0983 | 78.6 | 10 - 181 | |
| 1,1-Dichloroethene | 0.0250 | 0.0252 | 101 | 54 - 134 | |
| 1,1,2-Trichlorotrifluoroethane | 0.0250 | 0.0272 | 109 | 53 - 143 | |
| Acetone | 0.125 | 0.110 | 87.8 | 49 - 153 | |
| Methylene Chloride | 0.0250 | 0.0212 | 84.6 | 67 - 122 | |
| Acrylonitrile | 0.125 | 0.106 | 84.5 | 53 - 153 | |
| trans-1,2-Dichloroethene | 0.0250 | 0.0234 | 93.7 | 63 - 127 | |
| Methyl tert-butyl ether | 0.0250 | 0.0228 | 91.2 | 67 - 127 | |
| 1,1-Dichloroethane | 0.0250 | 0.0237 | 94.9 | 73 - 123 | |
| Di-isopropyl ether | 0.0250 | 0.0233 | 93.0 | 66 - 129 | |
| 2,2-Dichloropropane | 0.0250 | 0.0230 | 92.1 | 63 - 130 | |
| cis-1,2-Dichloroethene | 0.0250 | 0.0233 | 93.1 | 75 - 121 | |
| 2-Butanone (MEK) | 0.125 | 0.111 | 88.6 | 58 - 144 | |
| Chloroform | 0.0250 | 0.0230 | 92.1 | 76 - 122 | |
| 1,1,1-Trichloroethane | 0.0250 | 0.0229 | 91.5 | 71 - 126 | |
| Carbon tetrachloride | 0.0250 | 0.0228 | 91.3 | 63 - 129 | |
| 1,1-Dichloropropene | 0.0250 | 0.0235 | 93.8 | 67 - 127 | |
| Benzene | 0.0250 | 0.0230 | 92.2 | 72 - 119 | |
| 1,2-Dichloroethane | 0.0250 | 0.0216 | 86.3 | 69 - 128 | |
| Trichloroethene | 0.0250 | 0.0237 | 94.9 | 69 - 131 | |
| 1,2-Dichloropropane | 0.0250 | 0.0232 | 92.9 | 77 - 121 | |
| Dibromomethane | 0.0250 | 0.0234 | 93.6 | 77 - 124 | |
| Bromodichloromethane | 0.0250 | 0.0216 | 86.6 | 75 - 127 | |
| 2-Chloroethyl vinyl ether | 0.125 | 0.104 | 83.0 | 26 - 172 | |
| cis-1,3-Dichloropropene | 0.0250 | 0.0230 | 92.0 | 74 - 124 | |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.119 | 94.9 | 58 - 147 | |
| Toluene | 0.0250 | 0.0226 | 90.6 | 75 - 114 | |
| trans-1,3-Dichloropropene | 0.0250 | 0.0239 | 95.7 | 69 - 124 | |
| 1,1,2-Trichloroethane | 0.0250 | 0.0232 | 92.8 | 81 - 121 | |

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# Quality Control Summary
## SDG: L638421
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/28/2013 **Analytic Batch: WG664054**
Analysis Date: 5/31/2013 Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11

### Laboratory Control Sample (LCS)

| Analyte | True Value | Found | Recovery % | Control Limits | Qualifiers |
|---|---|---|---|---|---|
| Tetrachloroethene | 0.0250 | 0.0239 | 95.6 | 69 - 131 | |
| 1,3-Dichloropropane | 0.0250 | 0.0224 | 89.4 | 78 - 117 | |
| Chlorodibromomethane | 0.0250 | 0.0226 | 90.4 | 73 - 128 | |
| 1,2-Dibromoethane | 0.0250 | 0.0231 | 92.4 | 78 - 124 | |
| Chlorobenzene | 0.0250 | 0.0231 | 92.6 | 78 - 123 | |
| 1,1,1,2-Tetrachloroethane | 0.0250 | 0.0239 | 95.5 | 77 - 128 | |
| Ethylbenzene | 0.0250 | 0.0234 | 93.7 | 77 - 124 | |
| m&p-Xylene | 0.0500 | 0.0465 | 92.9 | 76 - 123 | |
| o-Xylene | 0.0250 | 0.0230 | 92.0 | 77 - 125 | |
| Styrene | 0.0250 | 0.0244 | 97.6 | 69 - 145 | |
| Bromoform | 0.0250 | 0.0240 | 96.0 | 61 - 136 | |
| Isopropylbenzene | 0.0250 | 0.0249 | 99.8 | 74 - 126 | |
| Bromobenzene | 0.0250 | 0.0215 | 86.2 | 76 - 121 | |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0221 | 88.3 | 78 - 130 | |
| 1,2,3-Trichloropropane | 0.0250 | 0.0216 | 86.2 | 68 - 130 | |
| n-Propylbenzene | 0.0250 | 0.0231 | 92.4 | 77 - 125 | |
| 2-Chlorotoluene | 0.0250 | 0.0225 | 90.0 | 78 - 123 | |
| 4-Chlorotoluene | 0.0250 | 0.0215 | 86.0 | 78 - 122 | |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0228 | 91.3 | 78 - 127 | |
| tert-Butylbenzene | 0.0250 | 0.0231 | 92.6 | 76 - 131 | |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0222 | 88.8 | 77 - 129 | |
| sec-Butylbenzene | 0.0250 | 0.0231 | 92.3 | 77 - 130 | |
| 1,3-Dichlorobenzene | 0.0250 | 0.0221 | 88.4 | 77 - 127 | |
| p-Isopropyltoluene | 0.0250 | 0.0240 | 95.9 | 77 - 132 | |
| 1,4-Dichlorobenzene | 0.0250 | 0.0229 | 91.6 | 79 - 117 | |
| 1,2,3-Trimethylbenzene | 0.0250 | 0.0210 | 84.1 | 77 - 126 | |
| 1,2-Dichlorobenzene | 0.0250 | 0.0225 | 90.1 | 82 - 121 | |
| n-Butylbenzene | 0.0250 | 0.0230 | 91.9 | 74 - 130 | |
| 1,2-Dibromo-3-Chloropropane | 0.0250 | 0.0240 | 96.2 | 55 - 142 | |
| 1,2,4-Trichlorobenzene | 0.0250 | 0.0248 | 99.3 | 76 - 127 | |
| Hexachloro-1,3-butadiene | 0.0250 | 0.0233 | 93.3 | 71 - 134 | |
| Naphthalene | 0.0250 | 0.0224 | 89.8 | 70 - 134 | |
| 1,2,3-Trichlorobenzene | 0.0250 | 0.0240 | 96.1 | 77 - 130 | |

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# Quality Control Summary
## SDG: L638421
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/28/2013 **Analytic Batch: WG664054**
Analysis Date: 5/31/2013 Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11

### Laboratory Control Sample Duplicate (LCSD)

| Analyte | True Value | Found | Recovery % | Control Limits | Qualifiers |
|---|---|---|---|---|---|
| Dichlorodifluoromethane | 0.0250 | 0.0191 | 76.4 | 33 - 173 | |
| Chloromethane | 0.0250 | 0.0224 | 89.5 | 50 - 141 | |
| Vinyl chloride | 0.0250 | 0.0230 | 92.0 | 55 - 142 | |
| Bromomethane | 0.0250 | 0.0323 | 129 | 42 - 172 | |
| Chloroethane | 0.0250 | 0.0241 | 96.3 | 52 - 164 | |
| Trichlorofluoromethane | 0.0250 | 0.0218 | 87.2 | 53 - 161 | |
| Acrolein | 0.125 | 0.118 | 94.6 | 10 - 181 | |
| 1,1-Dichloroethene | 0.0250 | 0.0242 | 96.6 | 54 - 134 | |
| 1,1,2-Trichlorotrifluoroethane | 0.0250 | 0.0256 | 102 | 53 - 143 | |
| Acetone | 0.125 | 0.119 | 94.9 | 49 - 153 | |
| Methylene Chloride | 0.0250 | 0.0212 | 84.6 | 67 - 122 | |
| Acrylonitrile | 0.125 | 0.109 | 87.1 | 53 - 153 | |
| trans-1,2-Dichloroethene | 0.0250 | 0.0226 | 90.4 | 63 - 127 | |
| Methyl tert-butyl ether | 0.0250 | 0.0233 | 93.0 | 67 - 127 | |
| 1,1-Dichloroethane | 0.0250 | 0.0232 | 92.9 | 73 - 123 | |
| Di-isopropyl ether | 0.0250 | 0.0229 | 91.7 | 66 - 129 | |
| 2,2-Dichloropropane | 0.0250 | 0.0232 | 92.7 | 63 - 130 | |
| cis-1,2-Dichloroethene | 0.0250 | 0.0229 | 91.5 | 75 - 121 | |
| 2-Butanone (MEK) | 0.125 | 0.119 | 95.3 | 58 - 144 | |
| Chloroform | 0.0250 | 0.0227 | 90.9 | 76 - 122 | |
| 1,1,1-Trichloroethane | 0.0250 | 0.0226 | 90.5 | 71 - 126 | |
| Carbon tetrachloride | 0.0250 | 0.0223 | 89.0 | 63 - 129 | |
| 1,1-Dichloropropene | 0.0250 | 0.0228 | 91.4 | 67 - 127 | |
| Benzene | 0.0250 | 0.0224 | 89.7 | 72 - 119 | |
| 1,2-Dichloroethane | 0.0250 | 0.0211 | 84.5 | 69 - 128 | |
| Trichloroethene | 0.0250 | 0.0233 | 93.0 | 69 - 131 | |
| 1,2-Dichloropropane | 0.0250 | 0.0229 | 91.7 | 77 - 121 | |
| Dibromomethane | 0.0250 | 0.0230 | 91.9 | 77 - 124 | |
| Bromodichloromethane | 0.0250 | 0.0212 | 84.6 | 75 - 127 | |
| 2-Chloroethyl vinyl ether | 0.125 | 0.105 | 84.3 | 26 - 172 | |
| cis-1,3-Dichloropropene | 0.0250 | 0.0225 | 89.9 | 74 - 124 | |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.123 | 98.3 | 58 - 147 | |
| Toluene | 0.0250 | 0.0220 | 88.1 | 75 - 114 | |
| trans-1,3-Dichloropropene | 0.0250 | 0.0237 | 94.6 | 69 - 124 | |
| 1,1,2-Trichloroethane | 0.0250 | 0.0228 | 91.3 | 81 - 121 | |

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# Quality Control Summary
## SDG: L638421
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/28/2013 **Analytic Batch: WG664054**
Analysis Date: 5/31/2013 Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11

### Laboratory Control Sample Duplicate (LCSD)

| Analyte | True Value | Found | Recovery % | Control Limits | Qualifiers |
|---|---|---|---|---|---|
| Tetrachloroethene | 0.0250 | 0.0228 | 91.3 | 69 - 131 | |
| 1,3-Dichloropropane | 0.0250 | 0.0222 | 88.8 | 78 - 117 | |
| Chlorodibromomethane | 0.0250 | 0.0222 | 88.8 | 73 - 128 | |
| 1,2-Dibromoethane | 0.0250 | 0.0227 | 90.9 | 78 - 124 | |
| Chlorobenzene | 0.0250 | 0.0226 | 90.2 | 78 - 123 | |
| 1,1,1,2-Tetrachloroethane | 0.0250 | 0.0232 | 93.0 | 77 - 128 | |
| Ethylbenzene | 0.0250 | 0.0225 | 89.8 | 77 - 124 | |
| m&p-Xylene | 0.0500 | 0.0442 | 88.3 | 76 - 123 | |
| o-Xylene | 0.0250 | 0.0221 | 88.3 | 77 - 125 | |
| Styrene | 0.0250 | 0.0237 | 94.8 | 69 - 145 | |
| Bromoform | 0.0250 | 0.0238 | 95.1 | 61 - 136 | |
| Isopropylbenzene | 0.0250 | 0.0242 | 97.0 | 74 - 126 | |
| Bromobenzene | 0.0250 | 0.0207 | 82.9 | 76 - 121 | |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0219 | 87.6 | 78 - 130 | |
| 1,2,3-Trichloropropane | 0.0250 | 0.0220 | 87.9 | 68 - 130 | |
| n-Propylbenzene | 0.0250 | 0.0220 | 88.0 | 77 - 125 | |
| 2-Chlorotoluene | 0.0250 | 0.0217 | 86.9 | 78 - 123 | |
| 4-Chlorotoluene | 0.0250 | 0.0209 | 83.7 | 78 - 122 | |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0219 | 87.5 | 78 - 127 | |
| tert-Butylbenzene | 0.0250 | 0.0223 | 89.3 | 76 - 131 | |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0214 | 85.8 | 77 - 129 | |
| sec-Butylbenzene | 0.0250 | 0.0221 | 88.4 | 77 - 130 | |
| 1,3-Dichlorobenzene | 0.0250 | 0.0218 | 87.1 | 77 - 127 | |
| p-Isopropyltoluene | 0.0250 | 0.0229 | 91.7 | 77 - 132 | |
| 1,4-Dichlorobenzene | 0.0250 | 0.0220 | 88.0 | 79 - 117 | |
| 1,2,3-Trimethylbenzene | 0.0250 | 0.0205 | 82.1 | 77 - 126 | |
| 1,2-Dichlorobenzene | 0.0250 | 0.0223 | 89.0 | 82 - 121 | |
| n-Butylbenzene | 0.0250 | 0.0217 | 86.9 | 74 - 130 | |
| 1,2-Dibromo-3-Chloropropane | 0.0250 | 0.0244 | 97.6 | 55 - 142 | |
| 1,2,4-Trichlorobenzene | 0.0250 | 0.0246 | 98.5 | 76 - 127 | |
| Hexachloro-1,3-butadiene | 0.0250 | 0.0227 | 91.0 | 71 - 134 | |
| Naphthalene | 0.0250 | 0.0228 | 91.2 | 70 - 134 | |
| 1,2,3-Trichlorobenzene | 0.0250 | 0.0236 | 94.4 | 77 - 130 | |

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# Quality Control Summary
## SDG: L638421
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/28/2013 **Analytic Batch: WG664054**
Analysis Date: 5/31/2013 Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11

### Surrogate Summary

| Laboratory | Dibromofluoromethane | | Toluene-d8 | | 4-Bromofluorobenzene | | **Alternate Surrogate** a,a,a-Trifluorotoluene | |
|---|---|---|---|---|---|---|---|---|
| Sample ID | ppb | % Rec | ppb | % Rec | ppb | % Rec | ppb | % Rec |
| LCS WG664054 | 39.3 | 98.2 | 38.9 | 97.3 | 36.9 | 92.3 | 40.2 | 101 |
| LCSD WG664054 | 40.0 | 100.0 | 38.9 | 97.4 | 36.8 | 92.1 | 39.8 | 99.6 |
| MS WG664054 | 38.7 | 96.8 | 39.1 | 97.8 | 36.8 | 92.0 | 39.9 | 99.7 |
| MSD WG664054 | 38.7 | 96.7 | 39.0 | 97.5 | 36.6 | 91.5 | 39.6 | 99.0 |
| Blank WG664054 | 39.3 | 98.2 | 38.2 | 95.5 | 37.4 | 93.6 | 39.1 | 97.8 |
| L638421-01 | 39.4 | 98.4 | 38.4 | 96.1 | 37.0 | 92.5 | 39.4 | 98.5 |
| L638421-02 | 39.5 | 98.8 | 38.5 | 96.2 | 37.8 | 94.5 | 38.5 | 96.3 |
| L638421-03 | 40.1 | 100 | 39.2 | 98.0 | 38.4 | 96.0 | 39.6 | 99.0 |
| L638421-04 | 40.2 | 101 | 38.9 | 97.2 | 37.5 | 93.8 | 39.5 | 98.8 |
| L638421-05 | 39.9 | 99.8 | 39.2 | 98.0 | 35.4 | 88.6 | 40.4 | 101 |
| L638421-06 | 39.7 | 99.3 | 39.1 | 97.6 | 37.1 | 92.7 | 39.2 | 98.0 |
| L638421-07 | 40.6 | 102 | 39.1 | 97.6 | 37.2 | 93.1 | 39.7 | 99.4 |
| L638421-08 | 40.5 | 101 | 39.0 | 97.6 | 37.2 | 92.9 | 39.4 | 98.4 |
| L638421-09 | 39.4 | 98.5 | 38.8 | 97.0 | 37.0 | 92.4 | 39.2 | 98.1 |
| L638421-10 | 40.5 | 101 | 39.0 | 97.5 | 36.3 | 90.7 | 39.4 | 98.4 |
| L638421-11 | 39.9 | 99.7 | 39.0 | 97.6 | 36.6 | 91.5 | 39.8 | 99.4 |

| | | |
|---|---|---|
| Dibromofluoromethane | 40 ppb | 82 - 126 |
| Toluene - d8 | 40 ppb | 92 - 112 |
| 4-Bromofluorobenzene | 40 ppb | 82 - 120 |
| **Alternate Surrogate** | | |
| a,a,a-Trifluorotoluene | 40 ppb | 90 - 116 |

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# Quality Control Summary
## SDG: L638421
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 — Matrix: Water - mg/L
Project: Manhattan Village — EPA ID: TN00003
Collection Date: 5/28/2013 — **Analytic Batch: WG664054**
Analysis Date: 5/31/2013 — Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11

### Matrix Spike/Matrix Spike Duplicate

L638421-01

| Analyte | Spike Value | Sample | MS | % Rec | MSD | % Rec | Control Limits | % Rec Qualifier | % RPD | Control Limits | RPD Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | 0.0250 | 0.0000 | 0.0161 | 64.6 | 0.0163 | 65.4 | 16-188 | | 1.2 | 22 | |
| Chloromethane | 0.0250 | 0.0000 | 0.0184 | 73.7 | 0.0188 | 75.3 | 27-155 | | 2.1 | 20 | |
| Vinyl chloride | 0.0250 | 0.0000 | 0.0200 | 80.0 | 0.0199 | 79.6 | 32-159 | | 0.5 | 21 | |
| Bromomethane | 0.0250 | 0.0000 | 0.0266 | 107 | 0.0275 | 110 | 23-177 | | 3.3 | 21 | |
| Chloroethane | 0.0250 | 0.0000 | 0.0212 | 84.8 | 0.0217 | 86.7 | 32-177 | | 2.1 | 21 | |
| Trichlorofluoromethane | 0.0250 | 0.0000 | 0.0207 | 82.6 | 0.0209 | 83.4 | 35-177 | | 1.0 | 23 | |
| Acrolein | 0.125 | 0.0000 | 0.485 | 388 | 0.501 | 401 | 10-189 | J5 | 3.3 | 30 | |
| 1,1-Dichloroethene | 0.0250 | 0.0000 | 0.0231 | 92.4 | 0.0233 | 93.3 | 32-152 | | 0.9 | 20 | |
| 1,1,2-Trichlorotrifluoroethane | 0.0250 | 0.0000 | 0.0252 | 101 | 0.0259 | 104 | 36-159 | | 2.7 | 21 | |
| Acetone | 0.125 | 0.0000 | 0.0614 | 49.2 | 0.0604 | 48.3 | 34-146 | | 1.7 | 22 | |
| Methylene Chloride | 0.0250 | 0.0000 | 0.0199 | 79.4 | 0.0201 | 80.4 | 52-130 | | 1.2 | 20 | |
| Acrylonitrile | 0.125 | 0.0000 | 0.111 | 88.9 | 0.109 | 87.1 | 49-162 | | 2.0 | 20 | |
| trans-1,2-Dichloroethene | 0.0250 | 0.0000 | 0.0213 | 85.3 | 0.0215 | 86.1 | 45-137 | | 1.0 | 20 | |
| Methyl tert-butyl ether | 0.0250 | 0.0000 | 0.0228 | 91.0 | 0.0230 | 92.1 | 55-136 | | 1.1 | 20 | |
| 1,1-Dichloroethane | 0.0250 | 0.0000 | 0.0221 | 88.3 | 0.0226 | 90.6 | 58-133 | | 2.6 | 20 | |
| Di-isopropyl ether | 0.0250 | 0.0000 | 0.0223 | 89.2 | 0.0227 | 90.7 | 58-133 | | 1.6 | 20 | |
| 2,2-Dichloropropane | 0.0250 | 0.0000 | 0.0226 | 90.3 | 0.0226 | 90.4 | 51-141 | | 0.0 | 20 | |
| cis-1,2-Dichloroethene | 0.0250 | 0.0000 | 0.0221 | 88.4 | 0.0223 | 89.1 | 54-137 | | 0.8 | 20 | |
| 2-Butanone (MEK) | 0.125 | 0.0000 | 0.0854 | 68.3 | 0.0842 | 67.4 | 51-149 | | 1.4 | 22 | |
| Chloroform | 0.0250 | 0.0000 | 0.0220 | 88.2 | 0.0225 | 89.9 | 64-130 | | 2.0 | 20 | |
| 1,1,1-Trichloroethane | 0.0250 | 0.0000 | 0.0220 | 87.8 | 0.0225 | 90.1 | 58-137 | | 2.6 | 20 | |
| Carbon tetrachloride | 0.0250 | 0.0000 | 0.0218 | 87.3 | 0.0221 | 88.5 | 49-140 | | 1.4 | 20 | |
| 1,1-Dichloropropene | 0.0250 | 0.0000 | 0.0223 | 89.1 | 0.0223 | 89.3 | 50-140 | | 0.2 | 20 | |
| Benzene | 0.0250 | 0.0000 | 0.0217 | 86.8 | 0.0220 | 88.0 | 51-134 | | 1.4 | 20 | |
| 1,2-Dichloroethane | 0.0250 | 0.0000 | 0.0212 | 84.7 | 0.0212 | 84.7 | 59-135 | | 0.0 | 20 | |
| Trichloroethene | 0.0250 | 0.0000 | 0.0224 | 89.5 | 0.0225 | 89.8 | 40-155 | | 0.4 | 20 | |
| 1,2-Dichloropropane | 0.0250 | 0.0000 | 0.0228 | 91.1 | 0.0228 | 91.1 | 68-126 | | 0.0 | 20 | |
| Dibromomethane | 0.0250 | 0.0000 | 0.0231 | 92.3 | 0.0225 | 89.8 | 68-131 | | 2.8 | 20 | |
| Bromodichloromethane | 0.0250 | 0.0000 | 0.0212 | 84.7 | 0.0208 | 83.1 | 67-132 | | 1.9 | 20 | |
| 2-Chloroethyl vinyl ether | 0.125 | 0.0000 | 0.0105 | 8.4 | 0.0022 | 1.7 | 10-161 | J6 | 132 | 40 | J3 |
| cis-1,3-Dichloropropene | 0.0250 | 0.0000 | 0.0228 | 91.1 | 0.0221 | 88.4 | 63-127 | | 3.0 | 20 | |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.0000 | 0.129 | 103 | 0.124 | 99.4 | 53-154 | | 3.9 | 21 | |
| Toluene | 0.0250 | 0.0000 | 0.0221 | 88.5 | 0.0219 | 87.6 | 61-126 | | 1.0 | 20 | |
| trans-1,3-Dichloropropene | 0.0250 | 0.0000 | 0.0233 | 93.1 | 0.0232 | 92.9 | 59-130 | | 0.2 | 20 | |
| 1,1,2-Trichloroethane | 0.0250 | 0.0000 | 0.0230 | 91.9 | 0.0226 | 90.5 | 73-128 | | 1.5 | 20 | |
| Tetrachloroethene | 0.0250 | 0.0000 | 0.0229 | 91.5 | 0.0227 | 90.8 | 56-139 | | 0.7 | 20 | |
| 1,3-Dichloropropane | 0.0250 | 0.0000 | 0.0226 | 90.2 | 0.0224 | 89.7 | 70-122 | | 0.5 | 20 | |

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# Quality Control Summary
## SDG: L638421
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/28/2013 **Analytic Batch: WG664054**
Analysis Date: 5/31/2013 Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11

### Matrix Spike/Matrix Spike Duplicate

L638421-01

| Analyte | Spike Value | Sample | MS | % Rec | MSD | % Rec | Control Limits | % Rec Qualifier | % RPD | Control Limits | RPD Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chlorodibromomethane | 0.0250 | 0.0000 | 0.0225 | 90.0 | 0.0227 | 90.8 | 68-130 | | 0.8 | 20 | |
| 1,2-Dibromoethane | 0.0250 | 0.0000 | 0.0235 | 94.0 | 0.0234 | 93.7 | 71-129 | | 0.3 | 20 | |
| Chlorobenzene | 0.0250 | 0.0000 | 0.0225 | 89.9 | 0.0226 | 90.5 | 69-126 | | 0.6 | 20 | |
| 1,1,1,2-Tetrachloroethane | 0.0250 | 0.0000 | 0.0230 | 92.0 | 0.0230 | 91.9 | 71-130 | | 0.1 | 20 | |
| Ethylbenzene | 0.0250 | 0.0000 | 0.0226 | 90.4 | 0.0230 | 91.8 | 64-135 | | 1.6 | 20 | |
| m&p-Xylene | 0.0500 | 0.0000 | 0.0450 | 90.1 | 0.0455 | 91.0 | 62-135 | | 1.0 | 20 | |
| o-Xylene | 0.0250 | 0.0000 | 0.0221 | 88.4 | 0.0222 | 88.7 | 63-135 | | 0.3 | 20 | |
| Styrene | 0.0250 | 0.0000 | 0.0236 | 94.3 | 0.0238 | 95.1 | 58-152 | | 0.9 | 20 | |
| Bromoform | 0.0250 | 0.0000 | 0.0241 | 96.4 | 0.0244 | 97.5 | 59-137 | | 1.1 | 20 | |
| Isopropylbenzene | 0.0250 | 0.0000 | 0.0243 | 97.2 | 0.0246 | 98.5 | 62-134 | | 1.3 | 20 | |
| Bromobenzene | 0.0250 | 0.0000 | 0.0207 | 83.0 | 0.0210 | 83.9 | 64-130 | | 1.0 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0000 | 0.0227 | 91.0 | 0.0231 | 92.5 | 64-149 | | 1.6 | 20 | |
| 1,2,3-Trichloropropane | 0.0250 | 0.0000 | 0.0231 | 92.4 | 0.0225 | 89.8 | 74-137 | | 2.8 | 20 | |
| n-Propylbenzene | 0.0250 | 0.0000 | 0.0224 | 89.4 | 0.0225 | 90.0 | 62-137 | | 0.6 | 20 | |
| 2-Chlorotoluene | 0.0250 | 0.0000 | 0.0218 | 87.1 | 0.0218 | 87.2 | 65-133 | | 0.1 | 20 | |
| 4-Chlorotoluene | 0.0250 | 0.0000 | 0.0211 | 84.5 | 0.0209 | 83.8 | 67-129 | | 0.9 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0000 | 0.0220 | 88.2 | 0.0222 | 88.6 | 67-136 | | 0.5 | 20 | |
| tert-Butylbenzene | 0.0250 | 0.0000 | 0.0225 | 90.0 | 0.0229 | 91.5 | 66-139 | | 1.6 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0000 | 0.0217 | 86.6 | 0.0215 | 86.0 | 62-141 | | 0.7 | 20 | |
| sec-Butylbenzene | 0.0250 | 0.0000 | 0.0226 | 90.2 | 0.0225 | 90.1 | 67-139 | | 0.2 | 20 | |
| 1,3-Dichlorobenzene | 0.0250 | 0.0000 | 0.0221 | 88.3 | 0.0219 | 87.8 | 69-131 | | 0.6 | 20 | |
| p-Isopropyltoluene | 0.0250 | 0.0000 | 0.0233 | 93.2 | 0.0234 | 93.4 | 64-142 | | 0.2 | 20 | |
| 1,4-Dichlorobenzene | 0.0250 | 0.0000 | 0.0223 | 89.3 | 0.0222 | 88.8 | 70-123 | | 0.6 | 20 | |
| 1,2,3-Trimethylbenzene | 0.0250 | 0.0000 | 0.0201 | 80.5 | 0.0202 | 80.8 | 67-133 | | 0.3 | 20 | |
| 1,2-Dichlorobenzene | 0.0250 | 0.0000 | 0.0218 | 87.3 | 0.0217 | 86.9 | 75-125 | | 0.5 | 20 | |
| n-Butylbenzene | 0.0250 | 0.0000 | 0.0225 | 90.0 | 0.0223 | 89.0 | 62-142 | | 1.1 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0250 | 0.0000 | 0.0254 | 102 | 0.0251 | 100 | 55-148 | | 1.4 | 22 | |
| 1,2,4-Trichlorobenzene | 0.0250 | 0.0000 | 0.0242 | 96.8 | 0.0239 | 95.7 | 67-133 | | 1.1 | 20 | |
| Hexachloro-1,3-butadiene | 0.0250 | 0.0000 | 0.0229 | 91.7 | 0.0223 | 89.3 | 64-140 | | 2.7 | 20 | |
| Naphthalene | 0.0250 | 0.0000 | 0.0227 | 90.7 | 0.0222 | 88.7 | 65-140 | | 2.3 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0250 | 0.0000 | 0.0229 | 91.6 | 0.0229 | 91.8 | 68-135 | | 0.2 | 20 | |

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# Quality Control Summary
## SDG: L638421
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/28/2013 **Analytic Batch: WG664054**
Analysis Date: 5/31/2013 Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11

### Laboratory Control Sample/ Laboratory Control Sample Duplicate

| Analyte | Spike | LCS | % Rec | LCSD | % Rec | Control Limits | Qualifier | % RPD | Control Limits | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | 0.0250 | 0.0198 | 79.4 | 0.0191 | 76.4 | 33-173 | | 3.9 | 20 | |
| Chloromethane | 0.0250 | 0.0226 | 90.5 | 0.0224 | 89.5 | 50-141 | | 1.1 | 20 | |
| Vinyl chloride | 0.0250 | 0.0233 | 93.3 | 0.0230 | 92.0 | 55-142 | | 1.4 | 20 | |
| Bromomethane | 0.0250 | 0.0325 | 130 | 0.0323 | 129 | 42-172 | | 0.6 | 20 | |
| Chloroethane | 0.0250 | 0.0245 | 97.9 | 0.0241 | 96.3 | 52-164 | | 1.7 | 20 | |
| Trichlorofluoromethane | 0.0250 | 0.0226 | 90.2 | 0.0218 | 87.2 | 53-161 | | 3.4 | 20 | |
| Acrolein | 0.125 | 0.0983 | 78.6 | 0.118 | 94.6 | 10-181 | | 18 | 30 | |
| 1,1-Dichloroethene | 0.0250 | 0.0252 | 101 | 0.0242 | 96.6 | 54-134 | | 4.2 | 20 | |
| 1,1,2-Trichlorotrifluoroethane | 0.0250 | 0.0272 | 109 | 0.0256 | 102 | 53-143 | | 6.0 | 20 | |
| Acetone | 0.125 | 0.110 | 87.8 | 0.119 | 94.9 | 49-153 | | 7.8 | 21 | |
| Methylene Chloride | 0.0250 | 0.0212 | 84.6 | 0.0212 | 84.6 | 67-122 | | 0.0 | 20 | |
| Acrylonitrile | 0.125 | 0.106 | 84.5 | 0.109 | 87.1 | 53-153 | | 3.1 | 20 | |
| trans-1,2-Dichloroethene | 0.0250 | 0.0234 | 93.7 | 0.0226 | 90.4 | 63-127 | | 3.6 | 20 | |
| Methyl tert-butyl ether | 0.0250 | 0.0228 | 91.2 | 0.0233 | 93.0 | 67-127 | | 2.0 | 20 | |
| 1,1-Dichloroethane | 0.0250 | 0.0237 | 94.9 | 0.0232 | 92.9 | 73-123 | | 2.1 | 20 | |
| Di-isopropyl ether | 0.0250 | 0.0233 | 93.0 | 0.0229 | 91.7 | 66-129 | | 1.5 | 20 | |
| 2,2-Dichloropropane | 0.0250 | 0.0230 | 92.1 | 0.0232 | 92.7 | 63-130 | | 0.6 | 20 | |
| cis-1,2-Dichloroethene | 0.0250 | 0.0233 | 93.1 | 0.0229 | 91.5 | 75-121 | | 1.7 | 20 | |
| 2-Butanone (MEK) | 0.125 | 0.111 | 88.6 | 0.119 | 95.3 | 58-144 | | 7.3 | 20 | |
| Chloroform | 0.0250 | 0.0230 | 92.1 | 0.0227 | 90.9 | 76-122 | | 1.3 | 20 | |
| 1,1,1-Trichloroethane | 0.0250 | 0.0229 | 91.5 | 0.0226 | 90.5 | 71-126 | | 1.1 | 20 | |
| Carbon tetrachloride | 0.0250 | 0.0228 | 91.3 | 0.0223 | 89.0 | 63-129 | | 2.5 | 20 | |
| 1,1-Dichloropropene | 0.0250 | 0.0235 | 93.8 | 0.0228 | 91.4 | 67-127 | | 2.6 | 20 | |
| Benzene | 0.0250 | 0.0230 | 92.2 | 0.0224 | 89.7 | 72-119 | | 2.7 | 20 | |
| 1,2-Dichloroethane | 0.0250 | 0.0216 | 86.3 | 0.0211 | 84.5 | 69-128 | | 2.1 | 20 | |
| Trichloroethene | 0.0250 | 0.0237 | 94.9 | 0.0233 | 93.0 | 69-131 | | 2.0 | 20 | |
| 1,2-Dichloropropane | 0.0250 | 0.0232 | 92.9 | 0.0229 | 91.7 | 77-121 | | 1.3 | 20 | |
| Dibromomethane | 0.0250 | 0.0234 | 93.6 | 0.0230 | 91.9 | 77-124 | | 1.9 | 20 | |
| Bromodichloromethane | 0.0250 | 0.0216 | 86.6 | 0.0212 | 84.6 | 75-127 | | 2.3 | 20 | |
| 2-Chloroethyl vinyl ether | 0.125 | 0.104 | 83.0 | 0.105 | 84.3 | 26-172 | | 1.5 | 22 | |
| cis-1,3-Dichloropropene | 0.0250 | 0.0230 | 92.0 | 0.0225 | 89.9 | 74-124 | | 2.4 | 20 | |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.119 | 94.9 | 0.123 | 98.3 | 58-147 | | 3.6 | 20 | |
| Toluene | 0.0250 | 0.0226 | 90.6 | 0.0220 | 88.1 | 75-114 | | 2.8 | 20 | |
| trans-1,3-Dichloropropene | 0.0250 | 0.0239 | 95.7 | 0.0237 | 94.6 | 69-124 | | 1.1 | 20 | |
| 1,1,2-Trichloroethane | 0.0250 | 0.0232 | 92.8 | 0.0228 | 91.3 | 81-121 | | 1.6 | 20 | |

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# Quality Control Summary
## SDG: L638421
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/28/2013 **Analytic Batch: WG664054**
Analysis Date: 5/31/2013 Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11

### Laboratory Control Sample/ Laboratory Control Sample Duplicate

| Analyte | Spike | LCS | % Rec | LCSD | % Rec | Control Limits | Qualifier | % RPD | Control Limits | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 0.0250 | 0.0239 | 95.6 | 0.0228 | 91.3 | 69-131 | | 4.5 | 20 | |
| 1,3-Dichloropropane | 0.0250 | 0.0224 | 89.4 | 0.0222 | 88.8 | 78-117 | | 0.7 | 20 | |
| Chlorodibromomethane | 0.0250 | 0.0226 | 90.4 | 0.0222 | 88.8 | 73-128 | | 1.8 | 20 | |
| 1,2-Dibromoethane | 0.0250 | 0.0231 | 92.4 | 0.0227 | 90.9 | 78-124 | | 1.6 | 20 | |
| Chlorobenzene | 0.0250 | 0.0231 | 92.6 | 0.0226 | 90.2 | 78-123 | | 2.6 | 20 | |
| 1,1,1,2-Tetrachloroethane | 0.0250 | 0.0239 | 95.5 | 0.0232 | 93.0 | 77-128 | | 2.6 | 20 | |
| Ethylbenzene | 0.0250 | 0.0234 | 93.7 | 0.0225 | 89.8 | 77-124 | | 4.2 | 20 | |
| m&p-Xylene | 0.0500 | 0.0465 | 92.9 | 0.0442 | 88.3 | 76-123 | | 5.1 | 20 | |
| o-Xylene | 0.0250 | 0.0230 | 92.0 | 0.0221 | 88.3 | 77-125 | | 4.2 | 20 | |
| Styrene | 0.0250 | 0.0244 | 97.6 | 0.0237 | 94.8 | 69-145 | | 3.0 | 20 | |
| Bromoform | 0.0250 | 0.0240 | 96.0 | 0.0238 | 95.1 | 61-136 | | 0.9 | 20 | |
| Isopropylbenzene | 0.0250 | 0.0249 | 99.8 | 0.0242 | 97.0 | 74-126 | | 2.8 | 20 | |
| Bromobenzene | 0.0250 | 0.0215 | 86.2 | 0.0207 | 82.9 | 76-121 | | 3.8 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0221 | 88.3 | 0.0219 | 87.6 | 78-130 | | 0.8 | 20 | |
| 1,2,3-Trichloropropane | 0.0250 | 0.0216 | 86.2 | 0.0220 | 87.9 | 68-130 | | 1.9 | 20 | |
| n-Propylbenzene | 0.0250 | 0.0231 | 92.4 | 0.0220 | 88.0 | 77-125 | | 4.9 | 20 | |
| 2-Chlorotoluene | 0.0250 | 0.0225 | 90.0 | 0.0217 | 86.9 | 78-123 | | 3.5 | 20 | |
| 4-Chlorotoluene | 0.0250 | 0.0215 | 86.0 | 0.0209 | 83.7 | 78-122 | | 2.7 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0228 | 91.3 | 0.0219 | 87.5 | 78-127 | | 4.4 | 20 | |
| tert-Butylbenzene | 0.0250 | 0.0231 | 92.6 | 0.0223 | 89.3 | 76-131 | | 3.6 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0222 | 88.8 | 0.0214 | 85.8 | 77-129 | | 3.4 | 20 | |
| sec-Butylbenzene | 0.0250 | 0.0231 | 92.3 | 0.0221 | 88.4 | 77-130 | | 4.3 | 20 | |
| 1,3-Dichlorobenzene | 0.0250 | 0.0221 | 88.4 | 0.0218 | 87.1 | 77-127 | | 1.5 | 20 | |
| p-Isopropyltoluene | 0.0250 | 0.0240 | 95.9 | 0.0229 | 91.7 | 77-132 | | 4.4 | 20 | |
| 1,4-Dichlorobenzene | 0.0250 | 0.0229 | 91.6 | 0.0220 | 88.0 | 79-117 | | 3.9 | 20 | |
| 1,2,3-Trimethylbenzene | 0.0250 | 0.0210 | 84.1 | 0.0205 | 82.1 | 77-126 | | 2.4 | 20 | |
| 1,2-Dichlorobenzene | 0.0250 | 0.0225 | 90.1 | 0.0223 | 89.0 | 82-121 | | 1.2 | 20 | |
| n-Butylbenzene | 0.0250 | 0.0230 | 91.9 | 0.0217 | 86.9 | 74-130 | | 5.6 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0250 | 0.0240 | 96.2 | 0.0244 | 97.6 | 55-142 | | 1.5 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0250 | 0.0248 | 99.3 | 0.0246 | 98.5 | 76-127 | | 0.9 | 20 | |
| Hexachloro-1,3-butadiene | 0.0250 | 0.0233 | 93.3 | 0.0227 | 91.0 | 71-134 | | 2.5 | 20 | |
| Naphthalene | 0.0250 | 0.0224 | 89.8 | 0.0228 | 91.2 | 70-134 | | 1.5 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0250 | 0.0240 | 96.1 | 0.0236 | 94.4 | 77-130 | | 1.8 | 20 | |

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# Quality Control Summary
## SDG: L638421
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/28/2013 **Analytic Batch: WG664054**
Analysis Date: 5/31/2013 Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638421-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11

### Internal Standard Response and Retention Time Summary

FileID:0531_02.D Date:5/30/2013 Time:11:12 PM

| | IS1 | | IS2 | | IS3 | | IS4 | |
|---|---|---|---|---|---|---|---|---|
| | Response | RT | Response | RT | Response | RT | Response | RT |
| 12 Hour Std | 174521 | 4.32 | 283295 | 4.65 | 43467 | 5.81 | 127704 | 8.2 |
| Upper Limit | 349042 | 4.82 | 566590 | 5.15 | 86934 | 6.31 | 255408 | 8.7 |
| Lower Limit | 87260.5 | 3.82 | 141647.5 | 4.15 | 21733.5 | 5.31 | 63852 | 7.7 |
| Sample ID | Response | RT | Response | RT | Response | RT | Response | RT |
| Blank WG664054 | 171007 | 4.32 | 274636 | 4.65 | 40485 | 5.81 | 119138 | 8.2 |
| L638421-01 | 166917 | 4.32 | 268714 | 4.65 | 40838 | 5.81 | 115333 | 8.2 |
| L638421-02 | 168938 | 4.32 | 279381 | 4.65 | 42023 | 5.81 | 121156 | 8.2 |
| L638421-03 | 165291 | 4.32 | 267565 | 4.65 | 40017 | 5.81 | 119418 | 8.2 |
| L638421-04 | 163400 | 4.32 | 265498 | 4.65 | 40240 | 5.81 | 116159 | 8.2 |
| L638421-05 | 165636 | 4.32 | 266720 | 4.65 | 42322 | 5.81 | 115341 | 8.2 |
| L638421-06 | 164129 | 4.32 | 267286 | 4.65 | 40788 | 5.81 | 114911 | 8.2 |
| L638421-07 | 162314 | 4.32 | 264512 | 4.65 | 40772 | 5.81 | 115484 | 8.2 |
| L638421-08 | 160601 | 4.32 | 260971 | 4.65 | 39628 | 5.81 | 113554 | 8.2 |
| L638421-09 | 166395 | 4.32 | 270748 | 4.65 | 41009 | 5.81 | 117263 | 8.2 |
| L638421-10 | 163331 | 4.32 | 265161 | 4.65 | 41847 | 5.81 | 115637 | 8.2 |
| L638421-11 | 163781 | 4.32 | 266736 | 4.65 | 41212 | 5.81 | 114256 | 8.2 |
| LCS WG664054 | 166038 | 4.32 | 268098 | 4.64 | 40396 | 5.81 | 115714 | 8.2 |
| LCSD WG664054 | 168691 | 4.32 | 274928 | 4.65 | 42090 | 5.81 | 120600 | 8.2 |
| MS WG664054 | 171802 | 4.32 | 277682 | 4.64 | 42129 | 5.81 | 122068 | 8.2 |
| MSD WG664054 | 171676 | 4.32 | 281963 | 4.65 | 42413 | 5.81 | 121727 | 8.2 |

# PES Environmental, Inc. -WA
1215 4th Ave. Suite 1350
Seattle, WA 98161

Billing Information:
attn: Account Payable
1215 4th Avenue, Suite 1350
Seattle, WA 98161

Report to: Kelly Rankich
Email to: krankich@pesenv.com

Project Description: Manhattan Village
City/State Collected: Normandy Park, WA

Phone: (206)539-3980
FAX: (206)529-3985

Client Project #: 1358.001.01.003
ESC Key:

Collected by: Karsten Springstead
Site/Facility ID#:
P.O.#:

Collected by (signature):
Immediately Packed on Ice N (Y)

**Rush?** ( Lab MUST Be Notified )
____ Same Day.....200%
____ Next Day.....100%
____ Two Day.....50%
____ Three Day.....25%

**Date Results Needed:**
Email? __No ✓Yes
FAX? __No __Yes

Analysis/Container/Preservative
V8260 40mlAmb-HCl

Chain of Custody Page 1 of 2

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Phone (615) 758-5858
Fax (615) 758-5859

D033

CoCode (lab use only)
Template/Prelogin 188855
Shipped Via:

| Sample ID | Comp/Grab | Matrix* | Depth | Date | Time | No. of Cntrs | V8260 40mlAmb-HCl | Remarks/Contaminant | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|
| MW-12 | Grab | GW | 43 | 5-28-13 | 1415 | 2 | x | | L638421-01 |
| MW-15 | Grab | GW | 40 | 5-28-13 | 1600 | 2 | x | | 02 |
| EQ-1 | Grab | GW | | 5-28-13 | 1615 | 2 | x | | 03 |
| MW-13 | Grab | GW | 40 | 5-29-13 | 830 | 2 | x | | 04 |
| MW-14 | Grab | GW | 33 | 5-29-13 | 945 | 2 | x | | 05 |
| DC-5 | Grab | GW | 42.5 | 5-29-13 | 1045 | 2 | x | | 06 |
| MW-10 | Grab | GW | 37 | 5-29-13 | 1145 | 2 | x | | 07 |
| MW-3 | Grab | GW | 41 | 5-29-13 | 1245 | 2 | x | | 08 |
| MW-4 | Grab | GW | 39 | 5-29-13 | 1400 | 2 | x | | 09 |

*Matrix: **SS** - Soil/Solid **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Remarks:

5547023432080 Flow _____ Other _____

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| | 5-29-13 | 1700 | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
| | | | |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) |
| | | | |

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 3.7°C
Bottles Received: 22 VP
Date: 5/30/13
Time: 0930

Condition: TL (lab use only)
CoC Seals Intact: ____ Y ____ N ____ NA
pH Checked:
NCF:

# PES Environmental, Inc. -WA
# 1215 4th Ave. Suite 1350
# Seattle, WA 98161

Billing Information:
attn: Account Payable
1215 4th Avenue, Suite 1350
Seattle, WA 98161

Report to: Kelly Rankich

Email to: krankich@pesenv.com

Project Description: Manhattan Village

City/State Collected: Normandy Park, WA

Phone: (206)539-3980
FAX: (206)529-3985

Client Project #: 1358.001.01.003

ESC Key:

Collected by: Karsten Springstead

Site/Facility ID#:

P.O.#:

Collected by (signature):

Immediately Packed on Ice N (Y)

**Rush?** ( Lab MUST Be Notified )
____ Same Day.....200%
____ Next Day.....100%
____ Two Day.....50%
____ Three Day.....25%

**Date Results Needed:**

Email? __No ✓Yes

FAX? __No __Yes

Analysis/Container/Preservative

| Sample ID | Comp/Grab | Matrix* | Depth | Date | Time | No. of Cntrs | V8260 40mlAmb-HCl | Remarks/Contaminant | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|
| DC-14 | Grab | GW | 40 | 5-29-13 | 1500 | 2 | x | | L638711-10 |
| EQ-2 | Grab | GW | | 5-29-13 | 1530 | 2 | x | | -11 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
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Chain of Custody
Page 2 of 2

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Phone: (615) 758-5858
Fax: (615) 758-5859

CoCode (lab use only)

Template/Prelogin 168655

Shipped Via:

*Matrix: **SS** - Soil/Solid **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| | 5-29-13 | 1700 | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) |

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 3.7°C

Bottles Received: 22vp

Date: 5/30/13

Time: 0930

Condition: (lab use only) R

CoC Seals Intact: ____ Y ____ N ✓ NA

pH Checked:

NCF:

# MEMORANDUM

**TO:** Project File **DATE:** June 7, 2013

**FROM:** Jerry Harris

**SUBJECT:** Laboratory Data Validation Review

**PROJECT:** Manhattan Village

**PROJECT #:** 1325.003.01.003

**TASK:** May 28-29, 2013 Groundwater Samples

**LAB:** ECS Lab Sciences Request No. L638421

---

Nine groundwater samples were collected at the Manhattan Village site on May 28 and 29, 2013. In addition, two equipment rinsate blanks were collected in the field, shipped with the samples, and analyzed. The samples were analyzed for VOCs by USEPA Method 8260. One USEPA 8260 analysis lot (lot ID WG6640548130) was analyzed. Laboratory analytical services were provided by ECS Lab Sciences (ECS) of Mt. Juliet, Tennessee. ECS project number: L638421.

The quality assurance review of the laboratory data is summarized below.

## DATA QUALIFICATIONS

Guidelines established by USEPA for review of analytical data were used to validate the data. The comments presented in this memorandum refer to the laboratory's performance in meeting the quality control criteria outlined in the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA, 1999).

## DATA VALIDATION

### Completeness

All samples were collected and analyzed as requested. No concerns, issues, or anomalies were identified in the laboratory report.

### Sample Collection and Preservation

The samples were stored on ice in a cooler and delivered in good condition to the laboratory. The cooler temperature at the time of receipt was measured at 3.7 degrees Centigrade (°C). A temperature blank was not included in the cooler. The cooler temperature was within the recommended temperature preservation range of 4.0 +/- 2.0 °C. No data qualifications were warranted.

## Holding Times

The analyses for USEPA 8260 VOCs were performed within three days of sample collection. This is within the 14-day recommended holding time limit for water samples

No data were qualified based upon holding times.

## Initial Calibration

Hard copies of the initial calibration data for this project are not required in the data deliverable and are typically not reported. The laboratory is required to discuss discrepancies in initial calibration results associated with the project analyses if they occur. No initial calibration issues were reported; therefore no data qualifications were warranted.

## Continuing Calibration

Hard copies of the continuing calibration verification (CCV) data for this project are not required in the data deliverable and are typically not reported. The laboratory is required to discuss discrepancies in continuing calibration results associated with the project analyses if they occur. No initial calibration issues were reported; therefore no data qualifications were warranted.

## Method Blank Results

One laboratory method blank was analyzed with the single sample extraction lot. This meets the required frequency for analyzing method blanks for the USEPA 8260 analytical method. The method blank results did not report any compounds at concentrations at or above the MRLs. No data qualifications were warranted.

## Trip Blank Results

A trip blank was prepared and analyzed with the sample group. No target analytes were detected in the trip blank. No qualifications were warranted.

## Equipment Rinsate Blank Results

Two field equipment rinsate blanks were collected. The rinsate blanks were collected by running laboratory-provided pure water through the sample collection pump. The two rinsate samples were analyzed by USEPA Method 8260 with the project samples. No target analytes were detected in the rinsate blanks. No data qualifications were warranted.

## Field Duplicate Analyses

No field duplicates were required or collected during this sampling event.

## Laboratory Duplicate Analyses

A laboratory control sample (LCS) duplicate and a matrix spike (MS) duplicate were prepared and analyzed with the sample group. This meets the requirements of the method. The duplicate results are discussed in the LCS and MS sections below.

## Surrogate Recoveries

The surrogate percent recovery (%R) results for the USEPA 8260 samples, method blank, matrix spike, laboratory control sample and duplicates were within the laboratory surrogate control limits. No data qualifications were warranted.

## Laboratory Control Samples

One LCS was analyzed with the USEPA 8260 analytical group. The LCS was analyzed at the appropriate frequency for this project. The LCS recovery results for all control compounds met the %R acceptance criteria. In addition, a LCS duplicate was prepared and analyzed. The LCS duplicate %Rs and the LCS-LCS duplicate relative percent differences (RPDs) were within the laboratory control limits. No data qualifications were warranted.

## Matrix Spike/Matrix Spike Duplicates

A MS was prepared from primary sample MW-12 and analyzed with the USEPA 8260 method sample group. This meets the USEPA method requirements. A MS duplicate (MSD) was also prepared and analyzed. The %Rs for all spiked compounds in the MS and MSD were within the laboratory control limits except for 2-chloroethyl-vinyl-ether and acrolein. For 2-chloroethyl-vinyl-ether, the %R was below the lower control limit. This compound was not detected in the project samples. The remaining laboratory quality control data for this compound was reviewed and no other potential quantitation issues were identified. Because the remaining quality control data for this compound was within control limits, and the laboratory instrumentation was able to detect 2-chloroethyl-vinyl-ether in the LCS and MS samples (after spiking), the MS %R exceedance is not considered sufficient cause to warrant qualification of the data. The MS-MSD RPD for 2-chloroethyl-vinyl-ether also exceeded the laboratory control limit. Because 2-chloroethyl-vinyl-ether was not detected in the project samples, this exceedance does not warrant qualification of the data.

For acrolein, the MS %R was above the upper control limit. This compound was not detected in the project samples. The remaining laboratory quality control data for this compound was reviewed and no other potential quantitation issues were identified. Because the remaining quality control data for this compound was within control limits, and the laboratory instrumentation was able to detect acrolein in the LCS and MS samples (after spiking), the MS %R exceedance is not considered sufficient cause to warrant qualification of the data. No qualifications were made based upon the MS and MSD results.

Based upon the above information, the MS and MSD exceedances in the batch samples are not considered sufficient cause to warrant qualification of the data. No qualifications were assigned.

## Other Quality Control Issues

No other laboratory quality control issues were identified in the laboratory report.

## Quantitation Limits

Results of the USEPA 8260 VOC analyses were reported based on laboratory MRLs. The MRLs indicate the minimum quantity of a target analyte that can be confidently determined by the reference method. The MRLs and MDLs were acceptable for the project; therefore, no data qualifications were warranted.

## Data Assessment

No data were qualified. All data are judged to be acceptable for their intended use.

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# Quality Control Summary
## SDG: L638813

**For: PES Environmental, Inc.- WA**
**Project: Manhattan Village**
**June 06, 2013**

## Sample Receiving and Handling

All sample aliquots were received at the correct temperature, in the proper containers, and with the appropriate preservatives. All method specified holding times were met.

### Volatile Organic Compounds by Method 8260B

**Laboratory Control Sample**

Samples L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, and -17 were analyzed in analytical batch WG664328. The laboratory control sample associated with these samples was within the laboratory control limits for all compounds.

Samples L638813-01, -02, -04, -09, -15, and -16 were analyzed in analytical batch WG664527. The laboratory control sample associated with these samples was within the laboratory control limits for all compounds.

**Matrix Spike/Matrix Spike Duplicate**

For analytical batch WG664328 matrix spike/matrix spike duplicate analysis was performed on sample L638809-21. The matrix spike recoveries were below laboratory control limits for 2-Chloroethyl vinyl ether. The spike recoveries for the remaining target compounds were within limits. The relative percent difference exceeded laboratory limits for 2-Chloroethyl vinyl ether.

For analytical batch WG664527 matrix spike/matrix spike duplicate analysis was performed on sample L638809-22. The matrix spike recoveries were above laboratory control limits for Acrolein. The matrix spike recoveries were below laboratory control limits for Acetone and 2-Chloroethyl vinyl ether. The spike recoveries for the remaining target compounds were within limits. The relative percent difference exceeded laboratory limits for 2-Chloroethyl vinyl ether.

**Blank Analysis**

The method blank, the initial, and all continuing calibration blanks contained no analytes at concentrations above the method reporting limit.

Nancy F. McLain
ESC Representative
ESC Lab Sciences

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Tax I.D. 62-0814289

Est. 1970

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

# Report Summary

Wednesday June 05, 2013

Report Number: L638813
Samples Received: 06/01/13
Client Project: 1358.001.01.003

Description: Manhattan Village

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Jarred Willis , ESC Representative

*Laboratory Certification Numbers*

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-01

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-8 40 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 09:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/04/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-01

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-8 40 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 09:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Tetrachloroethene | 11. | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/04/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 97.4 | | % Rec. | 8260B | 06/04/13 | 1 |
| Dibromofluoromethane | 99.7 | | % Rec. | 8260B | 06/04/13 | 1 |
| 4-Bromofluorobenzene | 94.3 | | % Rec. | 8260B | 06/04/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-02

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : MW-2 38 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 10:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/04/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-02

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : MW-2 38 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 10:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Tetrachloroethene | 2.4 | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/04/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 100. | | % Rec. | 8260B | 06/04/13 | 1 |
| Dibromofluoromethane | 98.1 | | % Rec. | 8260B | 06/04/13 | 1 |
| 4-Bromofluorobenzene | 99.0 | | % Rec. | 8260B | 06/04/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-03

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-13 39 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 11:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-03

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-13 39 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 11:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Tetrachloroethene | 1.7 | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/03/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 106. | | % Rec. | 8260B | 06/03/13 | 1 |
| Dibromofluoromethane | 103. | | % Rec. | 8260B | 06/03/13 | 1 |
| 4-Bromofluorobenzene | 100. | | % Rec. | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-04

Date Received : June 01, 2013
Description : Manhattan Village

Site ID :

Sample ID : DC-12 40 FT

Project # : 1358.001.01.003

Collected By : Karsten Springstead
Collection Date : 05/30/13 12:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/04/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-04

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-12 40 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 12:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Tetrachloroethene | 2.3 | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/04/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 98.6 | | % Rec. | 8260B | 06/04/13 | 1 |
| Dibromofluoromethane | 98.1 | | % Rec. | 8260B | 06/04/13 | 1 |
| 4-Bromofluorobenzene | 97.5 | | % Rec. | 8260B | 06/04/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-05

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-18 39 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 13:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-05

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-18 39 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 13:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Tetrachloroethene | 4.8 | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/03/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 103. | | % Rec. | 8260B | 06/03/13 | 1 |
| Dibromofluoromethane | 103. | | % Rec. | 8260B | 06/03/13 | 1 |
| 4-Bromofluorobenzene | 101. | | % Rec. | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-06

Date Received : June 01, 2013
Description : Manhattan Village

Site ID :

Sample ID : DC-20 40 FT

Project # : 1358.001.01.003

Collected By : Karsten Springstead
Collection Date : 05/30/13 14:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-06

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-20 40 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 14:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Tetrachloroethene | 1.7 | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/03/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 104. | | % Rec. | 8260B | 06/03/13 | 1 |
| Dibromofluoromethane | 102. | | % Rec. | 8260B | 06/03/13 | 1 |
| 4-Bromofluorobenzene | 102. | | % Rec. | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-07

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-4 49 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 15:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-07

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-4 49 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 15:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Tetrachloroethene | 11. | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/03/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 103. | | % Rec. | 8260B | 06/03/13 | 1 |
| Dibromofluoromethane | 104. | | % Rec. | 8260B | 06/03/13 | 1 |
| 4-Bromofluorobenzene | 99.6 | | % Rec. | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-08

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-7 37.5 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 16:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-08

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-7 37.5 FT

Collected By : Karsten Springstead
Collection Date : 05/30/13 16:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Tetrachloroethene | 15. | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/03/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 103. | | % Rec. | 8260B | 06/03/13 | 1 |
| Dibromofluoromethane | 103. | | % Rec. | 8260B | 06/03/13 | 1 |
| 4-Bromofluorobenzene | 100. | | % Rec. | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-09

Date Received : June 01, 2013
Description : Manhattan Village

Site ID :

Sample ID : EQ-3

Project # : 1358.001.01.003

Collected By : Karsten Springstead
Collection Date : 05/30/13 16:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/04/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-09

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : EQ-3

Collected By : Karsten Springstead
Collection Date : 05/30/13 16:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/04/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 101. | | % Rec. | 8260B | 06/04/13 | 1 |
| Dibromofluoromethane | 98.3 | | % Rec. | 8260B | 06/04/13 | 1 |
| 4-Bromofluorobenzene | 95.8 | | % Rec. | 8260B | 06/04/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-10

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : MW-11 37 FT

Collected By : Karsten Springstead
Collection Date : 05/31/13 08:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : MW-11 37 FT

Collected By : Karsten Springstead
Collection Date : 05/31/13 08:15

ESC Sample # : L638813-10

Site ID :

Project # : 1358.001.01.003

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Tetrachloroethene | 22. | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/03/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 104. | | % Rec. | 8260B | 06/03/13 | 1 |
| Dibromofluoromethane | 103. | | % Rec. | 8260B | 06/03/13 | 1 |
| 4-Bromofluorobenzene | 99.1 | | % Rec. | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-11

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : MW-16 39.5 FT

Collected By : Karsten Springstead
Collection Date : 05/31/13 09:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-11

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : MW-16 39.5 FT

Collected By : Karsten Springstead
Collection Date : 05/31/13 09:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Tetrachloroethene | 2.5 | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/03/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 104. | | % Rec. | 8260B | 06/03/13 | 1 |
| Dibromofluoromethane | 104. | | % Rec. | 8260B | 06/03/13 | 1 |
| 4-Bromofluorobenzene | 99.8 | | % Rec. | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-12

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-17 35 FT

Collected By : Karsten Springstead
Collection Date : 05/31/13 10:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-12

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-17 35 FT

Collected By : Karsten Springstead
Collection Date : 05/31/13 10:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Tetrachloroethene | 21. | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/03/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 104. | | % Rec. | 8260B | 06/03/13 | 1 |
| Dibromofluoromethane | 103. | | % Rec. | 8260B | 06/03/13 | 1 |
| 4-Bromofluorobenzene | 99.9 | | % Rec. | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-13

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : KMW-2 37 FT

Collected By : Karsten Springstead
Collection Date : 05/31/13 11:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : KMW-2 37 FT

Collected By : Karsten Springstead
Collection Date : 05/31/13 11:30

ESC Sample # : L638813-13

Site ID :

Project # : 1358.001.01.003

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Tetrachloroethene | 22. | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/03/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 105. | | % Rec. | 8260B | 06/03/13 | 1 |
| Dibromofluoromethane | 105. | | % Rec. | 8260B | 06/03/13 | 1 |
| 4-Bromofluorobenzene | 101. | | % Rec. | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-14

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-10A 37 FT

Collected By : Karsten Springstead
Collection Date : 05/31/13 13:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-14

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DC-10A 37 FT

Collected By : Karsten Springstead
Collection Date : 05/31/13 13:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Tetrachloroethene | 19. | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/03/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 105. | | % Rec. | 8260B | 06/03/13 | 1 |
| Dibromofluoromethane | 104. | | % Rec. | 8260B | 06/03/13 | 1 |
| 4-Bromofluorobenzene | 99.5 | | % Rec. | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-15

Date Received : June 01, 2013
Description : Manhattan Village

Site ID :

Sample ID : EQ-4

Project # : 1358.001.01.003

Collected By : Karsten Springstead
Collection Date : 05/31/13 13:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/04/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-15

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : EQ-4

Collected By : Karsten Springstead
Collection Date : 05/31/13 13:15

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/04/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 98.9 | | % Rec. | 8260B | 06/04/13 | 1 |
| Dibromofluoromethane | 102. | | % Rec. | 8260B | 06/04/13 | 1 |
| 4-Bromofluorobenzene | 98.2 | | % Rec. | 8260B | 06/04/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-16

Date Received : June 01, 2013
Description : Manhattan Village

Site ID :

Sample ID : TRIPBLANK

Project # : 1358.001.01.003

Collected By : Karsten Springstead
Collection Date : 05/31/13 00:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/04/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/04/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-16

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : TRIPBLANK

Collected By : Karsten Springstead
Collection Date : 05/31/13 00:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/04/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/04/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/04/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 98.9 | | % Rec. | 8260B | 06/04/13 | 1 |
| Dibromofluoromethane | 102. | | % Rec. | 8260B | 06/04/13 | 1 |
| 4-Bromofluorobenzene | 94.4 | | % Rec. | 8260B | 06/04/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-17

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DRUM-W

Collected By : Karsten Springstead
Collection Date : 05/31/13 13:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260B | 06/03/13 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| p-Isopropyltoluene | 7.0 | 1.0 | ug/l | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

June 05,2013

ESC Sample # : L638813-17

Site ID :

Project # : 1358.001.01.003

Date Received : June 01, 2013
Description : Manhattan Village

Sample ID : DRUM-W

Collected By : Karsten Springstead
Collection Date : 05/31/13 13:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260B | 06/03/13 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Tetrachloroethene | 3.3 | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260B | 06/03/13 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260B | 06/03/13 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 104. | | % Rec. | 8260B | 06/03/13 | 1 |
| Dibromofluoromethane | 104. | | % Rec. | 8260B | 06/03/13 | 1 |
| 4-Bromofluorobenzene | 99.1 | | % Rec. | 8260B | 06/03/13 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
This report shall not be reproduced, except in full, without the written approval from ESC.
.
Reported: 06/05/13 15:15 Printed: 06/05/13 16:12

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

| | | | |
|---|---|---|---|
| Test: | Volatile Organic Compounds by Method 8260B | | |
| Project No: | 1358.001.01.003 | Matrix: | Water - mg/L |
| Project: | Manhattan Village | EPA ID: | TN00003 |
| Collection Date: | 5/30/2013 | **Analytic Batch:** | **WG664328** |
| Analysis Date: | 6/3/2013 | Analyst: | 559 |
| Instrument ID: | VOCMS26 | | |
| Sample Numbers: | L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, -17 | | |

### Method Blank

| Analyte | CAS | PQL | Qualifiers |
|---|---|---|---|
| Dichlorodifluoromethane | 75-71-8 | <0.0050 | |
| Chloromethane | 74-87-3 | <0.0025 | |
| Vinyl chloride | 75-01-4 | <0.0010 | |
| Bromomethane | 74-83-9 | <0.0050 | |
| Chloroethane | 75-00-3 | <0.0050 | |
| Trichlorofluoromethane | 75-69-4 | <0.0050 | |
| Acrolein | 107-02-8 | <0.0250 | |
| 1,1-Dichloroethene | 75-35-4 | <0.0010 | |
| 1,1,2-Trichlorotrifluoroethane | 76-13-1 | <0.0010 | |
| Acetone | 67-64-1 | <0.0500 | |
| Methylene Chloride | 75-09-2 | <0.0050 | |
| Acrylonitrile | 107-13-1 | <0.0100 | |
| trans-1,2-Dichloroethene | 156-60-5 | <0.0010 | |
| Methyl tert-butyl ether | 1634-04-4 | <0.0010 | |
| 1,1-Dichloroethane | 75-34-3 | <0.0010 | |
| Di-isopropyl ether | 108-20-3 | <0.0010 | |
| 2,2-Dichloropropane | 594-20-7 | <0.0010 | |
| cis-1,2-Dichloroethene | 156-59-2 | <0.0010 | |
| 2-Butanone (MEK) | 78-93-3 | <0.0100 | |
| Chloroform | 67-66-3 | <0.0050 | |
| 1,1,1-Trichloroethane | 71-55-6 | <0.0010 | |
| Carbon tetrachloride | 56-23-5 | <0.0010 | |
| 1,1-Dichloropropene | 563-58-6 | <0.0010 | |
| Benzene | 71-43-2 | <0.0010 | |
| 1,2-Dichloroethane | 107-06-2 | <0.0010 | |
| Trichloroethene | 79-01-6 | <0.0010 | |
| 1,2-Dichloropropane | 78-87-5 | <0.0010 | |
| Dibromomethane | 74-95-3 | <0.0010 | |
| Bromodichloromethane | 75-27-4 | <0.0010 | |
| 2-Chloroethyl vinyl ether | 110-75-8 | <0.0500 | |
| cis-1,3-Dichloropropene | 10061-01-5 | <0.0010 | |
| 4-Methyl-2-pentanone (MIBK) | 108-10-1 | <0.0100 | |
| Toluene | 108-88-3 | <0.0050 | |
| trans-1,3-Dichloropropene | 10061-02-6 | <0.0010 | |
| 1,1,2-Trichloroethane | 79-00-5 | <0.0010 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

| | | | |
|---|---|---|---|
| Test: | Volatile Organic Compounds by Method 8260B | | |
| Project No: | 1358.001.01.003 | Matrix: | Water - mg/L |
| Project: | Manhattan Village | EPA ID: | TN00003 |
| Collection Date: | 5/30/2013 | **Analytic Batch:** | **WG664328** |
| Analysis Date: | 6/3/2013 | Analyst: | 559 |
| Instrument ID: | VOCMS26 | | |
| Sample Numbers: | L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, -17 | | |

### Method Blank

| Analyte | CAS | PQL | Qualifiers |
|---|---|---|---|
| Tetrachloroethene | 127-18-4 | <0.0010 | |
| 1,3-Dichloropropane | 142-28-9 | <0.0010 | |
| Chlorodibromomethane | 124-48-1 | <0.0010 | |
| 1,2-Dibromoethane | 106-93-4 | <0.0010 | |
| Chlorobenzene | 108-90-7 | <0.0010 | |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.0010 | |
| Ethylbenzene | 100-41-4 | <0.0010 | |
| m&p-Xylene | 1330-20-7 | <0.0030 | |
| o-Xylene | 1330-20-7 | <0.0030 | |
| Styrene | 100-42-5 | <0.0010 | |
| Bromoform | 75-25-2 | <0.0010 | |
| Isopropylbenzene | 98-82-8 | <0.0010 | |
| Bromobenzene | 108-86-1 | <0.0010 | |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.0010 | |
| 1,2,3-Trichloropropane | 96-18-4 | <0.0010 | |
| n-Propylbenzene | 103-65-1 | <0.0010 | |
| 2-Chlorotoluene | 95-49-8 | <0.0010 | |
| 4-Chlorotoluene | 106-43-4 | <0.0010 | |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.0010 | |
| tert-Butylbenzene | 98-06-6 | <0.0010 | |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.0010 | |
| sec-Butylbenzene | 135-98-8 | <0.0010 | |
| 1,3-Dichlorobenzene | 541-73-1 | <0.0010 | |
| p-Isopropyltoluene | 99-87-6 | <0.0010 | |
| 1,4-Dichlorobenzene | 106-46-7 | <0.0010 | |
| 1,2,3-Trimethylbenzene | 526-73-8 | <0.0010 | |
| 1,2-Dichlorobenzene | 95-50-1 | <0.0010 | |
| n-Butylbenzene | 104-51-8 | <0.0010 | |
| 1,2-Dibromo-3-Chloropropane | 96-12-8 | <0.0050 | |
| 1,2,4-Trichlorobenzene | 120-82-1 | <0.0010 | |
| Hexachloro-1,3-butadiene | 87-68-3 | <0.0010 | |
| Naphthalene | 91-20-3 | <0.0050 | |
| 1,2,3-Trichlorobenzene | 87-61-6 | <0.0010 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

| | | | |
|---|---|---|---|
| Test: | Volatile Organic Compounds by Method 8260B | | |
| Project No: | 1358.001.01.003 | Matrix: | Water - mg/L |
| Project: | Manhattan Village | EPA ID: | TN00003 |
| Collection Date: | 5/30/2013 | **Analytic Batch:** | **WG664527** |
| Analysis Date: | 6/4/2013 | Analyst: | 505 |
| Instrument ID: | VOCMS28 | | |
| Sample Numbers: | L638813-01, -02, -04, -09, -15, -16 | | |

### Method Blank

| Analyte | CAS | PQL | Qualifiers |
|---|---|---|---|
| Dichlorodifluoromethane | 75-71-8 | <0.0050 | |
| Chloromethane | 74-87-3 | <0.0025 | |
| Vinyl chloride | 75-01-4 | <0.0010 | |
| Bromomethane | 74-83-9 | <0.0050 | |
| Chloroethane | 75-00-3 | <0.0050 | |
| Trichlorofluoromethane | 75-69-4 | <0.0050 | |
| Acrolein | 107-02-8 | <0.0250 | |
| 1,1-Dichloroethene | 75-35-4 | <0.0010 | |
| 1,1,2-Trichlorotrifluoroethane | 76-13-1 | <0.0010 | |
| Acetone | 67-64-1 | <0.0500 | |
| Methylene Chloride | 75-09-2 | <0.0050 | |
| Acrylonitrile | 107-13-1 | <0.0100 | |
| trans-1,2-Dichloroethene | 156-60-5 | <0.0010 | |
| Methyl tert-butyl ether | 1634-04-4 | <0.0010 | |
| 1,1-Dichloroethane | 75-34-3 | <0.0010 | |
| Di-isopropyl ether | 108-20-3 | <0.0010 | |
| 2,2-Dichloropropane | 594-20-7 | <0.0010 | |
| cis-1,2-Dichloroethene | 156-59-2 | <0.0010 | |
| 2-Butanone (MEK) | 78-93-3 | <0.0100 | |
| Chloroform | 67-66-3 | <0.0050 | |
| 1,1,1-Trichloroethane | 71-55-6 | <0.0010 | |
| Carbon tetrachloride | 56-23-5 | <0.0010 | |
| 1,1-Dichloropropene | 563-58-6 | <0.0010 | |
| Benzene | 71-43-2 | <0.0010 | |
| 1,2-Dichloroethane | 107-06-2 | <0.0010 | |
| Trichloroethene | 79-01-6 | <0.0010 | |
| 1,2-Dichloropropane | 78-87-5 | <0.0010 | |
| Dibromomethane | 74-95-3 | <0.0010 | |
| Bromodichloromethane | 75-27-4 | <0.0010 | |
| 2-Chloroethyl vinyl ether | 110-75-8 | <0.0500 | |
| cis-1,3-Dichloropropene | 10061-01-5 | <0.0010 | |
| 4-Methyl-2-pentanone (MIBK) | 108-10-1 | <0.0100 | |
| Toluene | 108-88-3 | <0.0050 | |
| trans-1,3-Dichloropropene | 10061-02-6 | <0.0010 | |
| 1,1,2-Trichloroethane | 79-00-5 | <0.0010 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

| | | | |
|---|---|---|---|
| Test: | Volatile Organic Compounds by Method 8260B | | |
| Project No: | 1358.001.01.003 | Matrix: | Water - mg/L |
| Project: | Manhattan Village | EPA ID: | TN00003 |
| Collection Date: | 5/30/2013 | **Analytic Batch:** | **WG664527** |
| Analysis Date: | 6/4/2013 | Analyst: | 505 |
| Instrument ID: | VOCMS28 | | |
| Sample Numbers: | L638813-01, -02, -04, -09, -15, -16 | | |

### Method Blank

| Analyte | CAS | PQL | Qualifiers |
|---|---|---|---|
| Tetrachloroethene | 127-18-4 | <0.0010 | |
| 1,3-Dichloropropane | 142-28-9 | <0.0010 | |
| Chlorodibromomethane | 124-48-1 | <0.0010 | |
| 1,2-Dibromoethane | 106-93-4 | <0.0010 | |
| Chlorobenzene | 108-90-7 | <0.0010 | |
| 1,1,1,2-Tetrachloroethane | 630-20-6 | <0.0010 | |
| Ethylbenzene | 100-41-4 | <0.0010 | |
| m&p-Xylene | 1330-20-7 | <0.0030 | |
| o-Xylene | 1330-20-7 | <0.0030 | |
| Styrene | 100-42-5 | <0.0010 | |
| Bromoform | 75-25-2 | <0.0010 | |
| Isopropylbenzene | 98-82-8 | <0.0010 | |
| Bromobenzene | 108-86-1 | <0.0010 | |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.0010 | |
| 1,2,3-Trichloropropane | 96-18-4 | <0.0010 | |
| n-Propylbenzene | 103-65-1 | <0.0010 | |
| 2-Chlorotoluene | 95-49-8 | <0.0010 | |
| 4-Chlorotoluene | 106-43-4 | <0.0010 | |
| 1,3,5-Trimethylbenzene | 108-67-8 | <0.0010 | |
| tert-Butylbenzene | 98-06-6 | <0.0010 | |
| 1,2,4-Trimethylbenzene | 95-63-6 | <0.0010 | |
| sec-Butylbenzene | 135-98-8 | <0.0010 | |
| 1,3-Dichlorobenzene | 541-73-1 | <0.0010 | |
| p-Isopropyltoluene | 99-87-6 | <0.0010 | |
| 1,4-Dichlorobenzene | 106-46-7 | <0.0010 | |
| 1,2,3-Trimethylbenzene | 526-73-8 | <0.0010 | |
| 1,2-Dichlorobenzene | 95-50-1 | <0.0010 | |
| n-Butylbenzene | 104-51-8 | <0.0010 | |
| 1,2-Dibromo-3-Chloropropane | 96-12-8 | <0.0050 | |
| 1,2,4-Trichlorobenzene | 120-82-1 | <0.0010 | |
| Hexachloro-1,3-butadiene | 87-68-3 | <0.0010 | |
| Naphthalene | 91-20-3 | <0.0050 | |
| 1,2,3-Trichlorobenzene | 87-61-6 | <0.0010 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/30/2013 **Analytic Batch: WG664328**
Analysis Date: 6/3/2013 Analyst: 559
Instrument ID: VOCMS26
Sample Numbers: L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, -17

### Laboratory Control Sample (LCS)

| Analyte | True Value | Found | Recovery % | Control Limits | Qualifiers |
|---|---|---|---|---|---|
| Dichlorodifluoromethane | 0.0250 | 0.0212 | 84.8 | 33 - 173 | |
| Chloromethane | 0.0250 | 0.0249 | 99.5 | 50 - 141 | |
| Vinyl chloride | 0.0250 | 0.0256 | 102 | 55 - 142 | |
| Bromomethane | 0.0250 | 0.0223 | 89.0 | 42 - 172 | |
| Chloroethane | 0.0250 | 0.0229 | 91.4 | 52 - 164 | |
| Trichlorofluoromethane | 0.0250 | 0.0231 | 92.2 | 53 - 161 | |
| Acrolein | 0.125 | 0.124 | 99.3 | 10 - 181 | |
| 1,1-Dichloroethene | 0.0250 | 0.0262 | 105 | 54 - 134 | |
| 1,1,2-Trichlorotrifluoroethane | 0.0250 | 0.0274 | 110 | 53 - 143 | |
| Acetone | 0.125 | 0.129 | 103 | 49 - 153 | |
| Methylene Chloride | 0.0250 | 0.0253 | 101 | 67 - 122 | |
| Acrylonitrile | 0.125 | 0.110 | 87.6 | 53 - 153 | |
| trans-1,2-Dichloroethene | 0.0250 | 0.0242 | 96.8 | 63 - 127 | |
| Methyl tert-butyl ether | 0.0250 | 0.0222 | 88.9 | 67 - 127 | |
| 1,1-Dichloroethane | 0.0250 | 0.0262 | 105 | 73 - 123 | |
| Di-isopropyl ether | 0.0250 | 0.0259 | 104 | 66 - 129 | |
| 2,2-Dichloropropane | 0.0250 | 0.0212 | 84.8 | 63 - 130 | |
| cis-1,2-Dichloroethene | 0.0250 | 0.0244 | 97.6 | 75 - 121 | |
| 2-Butanone (MEK) | 0.125 | 0.130 | 104 | 58 - 144 | |
| Chloroform | 0.0250 | 0.0252 | 101 | 76 - 122 | |
| 1,1,1-Trichloroethane | 0.0250 | 0.0238 | 95.2 | 71 - 126 | |
| Carbon tetrachloride | 0.0250 | 0.0221 | 88.3 | 63 - 129 | |
| 1,1-Dichloropropene | 0.0250 | 0.0266 | 106 | 67 - 127 | |
| Benzene | 0.0250 | 0.0262 | 105 | 72 - 119 | |
| 1,2-Dichloroethane | 0.0250 | 0.0238 | 95.2 | 69 - 128 | |
| Trichloroethene | 0.0250 | 0.0243 | 97.1 | 69 - 131 | |
| 1,2-Dichloropropane | 0.0250 | 0.0251 | 100 | 77 - 121 | |
| Dibromomethane | 0.0250 | 0.0231 | 92.4 | 77 - 124 | |
| Bromodichloromethane | 0.0250 | 0.0228 | 91.2 | 75 - 127 | |
| 2-Chloroethyl vinyl ether | 0.125 | 0.0955 | 76.4 | 26 - 172 | |
| cis-1,3-Dichloropropene | 0.0250 | 0.0243 | 97.1 | 74 - 124 | |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.121 | 96.6 | 58 - 147 | |
| Toluene | 0.0250 | 0.0248 | 99.1 | 75 - 114 | |
| trans-1,3-Dichloropropene | 0.0250 | 0.0235 | 94.0 | 69 - 124 | |
| 1,1,2-Trichloroethane | 0.0250 | 0.0228 | 91.0 | 81 - 121 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

| | | | |
|---|---|---|---|
| Test: | Volatile Organic Compounds by Method 8260B | | |
| Project No: | 1358.001.01.003 | Matrix: | Water - mg/L |
| Project: | Manhattan Village | EPA ID: | TN00003 |
| Collection Date: | 5/30/2013 | **Analytic Batch:** | **WG664328** |
| Analysis Date: | 6/3/2013 | Analyst: | 559 |
| Instrument ID: | VOCMS26 | | |

Sample Numbers: L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, -17

### Laboratory Control Sample (LCS)

| Analyte | True Value | Found | Recovery % | Control Limits | Qualifiers |
|---|---|---|---|---|---|
| Tetrachloroethene | 0.0250 | 0.0237 | 94.6 | 69 - 131 | |
| 1,3-Dichloropropane | 0.0250 | 0.0240 | 96.1 | 78 - 117 | |
| Chlorodibromomethane | 0.0250 | 0.0221 | 88.4 | 73 - 128 | |
| 1,2-Dibromoethane | 0.0250 | 0.0233 | 93.0 | 78 - 124 | |
| Chlorobenzene | 0.0250 | 0.0239 | 95.4 | 78 - 123 | |
| 1,1,1,2-Tetrachloroethane | 0.0250 | 0.0228 | 91.3 | 77 - 128 | |
| Ethylbenzene | 0.0250 | 0.0242 | 97.0 | 77 - 124 | |
| m&p-Xylene | 0.0500 | 0.0482 | 96.3 | 76 - 123 | |
| o-Xylene | 0.0250 | 0.0237 | 95.0 | 77 - 125 | |
| Styrene | 0.0250 | 0.0240 | 96.1 | 69 - 145 | |
| Bromoform | 0.0250 | 0.0220 | 88.1 | 61 - 136 | |
| Isopropylbenzene | 0.0250 | 0.0257 | 103 | 74 - 126 | |
| Bromobenzene | 0.0250 | 0.0244 | 97.7 | 76 - 121 | |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0228 | 91.3 | 78 - 130 | |
| 1,2,3-Trichloropropane | 0.0250 | 0.0220 | 88.2 | 68 - 130 | |
| n-Propylbenzene | 0.0250 | 0.0253 | 101 | 77 - 125 | |
| 2-Chlorotoluene | 0.0250 | 0.0242 | 96.9 | 78 - 123 | |
| 4-Chlorotoluene | 0.0250 | 0.0245 | 98.0 | 78 - 122 | |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0244 | 97.5 | 78 - 127 | |
| tert-Butylbenzene | 0.0250 | 0.0240 | 96.2 | 76 - 131 | |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0239 | 95.8 | 77 - 129 | |
| sec-Butylbenzene | 0.0250 | 0.0247 | 99.0 | 77 - 130 | |
| 1,3-Dichlorobenzene | 0.0250 | 0.0243 | 97.2 | 77 - 127 | |
| p-Isopropyltoluene | 0.0250 | 0.0248 | 99.4 | 77 - 132 | |
| 1,4-Dichlorobenzene | 0.0250 | 0.0249 | 99.7 | 79 - 117 | |
| 1,2,3-Trimethylbenzene | 0.0250 | 0.0231 | 92.4 | 77 - 126 | |
| 1,2-Dichlorobenzene | 0.0250 | 0.0248 | 99.4 | 82 - 121 | |
| n-Butylbenzene | 0.0250 | 0.0267 | 107 | 74 - 130 | |
| 1,2-Dibromo-3-Chloropropane | 0.0250 | 0.0222 | 89.0 | 55 - 142 | |
| 1,2,4-Trichlorobenzene | 0.0250 | 0.0266 | 106 | 76 - 127 | |
| Hexachloro-1,3-butadiene | 0.0250 | 0.0242 | 96.7 | 71 - 134 | |
| Naphthalene | 0.0250 | 0.0234 | 93.5 | 70 - 134 | |
| 1,2,3-Trichlorobenzene | 0.0250 | 0.0252 | 101 | 77 - 130 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/30/2013 **Analytic Batch: WG664328**
Analysis Date: 6/3/2013 Analyst: 559
Instrument ID: VOCMS26
Sample Numbers: L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, -17

### Laboratory Control Sample Duplicate (LCSD)

| Analyte | True Value | Found | Recovery % | Control Limits | Qualifiers |
|---|---|---|---|---|---|
| Dichlorodifluoromethane | 0.0250 | 0.0190 | 76.0 | 33 - 173 | |
| Chloromethane | 0.0250 | 0.0222 | 88.7 | 50 - 141 | |
| Vinyl chloride | 0.0250 | 0.0229 | 91.8 | 55 - 142 | |
| Bromomethane | 0.0250 | 0.0203 | 81.4 | 42 - 172 | |
| Chloroethane | 0.0250 | 0.0205 | 81.9 | 52 - 164 | |
| Trichlorofluoromethane | 0.0250 | 0.0204 | 81.6 | 53 - 161 | |
| Acrolein | 0.125 | 0.112 | 89.6 | 10 - 181 | |
| 1,1-Dichloroethene | 0.0250 | 0.0230 | 92.2 | 54 - 134 | |
| 1,1,2-Trichlorotrifluoroethane | 0.0250 | 0.0248 | 99.2 | 53 - 143 | |
| Acetone | 0.125 | 0.114 | 91.0 | 49 - 153 | |
| Methylene Chloride | 0.0250 | 0.0227 | 90.6 | 67 - 122 | |
| Acrylonitrile | 0.125 | 0.100 | 80.1 | 53 - 153 | |
| trans-1,2-Dichloroethene | 0.0250 | 0.0218 | 87.2 | 63 - 127 | |
| Methyl tert-butyl ether | 0.0250 | 0.0210 | 83.8 | 67 - 127 | |
| 1,1-Dichloroethane | 0.0250 | 0.0233 | 93.2 | 73 - 123 | |
| Di-isopropyl ether | 0.0250 | 0.0234 | 93.5 | 66 - 129 | |
| 2,2-Dichloropropane | 0.0250 | 0.0201 | 80.5 | 63 - 130 | |
| cis-1,2-Dichloroethene | 0.0250 | 0.0220 | 88.1 | 75 - 121 | |
| 2-Butanone (MEK) | 0.125 | 0.116 | 92.6 | 58 - 144 | |
| Chloroform | 0.0250 | 0.0223 | 89.2 | 76 - 122 | |
| 1,1,1-Trichloroethane | 0.0250 | 0.0217 | 86.7 | 71 - 126 | |
| Carbon tetrachloride | 0.0250 | 0.0200 | 80.1 | 63 - 129 | |
| 1,1-Dichloropropene | 0.0250 | 0.0235 | 94.0 | 67 - 127 | |
| Benzene | 0.0250 | 0.0233 | 93.0 | 72 - 119 | |
| 1,2-Dichloroethane | 0.0250 | 0.0212 | 84.9 | 69 - 128 | |
| Trichloroethene | 0.0250 | 0.0214 | 85.5 | 69 - 131 | |
| 1,2-Dichloropropane | 0.0250 | 0.0224 | 89.7 | 77 - 121 | |
| Dibromomethane | 0.0250 | 0.0210 | 84.0 | 77 - 124 | |
| Bromodichloromethane | 0.0250 | 0.0203 | 81.1 | 75 - 127 | |
| 2-Chloroethyl vinyl ether | 0.125 | 0.0832 | 66.5 | 26 - 172 | |
| cis-1,3-Dichloropropene | 0.0250 | 0.0214 | 85.8 | 74 - 124 | |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.109 | 87.6 | 58 - 147 | |
| Toluene | 0.0250 | 0.0222 | 88.8 | 75 - 114 | |
| trans-1,3-Dichloropropene | 0.0250 | 0.0208 | 83.2 | 69 - 124 | |
| 1,1,2-Trichloroethane | 0.0250 | 0.0205 | 82.0 | 81 - 121 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/30/2013 **Analytic Batch: WG664328**
Analysis Date: 6/3/2013 Analyst: 559
Instrument ID: VOCMS26
Sample Numbers: L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, -17

### Laboratory Control Sample Duplicate (LCSD)

| Analyte | True Value | Found | Recovery % | Control Limits | Qualifiers |
|---|---|---|---|---|---|
| Tetrachloroethene | 0.0250 | 0.0209 | 83.7 | 69 - 131 | |
| 1,3-Dichloropropane | 0.0250 | 0.0215 | 85.9 | 78 - 117 | |
| Chlorodibromomethane | 0.0250 | 0.0196 | 78.5 | 73 - 128 | |
| 1,2-Dibromoethane | 0.0250 | 0.0208 | 83.3 | 78 - 124 | |
| Chlorobenzene | 0.0250 | 0.0213 | 85.1 | 78 - 123 | |
| 1,1,1,2-Tetrachloroethane | 0.0250 | 0.0204 | 81.8 | 77 - 128 | |
| Ethylbenzene | 0.0250 | 0.0216 | 86.3 | 77 - 124 | |
| m&p-Xylene | 0.0500 | 0.0426 | 85.2 | 76 - 123 | |
| o-Xylene | 0.0250 | 0.0211 | 84.2 | 77 - 125 | |
| Styrene | 0.0250 | 0.0212 | 85.0 | 69 - 145 | |
| Bromoform | 0.0250 | 0.0198 | 79.4 | 61 - 136 | |
| Isopropylbenzene | 0.0250 | 0.0230 | 91.9 | 74 - 126 | |
| Bromobenzene | 0.0250 | 0.0218 | 87.0 | 76 - 121 | |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0203 | 81.3 | 78 - 130 | |
| 1,2,3-Trichloropropane | 0.0250 | 0.0195 | 78.1 | 68 - 130 | |
| n-Propylbenzene | 0.0250 | 0.0224 | 89.7 | 77 - 125 | |
| 2-Chlorotoluene | 0.0250 | 0.0216 | 86.5 | 78 - 123 | |
| 4-Chlorotoluene | 0.0250 | 0.0217 | 86.8 | 78 - 122 | |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0218 | 87.4 | 78 - 127 | |
| tert-Butylbenzene | 0.0250 | 0.0214 | 85.8 | 76 - 131 | |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0212 | 84.9 | 77 - 129 | |
| sec-Butylbenzene | 0.0250 | 0.0222 | 88.7 | 77 - 130 | |
| 1,3-Dichlorobenzene | 0.0250 | 0.0217 | 86.7 | 77 - 127 | |
| p-Isopropyltoluene | 0.0250 | 0.0223 | 89.3 | 77 - 132 | |
| 1,4-Dichlorobenzene | 0.0250 | 0.0223 | 89.1 | 79 - 117 | |
| 1,2,3-Trimethylbenzene | 0.0250 | 0.0205 | 81.9 | 77 - 126 | |
| 1,2-Dichlorobenzene | 0.0250 | 0.0219 | 87.6 | 82 - 121 | |
| n-Butylbenzene | 0.0250 | 0.0239 | 95.5 | 74 - 130 | |
| 1,2-Dibromo-3-Chloropropane | 0.0250 | 0.0202 | 80.7 | 55 - 142 | |
| 1,2,4-Trichlorobenzene | 0.0250 | 0.0242 | 96.7 | 76 - 127 | |
| Hexachloro-1,3-butadiene | 0.0250 | 0.0212 | 84.8 | 71 - 134 | |
| Naphthalene | 0.0250 | 0.0211 | 84.3 | 70 - 134 | |
| 1,2,3-Trichlorobenzene | 0.0250 | 0.0231 | 92.2 | 77 - 130 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 — Matrix: Water - mg/L
Project: Manhattan Village — EPA ID: TN00003
Collection Date: 5/30/2013 — **Analytic Batch: WG664527**
Analysis Date: 6/4/2013 — Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638813-01, -02, -04, -09, -15, -16

### Laboratory Control Sample (LCS)

| Analyte | True Value | Found | Recovery % | Control Limits | Qualifiers |
|---|---|---|---|---|---|
| Dichlorodifluoromethane | 0.0250 | 0.0196 | 78.3 | 33 - 173 | |
| Chloromethane | 0.0250 | 0.0247 | 98.7 | 50 - 141 | |
| Vinyl chloride | 0.0250 | 0.0257 | 103 | 55 - 142 | |
| Bromomethane | 0.0250 | 0.0365 | 146 | 42 - 172 | |
| Chloroethane | 0.0250 | 0.0276 | 110 | 52 - 164 | |
| Trichlorofluoromethane | 0.0250 | 0.0252 | 101 | 53 - 161 | |
| Acrolein | 0.125 | 0.116 | 92.7 | 10 - 181 | |
| 1,1-Dichloroethene | 0.0250 | 0.0259 | 104 | 54 - 134 | |
| 1,1,2-Trichlorotrifluoroethane | 0.0250 | 0.0274 | 109 | 53 - 143 | |
| Acetone | 0.125 | 0.105 | 84.2 | 49 - 153 | |
| Methylene Chloride | 0.0250 | 0.0230 | 92.2 | 67 - 122 | |
| Acrylonitrile | 0.125 | 0.117 | 93.9 | 53 - 153 | |
| trans-1,2-Dichloroethene | 0.0250 | 0.0248 | 99.2 | 63 - 127 | |
| Methyl tert-butyl ether | 0.0250 | 0.0248 | 99.3 | 67 - 127 | |
| 1,1-Dichloroethane | 0.0250 | 0.0253 | 101 | 73 - 123 | |
| Di-isopropyl ether | 0.0250 | 0.0250 | 100 | 66 - 129 | |
| 2,2-Dichloropropane | 0.0250 | 0.0257 | 103 | 63 - 130 | |
| cis-1,2-Dichloroethene | 0.0250 | 0.0248 | 99.2 | 75 - 121 | |
| 2-Butanone (MEK) | 0.125 | 0.111 | 89.0 | 58 - 144 | |
| Chloroform | 0.0250 | 0.0245 | 98.2 | 76 - 122 | |
| 1,1,1-Trichloroethane | 0.0250 | 0.0247 | 98.8 | 71 - 126 | |
| Carbon tetrachloride | 0.0250 | 0.0245 | 97.9 | 63 - 129 | |
| 1,1-Dichloropropene | 0.0250 | 0.0253 | 101 | 67 - 127 | |
| Benzene | 0.0250 | 0.0246 | 98.5 | 72 - 119 | |
| 1,2-Dichloroethane | 0.0250 | 0.0237 | 94.8 | 69 - 128 | |
| Trichloroethene | 0.0250 | 0.0237 | 94.9 | 69 - 131 | |
| 1,2-Dichloropropane | 0.0250 | 0.0239 | 95.6 | 77 - 121 | |
| Dibromomethane | 0.0250 | 0.0238 | 95.3 | 77 - 124 | |
| Bromodichloromethane | 0.0250 | 0.0223 | 89.1 | 75 - 127 | |
| 2-Chloroethyl vinyl ether | 0.125 | 0.110 | 87.9 | 26 - 172 | |
| cis-1,3-Dichloropropene | 0.0250 | 0.0236 | 94.5 | 74 - 124 | |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.129 | 103 | 58 - 147 | |
| Toluene | 0.0250 | 0.0233 | 93.4 | 75 - 114 | |
| trans-1,3-Dichloropropene | 0.0250 | 0.0243 | 97.2 | 69 - 124 | |
| 1,1,2-Trichloroethane | 0.0250 | 0.0224 | 89.7 | 81 - 121 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 — Matrix: Water - mg/L
Project: Manhattan Village — EPA ID: TN00003
Collection Date: 5/30/2013 — **Analytic Batch: WG664527**
Analysis Date: 6/4/2013 — Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638813-01, -02, -04, -09, -15, -16

### Laboratory Control Sample (LCS)

| Analyte | True Value | Found | Recovery % | Control Limits | Qualifiers |
|---|---|---|---|---|---|
| Tetrachloroethene | 0.0250 | 0.0229 | 91.8 | 69 - 131 | |
| 1,3-Dichloropropane | 0.0250 | 0.0224 | 89.5 | 78 - 117 | |
| Chlorodibromomethane | 0.0250 | 0.0217 | 86.8 | 73 - 128 | |
| 1,2-Dibromoethane | 0.0250 | 0.0226 | 90.4 | 78 - 124 | |
| Chlorobenzene | 0.0250 | 0.0224 | 89.8 | 78 - 123 | |
| 1,1,1,2-Tetrachloroethane | 0.0250 | 0.0230 | 91.9 | 77 - 128 | |
| Ethylbenzene | 0.0250 | 0.0230 | 92.1 | 77 - 124 | |
| m&p-Xylene | 0.0500 | 0.0462 | 92.5 | 76 - 123 | |
| o-Xylene | 0.0250 | 0.0226 | 90.3 | 77 - 125 | |
| Styrene | 0.0250 | 0.0238 | 95.3 | 69 - 145 | |
| Bromoform | 0.0250 | 0.0235 | 94.1 | 61 - 136 | |
| Isopropylbenzene | 0.0250 | 0.0251 | 100 | 74 - 126 | |
| Bromobenzene | 0.0250 | 0.0215 | 86.2 | 76 - 121 | |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0230 | 92.0 | 78 - 130 | |
| 1,2,3-Trichloropropane | 0.0250 | 0.0227 | 91.0 | 68 - 130 | |
| n-Propylbenzene | 0.0250 | 0.0233 | 93.3 | 77 - 125 | |
| 2-Chlorotoluene | 0.0250 | 0.0223 | 89.0 | 78 - 123 | |
| 4-Chlorotoluene | 0.0250 | 0.0216 | 86.3 | 78 - 122 | |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0233 | 93.3 | 78 - 127 | |
| tert-Butylbenzene | 0.0250 | 0.0228 | 91.4 | 76 - 131 | |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0224 | 89.7 | 77 - 129 | |
| sec-Butylbenzene | 0.0250 | 0.0234 | 93.6 | 77 - 130 | |
| 1,3-Dichlorobenzene | 0.0250 | 0.0219 | 87.7 | 77 - 127 | |
| p-Isopropyltoluene | 0.0250 | 0.0239 | 95.7 | 77 - 132 | |
| 1,4-Dichlorobenzene | 0.0250 | 0.0221 | 88.5 | 79 - 117 | |
| 1,2,3-Trimethylbenzene | 0.0250 | 0.0211 | 84.3 | 77 - 126 | |
| 1,2-Dichlorobenzene | 0.0250 | 0.0220 | 87.8 | 82 - 121 | |
| n-Butylbenzene | 0.0250 | 0.0237 | 95.0 | 74 - 130 | |
| 1,2-Dibromo-3-Chloropropane | 0.0250 | 0.0235 | 94.2 | 55 - 142 | |
| 1,2,4-Trichlorobenzene | 0.0250 | 0.0248 | 99.4 | 76 - 127 | |
| Hexachloro-1,3-butadiene | 0.0250 | 0.0231 | 92.4 | 71 - 134 | |
| Naphthalene | 0.0250 | 0.0220 | 88.1 | 70 - 134 | |
| 1,2,3-Trichlorobenzene | 0.0250 | 0.0234 | 93.7 | 77 - 130 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 — Matrix: Water - mg/L
Project: Manhattan Village — EPA ID: TN00003
Collection Date: 5/30/2013 — **Analytic Batch: WG664527**
Analysis Date: 6/4/2013 — Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638813-01, -02, -04, -09, -15, -16

### Laboratory Control Sample Duplicate (LCSD)

| Analyte | True Value | Found | Recovery % | Control Limits | Qualifiers |
|---|---|---|---|---|---|
| Dichlorodifluoromethane | 0.0250 | 0.0191 | 76.6 | 33 - 173 | |
| Chloromethane | 0.0250 | 0.0247 | 98.7 | 50 - 141 | |
| Vinyl chloride | 0.0250 | 0.0250 | 100 | 55 - 142 | |
| Bromomethane | 0.0250 | 0.0368 | 147 | 42 - 172 | |
| Chloroethane | 0.0250 | 0.0267 | 107 | 52 - 164 | |
| Trichlorofluoromethane | 0.0250 | 0.0247 | 98.8 | 53 - 161 | |
| Acrolein | 0.125 | 0.108 | 86.1 | 10 - 181 | |
| 1,1-Dichloroethene | 0.0250 | 0.0264 | 106 | 54 - 134 | |
| 1,1,2-Trichlorotrifluoroethane | 0.0250 | 0.0267 | 107 | 53 - 143 | |
| Acetone | 0.125 | 0.107 | 85.4 | 49 - 153 | |
| Methylene Chloride | 0.0250 | 0.0229 | 91.7 | 67 - 122 | |
| Acrylonitrile | 0.125 | 0.118 | 94.2 | 53 - 153 | |
| trans-1,2-Dichloroethene | 0.0250 | 0.0244 | 97.7 | 63 - 127 | |
| Methyl tert-butyl ether | 0.0250 | 0.0248 | 99.4 | 67 - 127 | |
| 1,1-Dichloroethane | 0.0250 | 0.0252 | 101 | 73 - 123 | |
| Di-isopropyl ether | 0.0250 | 0.0252 | 101 | 66 - 129 | |
| 2,2-Dichloropropane | 0.0250 | 0.0257 | 103 | 63 - 130 | |
| cis-1,2-Dichloroethene | 0.0250 | 0.0247 | 98.8 | 75 - 121 | |
| 2-Butanone (MEK) | 0.125 | 0.114 | 91.6 | 58 - 144 | |
| Chloroform | 0.0250 | 0.0243 | 97.2 | 76 - 122 | |
| 1,1,1-Trichloroethane | 0.0250 | 0.0245 | 97.9 | 71 - 126 | |
| Carbon tetrachloride | 0.0250 | 0.0246 | 98.3 | 63 - 129 | |
| 1,1-Dichloropropene | 0.0250 | 0.0253 | 101 | 67 - 127 | |
| Benzene | 0.0250 | 0.0245 | 97.9 | 72 - 119 | |
| 1,2-Dichloroethane | 0.0250 | 0.0237 | 94.8 | 69 - 128 | |
| Trichloroethene | 0.0250 | 0.0244 | 97.5 | 69 - 131 | |
| 1,2-Dichloropropane | 0.0250 | 0.0242 | 96.6 | 77 - 121 | |
| Dibromomethane | 0.0250 | 0.0240 | 95.9 | 77 - 124 | |
| Bromodichloromethane | 0.0250 | 0.0222 | 88.9 | 75 - 127 | |
| 2-Chloroethyl vinyl ether | 0.125 | 0.108 | 86.6 | 26 - 172 | |
| cis-1,3-Dichloropropene | 0.0250 | 0.0238 | 95.0 | 74 - 124 | |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.130 | 104 | 58 - 147 | |
| Toluene | 0.0250 | 0.0233 | 93.1 | 75 - 114 | |
| trans-1,3-Dichloropropene | 0.0250 | 0.0237 | 94.9 | 69 - 124 | |
| 1,1,2-Trichloroethane | 0.0250 | 0.0225 | 90.0 | 81 - 121 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

| | | | |
|---|---|---|---|
| Test: | Volatile Organic Compounds by Method 8260B | | |
| Project No: | 1358.001.01.003 | Matrix: | Water - mg/L |
| Project: | Manhattan Village | EPA ID: | TN00003 |
| Collection Date: | 5/30/2013 | **Analytic Batch:** | **WG664527** |
| Analysis Date: | 6/4/2013 | Analyst: | 505 |
| Instrument ID: | VOCMS28 | | |
| Sample Numbers: | L638813-01, -02, -04, -09, -15, -16 | | |

### Laboratory Control Sample Duplicate (LCSD)

| Analyte | True Value | Found | Recovery % | Control Limits | Qualifiers |
|---|---|---|---|---|---|
| Tetrachloroethene | 0.0250 | 0.0229 | 91.8 | 69 - 131 | |
| 1,3-Dichloropropane | 0.0250 | 0.0219 | 87.8 | 78 - 117 | |
| Chlorodibromomethane | 0.0250 | 0.0217 | 86.6 | 73 - 128 | |
| 1,2-Dibromoethane | 0.0250 | 0.0223 | 89.3 | 78 - 124 | |
| Chlorobenzene | 0.0250 | 0.0223 | 89.2 | 78 - 123 | |
| 1,1,1,2-Tetrachloroethane | 0.0250 | 0.0232 | 92.7 | 77 - 128 | |
| Ethylbenzene | 0.0250 | 0.0229 | 91.7 | 77 - 124 | |
| m&p-Xylene | 0.0500 | 0.0449 | 89.7 | 76 - 123 | |
| o-Xylene | 0.0250 | 0.0228 | 91.3 | 77 - 125 | |
| Styrene | 0.0250 | 0.0234 | 93.7 | 69 - 145 | |
| Bromoform | 0.0250 | 0.0231 | 92.4 | 61 - 136 | |
| Isopropylbenzene | 0.0250 | 0.0246 | 98.3 | 74 - 126 | |
| Bromobenzene | 0.0250 | 0.0209 | 83.7 | 76 - 121 | |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0224 | 89.5 | 78 - 130 | |
| 1,2,3-Trichloropropane | 0.0250 | 0.0225 | 90.0 | 68 - 130 | |
| n-Propylbenzene | 0.0250 | 0.0230 | 92.0 | 77 - 125 | |
| 2-Chlorotoluene | 0.0250 | 0.0226 | 90.4 | 78 - 123 | |
| 4-Chlorotoluene | 0.0250 | 0.0214 | 85.7 | 78 - 122 | |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0229 | 91.8 | 78 - 127 | |
| tert-Butylbenzene | 0.0250 | 0.0230 | 92.1 | 76 - 131 | |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0223 | 89.0 | 77 - 129 | |
| sec-Butylbenzene | 0.0250 | 0.0231 | 92.3 | 77 - 130 | |
| 1,3-Dichlorobenzene | 0.0250 | 0.0220 | 88.0 | 77 - 127 | |
| p-Isopropyltoluene | 0.0250 | 0.0239 | 95.6 | 77 - 132 | |
| 1,4-Dichlorobenzene | 0.0250 | 0.0218 | 87.4 | 79 - 117 | |
| 1,2,3-Trimethylbenzene | 0.0250 | 0.0210 | 83.9 | 77 - 126 | |
| 1,2-Dichlorobenzene | 0.0250 | 0.0219 | 87.5 | 82 - 121 | |
| n-Butylbenzene | 0.0250 | 0.0233 | 93.3 | 74 - 130 | |
| 1,2-Dibromo-3-Chloropropane | 0.0250 | 0.0232 | 92.9 | 55 - 142 | |
| 1,2,4-Trichlorobenzene | 0.0250 | 0.0249 | 99.5 | 76 - 127 | |
| Hexachloro-1,3-butadiene | 0.0250 | 0.0225 | 90.2 | 71 - 134 | |
| Naphthalene | 0.0250 | 0.0226 | 90.4 | 70 - 134 | |
| 1,2,3-Trichlorobenzene | 0.0250 | 0.0233 | 93.1 | 77 - 130 | |

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Est. 1970

# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/30/2013 **Analytic Batch: WG664328**
Analysis Date: 6/3/2013 Analyst: 559
Instrument ID: VOCMS26
Sample Numbers: L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, -17

### Surrogate Summary

| Laboratory | Dibromofluoromethane | | Toluene-d8 | | 4-Bromofluorobenzene | | **Alternate Surrogate** a,a,a-Trifluorotoluene | |
|---|---|---|---|---|---|---|---|---|
| Sample ID | ppb | % Rec | ppb | % Rec | ppb | % Rec | ppb | % Rec |
| LCS WG664328 | 41.3 | 103 | 41.4 | 104 | 39.6 | 99.0 | 39.3 | 98.3 |
| LCSD WG664328 | 41.4 | 103 | 41.6 | 104 | 39.6 | 99.0 | 39.6 | 99.0 |
| MS WG664328 | 42.0 | 105 | 41.5 | 104 | 39.8 | 99.6 | 39.1 | 97.8 |
| MSD WG664328 | 42.0 | 105 | 40.9 | 102 | 39.4 | 98.6 | 38.8 | 97.1 |
| Blank WG664328 | 39.8 | 99.6 | 41.6 | 104 | 39.5 | 98.8 | 38.9 | 97.2 |
| L638813-03 | 41.2 | 103 | 42.4 | 106 | 40.1 | 100 | 39.6 | 99.1 |
| L638813-05 | 41.4 | 103 | 41.4 | 103 | 40.4 | 101 | 39.4 | 98.6 |
| L638813-06 | 40.9 | 102 | 41.5 | 104 | 40.6 | 102 | 39.4 | 98.6 |
| L638813-07 | 41.4 | 104 | 41.2 | 103 | 39.9 | 99.6 | 39.4 | 98.6 |
| L638813-08 | 41.3 | 103 | 41.4 | 103 | 40.0 | 100 | 39.6 | 98.9 |
| L638813-10 | 41.4 | 103 | 41.6 | 104 | 39.6 | 99.1 | 39.3 | 98.3 |
| L638813-11 | 41.6 | 104 | 41.7 | 104 | 39.9 | 99.8 | 39.7 | 99.2 |
| L638813-12 | 41.3 | 103 | 41.7 | 104 | 40.0 | 99.9 | 39.8 | 99.5 |
| L638813-13 | 41.9 | 105 | 41.8 | 105 | 40.3 | 101 | 39.7 | 99.3 |
| L638813-14 | 41.5 | 104 | 42.1 | 105 | 39.8 | 99.5 | 39.7 | 99.3 |
| L638813-17 | 41.7 | 104 | 41.7 | 104 | 39.6 | 99.1 | 39.7 | 99.2 |

| | | |
|---|---|---|
| Dibromofluoromethane | 40 ppb | 82 - 126 |
| Toluene - d8 | 40 ppb | 92 - 112 |
| 4-Bromofluorobenzene | 40 ppb | 82 - 120 |
| **Alternate Surrogate** | | |
| a,a,a-Trifluorotoluene | 40 ppb | 90 - 116 |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

| | | | |
|---|---|---|---|
| Test: | Volatile Organic Compounds by Method 8260B | | |
| Project No: | 1358.001.01.003 | Matrix: | Water - mg/L |
| Project: | Manhattan Village | EPA ID: | TN00003 |
| Collection Date: | 5/30/2013 | **Analytic Batch:** | **WG664527** |
| Analysis Date: | 6/4/2013 | Analyst: | 505 |
| Instrument ID: | VOCMS28 | | |
| Sample Numbers: | L638813-01, -02, -04, -09, -15, -16 | | |

### Surrogate Summary

| Laboratory | Dibromofluoromethane | | Toluene-d8 | | 4-Bromofluorobenzene | | **Alternate Surrogate** a,a,a-Trifluorotoluene | |
|---|---|---|---|---|---|---|---|---|
| Sample ID | ppb | % Rec | ppb | % Rec | ppb | % Rec | ppb | % Rec |
| LCS WG664527 | 41.3 | 103 | 39.5 | 98.7 | 37.6 | 94.0 | 40.0 | 100 |
| LCSD WG664527 | 40.6 | 101 | 39.3 | 98.4 | 37.0 | 92.5 | 40.4 | 101 |
| MS WG664527 | 39.5 | 98.8 | 39.4 | 98.5 | 34.3 | 85.7 | 40.3 | 101 |
| MSD WG664527 | 40.1 | 100 | 40.2 | 100 | 35.7 | 89.3 | 40.9 | 102 |
| Blank WG664527 | 41.5 | 104 | 38.9 | 97.3 | 37.1 | 92.9 | 40.5 | 101 |
| L638813-16 | 40.7 | 102 | 39.6 | 98.9 | 37.7 | 94.4 | 39.7 | 99.3 |
| L638813-09 | 39.3 | 98.3 | 40.3 | 101 | 38.3 | 95.8 | 40.9 | 102 |
| L638813-15 | 41.0 | 102 | 39.6 | 98.9 | 39.3 | 98.1 | 39.8 | 99.4 |
| L638813-01 | 39.9 | 99.7 | 39.0 | 97.4 | 37.7 | 94.3 | 39.5 | 98.7 |
| L638813-02 | 39.3 | 98.1 | 40.0 | 100 | 39.6 | 99.0 | 40.4 | 101 |
| L638813-04 | 39.2 | 98.1 | 39.4 | 98.6 | 39.0 | 97.5 | 39.9 | 99.8 |

| | | |
|---|---|---|
| Dibromofluoromethane | 40 ppb | 82 - 126 |
| Toluene - d8 | 40 ppb | 92 - 112 |
| 4-Bromofluorobenzene | 40 ppb | 82 - 120 |
| **Alternate Surrogate** | | |
| a,a,a-Trifluorotoluene | 40 ppb | 90 - 116 |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/30/2013 **Analytic Batch: WG664328**
Analysis Date: 6/3/2013 Analyst: 559
Instrument ID: VOCMS26
Sample Numbers: L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, -17

### Matrix Spike/Matrix Spike Duplicate

L638809-21

| Analyte | Spike Value | Sample | MS | % Rec | MSD | % Rec | Control Limits | % Rec Qualifier | % RPD | Control Limits | RPD Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | 0.0250 | 0.0000 | 0.0203 | 81.0 | 0.0213 | 85.0 | 16-188 | | 4.8 | 22 | |
| Chloromethane | 0.0250 | 0.0000 | 0.0238 | 95.1 | 0.0246 | 98.5 | 27-155 | | 3.5 | 20 | |
| Vinyl chloride | 0.0250 | 0.0000 | 0.0244 | 97.5 | 0.0255 | 102 | 32-159 | | 4.6 | 21 | |
| Bromomethane | 0.0250 | 0.0000 | 0.0214 | 85.5 | 0.0221 | 88.5 | 23-177 | | 3.5 | 21 | |
| Chloroethane | 0.0250 | 0.0000 | 0.0223 | 89.2 | 0.0230 | 91.8 | 32-177 | | 2.8 | 21 | |
| Trichlorofluoromethane | 0.0250 | 0.0000 | 0.0222 | 88.7 | 0.0230 | 92.0 | 35-177 | | 3.6 | 23 | |
| Acrolein | 0.125 | 0.0000 | 0.107 | 85.2 | 0.113 | 90.0 | 10-189 | | 5.5 | 30 | |
| 1,1-Dichloroethene | 0.0250 | 0.0000 | 0.0255 | 102 | 0.0266 | 106 | 32-152 | | 4.3 | 20 | |
| 1,1,2-Trichlorotrifluoroethane | 0.0250 | 0.0000 | 0.0265 | 106 | 0.0278 | 111 | 36-159 | | 5.1 | 21 | |
| Acetone | 0.125 | 0.0000 | 0.0612 | 49.0 | 0.0636 | 50.9 | 34-146 | | 3.8 | 22 | |
| Methylene Chloride | 0.0250 | 0.0000 | 0.0245 | 98.1 | 0.0258 | 103 | 52-130 | | 5.2 | 20 | |
| Acrylonitrile | 0.125 | 0.0000 | 0.114 | 91.0 | 0.122 | 97.4 | 49-162 | | 6.7 | 20 | |
| trans-1,2-Dichloroethene | 0.0250 | 0.0000 | 0.0234 | 93.6 | 0.0246 | 98.5 | 45-137 | | 5.1 | 20 | |
| Methyl tert-butyl ether | 0.0250 | 0.0000 | 0.0228 | 91.2 | 0.0239 | 95.7 | 55-136 | | 4.8 | 20 | |
| 1,1-Dichloroethane | 0.0250 | 0.0000 | 0.0254 | 102 | 0.0267 | 107 | 58-133 | | 5.2 | 20 | |
| Di-isopropyl ether | 0.0250 | 0.0000 | 0.0251 | 100 | 0.0267 | 107 | 58-133 | | 6.2 | 20 | |
| 2,2-Dichloropropane | 0.0250 | 0.0000 | 0.0213 | 85.3 | 0.0223 | 89.4 | 51-141 | | 4.7 | 20 | |
| cis-1,2-Dichloroethene | 0.0250 | 0.0000 | 0.0235 | 93.9 | 0.0251 | 100 | 54-137 | | 6.6 | 20 | |
| 2-Butanone (MEK) | 0.125 | 0.0000 | 0.0967 | 77.3 | 0.105 | 83.9 | 51-149 | | 8.2 | 22 | |
| Chloroform | 0.0250 | 0.0000 | 0.0245 | 98.0 | 0.0257 | 103 | 64-130 | | 4.9 | 20 | |
| 1,1,1-Trichloroethane | 0.0250 | 0.0042 | 0.0273 | 92.3 | 0.0281 | 95.8 | 58-137 | | 3.1 | 20 | |
| Carbon tetrachloride | 0.0250 | 0.0009 | 0.0219 | 84.2 | 0.0225 | 86.7 | 49-140 | | 2.8 | 20 | |
| 1,1-Dichloropropene | 0.0250 | 0.0000 | 0.0253 | 101 | 0.0268 | 107 | 50-140 | | 5.6 | 20 | |
| Benzene | 0.0250 | 0.0000 | 0.0253 | 101 | 0.0266 | 106 | 51-134 | | 5.2 | 20 | |
| 1,2-Dichloroethane | 0.0250 | 0.0000 | 0.0237 | 95.0 | 0.0249 | 99.6 | 59-135 | | 4.8 | 20 | |
| Trichloroethene | 0.0250 | 0.0000 | 0.0232 | 92.9 | 0.0246 | 98.5 | 40-155 | | 5.8 | 20 | |
| 1,2-Dichloropropane | 0.0250 | 0.0000 | 0.0244 | 97.7 | 0.0256 | 103 | 68-126 | | 4.9 | 20 | |
| Dibromomethane | 0.0250 | 0.0000 | 0.0231 | 92.6 | 0.0248 | 99.2 | 68-131 | | 6.9 | 20 | |
| Bromodichloromethane | 0.0250 | 0.0000 | 0.0225 | 90.0 | 0.0241 | 96.4 | 67-132 | | 6.9 | 20 | |
| 2-Chloroethyl vinyl ether | 0.125 | 0.0000 | 0.0337 | 27.0 | 0.0115 | 9.2 | 10-161 | J6 | 98 | 40 | J3 |
| cis-1,3-Dichloropropene | 0.0250 | 0.0000 | 0.0234 | 93.7 | 0.0249 | 99.6 | 63-127 | | 6.1 | 20 | |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.0000 | 0.123 | 98.3 | 0.131 | 105 | 53-154 | | 6.8 | 21 | |
| Toluene | 0.0250 | 0.0000 | 0.0242 | 96.6 | 0.0252 | 101 | 61-126 | | 4.2 | 20 | |
| trans-1,3-Dichloropropene | 0.0250 | 0.0008 | 0.0232 | 89.7 | 0.0246 | 95.2 | 59-130 | | 5.7 | 20 | |
| 1,1,2-Trichloroethane | 0.0250 | 0.0000 | 0.0226 | 90.5 | 0.0238 | 95.3 | 73-128 | | 5.1 | 20 | |
| Tetrachloroethene | 0.0250 | 0.0000 | 0.0224 | 89.8 | 0.0235 | 94.0 | 56-139 | | 4.5 | 20 | |
| 1,3-Dichloropropane | 0.0250 | 0.0000 | 0.0239 | 95.4 | 0.0252 | 101 | 70-122 | | 5.4 | 20 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/30/2013 **Analytic Batch: WG664328**
Analysis Date: 6/3/2013 Analyst: 559
Instrument ID: VOCMS26
Sample Numbers: L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, -17

### Matrix Spike/Matrix Spike Duplicate

L638809-21

| Analyte | Spike Value | Sample | MS | % Rec | MSD | % Rec | Control Limits | % Rec Qualifier | % RPD | Control Limits | RPD Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chlorodibromomethane | 0.0250 | 0.0000 | 0.0220 | 88.0 | 0.0228 | 91.0 | 68-130 | | 3.4 | 20 | |
| 1,2-Dibromoethane | 0.0250 | 0.0000 | 0.0232 | 93.0 | 0.0246 | 98.4 | 71-129 | | 5.7 | 20 | |
| Chlorobenzene | 0.0250 | 0.0000 | 0.0232 | 92.7 | 0.0245 | 98.0 | 69-126 | | 5.6 | 20 | |
| 1,1,1,2-Tetrachloroethane | 0.0250 | 0.0000 | 0.0223 | 89.4 | 0.0235 | 94.0 | 71-130 | | 5.0 | 20 | |
| Ethylbenzene | 0.0250 | 0.0000 | 0.0234 | 93.5 | 0.0244 | 97.8 | 64-135 | | 4.5 | 20 | |
| m&p-Xylene | 0.0500 | 0.0000 | 0.0466 | 93.2 | 0.0486 | 97.2 | 62-135 | | 4.2 | 20 | |
| o-Xylene | 0.0250 | 0.0000 | 0.0229 | 91.5 | 0.0241 | 96.3 | 63-135 | | 5.1 | 20 | |
| Styrene | 0.0250 | 0.0000 | 0.0233 | 93.0 | 0.0245 | 98.0 | 58-152 | | 5.2 | 20 | |
| Bromoform | 0.0250 | 0.0000 | 0.0225 | 89.8 | 0.0238 | 95.3 | 59-137 | | 5.9 | 20 | |
| Isopropylbenzene | 0.0250 | 0.0000 | 0.0249 | 99.6 | 0.0260 | 104 | 62-134 | | 4.1 | 20 | |
| Bromobenzene | 0.0250 | 0.0000 | 0.0238 | 95.0 | 0.0252 | 101 | 64-130 | | 5.8 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0000 | 0.0235 | 94.0 | 0.0244 | 97.8 | 64-149 | | 4.0 | 20 | |
| 1,2,3-Trichloropropane | 0.0250 | 0.0000 | 0.0225 | 90.0 | 0.0242 | 96.8 | 74-137 | | 7.2 | 20 | |
| n-Propylbenzene | 0.0250 | 0.0000 | 0.0247 | 98.7 | 0.0256 | 102 | 62-137 | | 3.6 | 20 | |
| 2-Chlorotoluene | 0.0250 | 0.0000 | 0.0234 | 93.6 | 0.0243 | 97.2 | 65-133 | | 3.8 | 20 | |
| 4-Chlorotoluene | 0.0250 | 0.0000 | 0.0241 | 96.4 | 0.0248 | 99.2 | 67-129 | | 2.9 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0000 | 0.0236 | 94.5 | 0.0247 | 98.8 | 67-136 | | 4.4 | 20 | |
| tert-Butylbenzene | 0.0250 | 0.0000 | 0.0235 | 94.1 | 0.0241 | 96.4 | 66-139 | | 2.4 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0000 | 0.0232 | 92.8 | 0.0241 | 96.6 | 62-141 | | 3.9 | 20 | |
| sec-Butylbenzene | 0.0250 | 0.0000 | 0.0240 | 95.9 | 0.0250 | 99.8 | 67-139 | | 4.0 | 20 | |
| 1,3-Dichlorobenzene | 0.0250 | 0.0000 | 0.0239 | 95.4 | 0.0246 | 98.5 | 69-131 | | 3.1 | 20 | |
| p-Isopropyltoluene | 0.0250 | 0.0000 | 0.0244 | 97.6 | 0.0252 | 101 | 64-142 | | 3.2 | 20 | |
| 1,4-Dichlorobenzene | 0.0250 | 0.0000 | 0.0243 | 97.3 | 0.0261 | 104 | 70-123 | | 7.0 | 20 | |
| 1,2,3-Trimethylbenzene | 0.0250 | 0.0000 | 0.0223 | 89.3 | 0.0237 | 94.6 | 67-133 | | 5.8 | 20 | |
| 1,2-Dichlorobenzene | 0.0250 | 0.0000 | 0.0240 | 96.1 | 0.0256 | 102 | 75-125 | | 6.5 | 20 | |
| n-Butylbenzene | 0.0250 | 0.0000 | 0.0258 | 103 | 0.0272 | 109 | 62-142 | | 5.3 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0250 | 0.0000 | 0.0235 | 94.0 | 0.0250 | 99.8 | 55-148 | | 6.0 | 22 | |
| 1,2,4-Trichlorobenzene | 0.0250 | 0.0000 | 0.0265 | 106 | 0.0281 | 112 | 67-133 | | 5.7 | 20 | |
| Hexachloro-1,3-butadiene | 0.0250 | 0.0000 | 0.0232 | 92.8 | 0.0242 | 96.8 | 64-140 | | 4.2 | 20 | |
| Naphthalene | 0.0250 | 0.0000 | 0.0237 | 94.9 | 0.0251 | 100 | 65-140 | | 5.7 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0250 | 0.0000 | 0.0251 | 101 | 0.0269 | 108 | 68-135 | | 6.9 | 20 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/30/2013 **Analytic Batch: WG664328**
Analysis Date: 6/3/2013 Analyst: 559
Instrument ID: VOCMS26
Sample Numbers: L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, -17

### Laboratory Control Sample/ Laboratory Control Sample Duplicate

| Analyte | Spike | LCS | % Rec | LCSD | % Rec | Control Limits | Qualifier | % RPD | Control Limits | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | 0.0250 | 0.0212 | 84.8 | 0.0190 | 76.0 | 33-173 | | 11 | 20 | |
| Chloromethane | 0.0250 | 0.0249 | 99.5 | 0.0222 | 88.7 | 50-141 | | 11 | 20 | |
| Vinyl chloride | 0.0250 | 0.0256 | 102 | 0.0229 | 91.8 | 55-142 | | 11 | 20 | |
| Bromomethane | 0.0250 | 0.0223 | 89.0 | 0.0203 | 81.4 | 42-172 | | 8.9 | 20 | |
| Chloroethane | 0.0250 | 0.0229 | 91.4 | 0.0205 | 81.9 | 52-164 | | 11 | 20 | |
| Trichlorofluoromethane | 0.0250 | 0.0231 | 92.2 | 0.0204 | 81.6 | 53-161 | | 12 | 20 | |
| Acrolein | 0.125 | 0.124 | 99.3 | 0.112 | 89.6 | 10-181 | | 10 | 30 | |
| 1,1-Dichloroethene | 0.0250 | 0.0262 | 105 | 0.0230 | 92.2 | 54-134 | | 13 | 20 | |
| 1,1,2-Trichlorotrifluoroethane | 0.0250 | 0.0274 | 110 | 0.0248 | 99.2 | 53-143 | | 9.9 | 20 | |
| Acetone | 0.125 | 0.129 | 103 | 0.114 | 91.0 | 49-153 | | 13 | 21 | |
| Methylene Chloride | 0.0250 | 0.0253 | 101 | 0.0227 | 90.6 | 67-122 | | 11 | 20 | |
| Acrylonitrile | 0.125 | 0.110 | 87.6 | 0.100 | 80.1 | 53-153 | | 9.1 | 20 | |
| trans-1,2-Dichloroethene | 0.0250 | 0.0242 | 96.8 | 0.0218 | 87.2 | 63-127 | | 10 | 20 | |
| Methyl tert-butyl ether | 0.0250 | 0.0222 | 88.9 | 0.0210 | 83.8 | 67-127 | | 5.9 | 20 | |
| 1,1-Dichloroethane | 0.0250 | 0.0262 | 105 | 0.0233 | 93.2 | 73-123 | | 12 | 20 | |
| Di-isopropyl ether | 0.0250 | 0.0259 | 104 | 0.0234 | 93.5 | 66-129 | | 10 | 20 | |
| 2,2-Dichloropropane | 0.0250 | 0.0212 | 84.8 | 0.0201 | 80.5 | 63-130 | | 5.3 | 20 | |
| cis-1,2-Dichloroethene | 0.0250 | 0.0244 | 97.6 | 0.0220 | 88.1 | 75-121 | | 10 | 20 | |
| 2-Butanone (MEK) | 0.125 | 0.130 | 104 | 0.116 | 92.6 | 58-144 | | 12 | 20 | |
| Chloroform | 0.0250 | 0.0252 | 101 | 0.0223 | 89.2 | 76-122 | | 12 | 20 | |
| 1,1,1-Trichloroethane | 0.0250 | 0.0238 | 95.2 | 0.0217 | 86.7 | 71-126 | | 9.2 | 20 | |
| Carbon tetrachloride | 0.0250 | 0.0221 | 88.3 | 0.0200 | 80.1 | 63-129 | | 9.7 | 20 | |
| 1,1-Dichloropropene | 0.0250 | 0.0266 | 106 | 0.0235 | 94.0 | 67-127 | | 12 | 20 | |
| Benzene | 0.0250 | 0.0262 | 105 | 0.0233 | 93.0 | 72-119 | | 12 | 20 | |
| 1,2-Dichloroethane | 0.0250 | 0.0238 | 95.2 | 0.0212 | 84.9 | 69-128 | | 11 | 20 | |
| Trichloroethene | 0.0250 | 0.0243 | 97.1 | 0.0214 | 85.5 | 69-131 | | 13 | 20 | |
| 1,2-Dichloropropane | 0.0250 | 0.0251 | 100 | 0.0224 | 89.7 | 77-121 | | 11 | 20 | |
| Dibromomethane | 0.0250 | 0.0231 | 92.4 | 0.0210 | 84.0 | 77-124 | | 9.6 | 20 | |
| Bromodichloromethane | 0.0250 | 0.0228 | 91.2 | 0.0203 | 81.1 | 75-127 | | 12 | 20 | |
| 2-Chloroethyl vinyl ether | 0.125 | 0.0955 | 76.4 | 0.0832 | 66.5 | 26-172 | | 14 | 22 | |
| cis-1,3-Dichloropropene | 0.0250 | 0.0243 | 97.1 | 0.0214 | 85.8 | 74-124 | | 12 | 20 | |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.121 | 96.6 | 0.109 | 87.6 | 58-147 | | 9.8 | 20 | |
| Toluene | 0.0250 | 0.0248 | 99.1 | 0.0222 | 88.8 | 75-114 | | 11 | 20 | |
| trans-1,3-Dichloropropene | 0.0250 | 0.0235 | 94.0 | 0.0208 | 83.2 | 69-124 | | 12 | 20 | |
| 1,1,2-Trichloroethane | 0.0250 | 0.0228 | 91.0 | 0.0205 | 82.0 | 81-121 | | 10 | 20 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/30/2013 **Analytic Batch: WG664328**
Analysis Date: 6/3/2013 Analyst: 559
Instrument ID: VOCMS26
Sample Numbers: L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, -17

### Laboratory Control Sample/ Laboratory Control Sample Duplicate

| Analyte | Spike | LCS | % Rec | LCSD | % Rec | Control Limits | Qualifier | % RPD | Control Limits | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 0.0250 | 0.0237 | 94.6 | 0.0209 | 83.7 | 69-131 | | 12 | 20 | |
| 1,3-Dichloropropane | 0.0250 | 0.0240 | 96.1 | 0.0215 | 85.9 | 78-117 | | 11 | 20 | |
| Chlorodibromomethane | 0.0250 | 0.0221 | 88.4 | 0.0196 | 78.5 | 73-128 | | 12 | 20 | |
| 1,2-Dibromoethane | 0.0250 | 0.0233 | 93.0 | 0.0208 | 83.3 | 78-124 | | 11 | 20 | |
| Chlorobenzene | 0.0250 | 0.0239 | 95.4 | 0.0213 | 85.1 | 78-123 | | 11 | 20 | |
| 1,1,1,2-Tetrachloroethane | 0.0250 | 0.0228 | 91.3 | 0.0204 | 81.8 | 77-128 | | 11 | 20 | |
| Ethylbenzene | 0.0250 | 0.0242 | 97.0 | 0.0216 | 86.3 | 77-124 | | 12 | 20 | |
| m&p-Xylene | 0.0500 | 0.0482 | 96.3 | 0.0426 | 85.2 | 76-123 | | 12 | 20 | |
| o-Xylene | 0.0250 | 0.0237 | 95.0 | 0.0211 | 84.2 | 77-125 | | 12 | 20 | |
| Styrene | 0.0250 | 0.0240 | 96.1 | 0.0212 | 85.0 | 69-145 | | 12 | 20 | |
| Bromoform | 0.0250 | 0.0220 | 88.1 | 0.0198 | 79.4 | 61-136 | | 10 | 20 | |
| Isopropylbenzene | 0.0250 | 0.0257 | 103 | 0.0230 | 91.9 | 74-126 | | 11 | 20 | |
| Bromobenzene | 0.0250 | 0.0244 | 97.7 | 0.0218 | 87.0 | 76-121 | | 12 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0228 | 91.3 | 0.0203 | 81.3 | 78-130 | | 12 | 20 | |
| 1,2,3-Trichloropropane | 0.0250 | 0.0220 | 88.2 | 0.0195 | 78.1 | 68-130 | | 12 | 20 | |
| n-Propylbenzene | 0.0250 | 0.0253 | 101 | 0.0224 | 89.7 | 77-125 | | 12 | 20 | |
| 2-Chlorotoluene | 0.0250 | 0.0242 | 96.9 | 0.0216 | 86.5 | 78-123 | | 11 | 20 | |
| 4-Chlorotoluene | 0.0250 | 0.0245 | 98.0 | 0.0217 | 86.8 | 78-122 | | 12 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0244 | 97.5 | 0.0218 | 87.4 | 78-127 | | 11 | 20 | |
| tert-Butylbenzene | 0.0250 | 0.0240 | 96.2 | 0.0214 | 85.8 | 76-131 | | 11 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0239 | 95.8 | 0.0212 | 84.9 | 77-129 | | 12 | 20 | |
| sec-Butylbenzene | 0.0250 | 0.0247 | 99.0 | 0.0222 | 88.7 | 77-130 | | 11 | 20 | |
| 1,3-Dichlorobenzene | 0.0250 | 0.0243 | 97.2 | 0.0217 | 86.7 | 77-127 | | 11 | 20 | |
| p-Isopropyltoluene | 0.0250 | 0.0248 | 99.4 | 0.0223 | 89.3 | 77-132 | | 11 | 20 | |
| 1,4-Dichlorobenzene | 0.0250 | 0.0249 | 99.7 | 0.0223 | 89.1 | 79-117 | | 11 | 20 | |
| 1,2,3-Trimethylbenzene | 0.0250 | 0.0231 | 92.4 | 0.0205 | 81.9 | 77-126 | | 12 | 20 | |
| 1,2-Dichlorobenzene | 0.0250 | 0.0248 | 99.4 | 0.0219 | 87.6 | 82-121 | | 13 | 20 | |
| n-Butylbenzene | 0.0250 | 0.0267 | 107 | 0.0239 | 95.5 | 74-130 | | 11 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0250 | 0.0222 | 89.0 | 0.0202 | 80.7 | 55-142 | | 9.7 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0250 | 0.0266 | 106 | 0.0242 | 96.7 | 76-127 | | 9.7 | 20 | |
| Hexachloro-1,3-butadiene | 0.0250 | 0.0242 | 96.7 | 0.0212 | 84.8 | 71-134 | | 13 | 20 | |
| Naphthalene | 0.0250 | 0.0234 | 93.5 | 0.0211 | 84.3 | 70-134 | | 10 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0250 | 0.0252 | 101 | 0.0231 | 92.2 | 77-130 | | 8.8 | 20 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 — Matrix: Water - mg/L
Project: Manhattan Village — EPA ID: TN00003
Collection Date: 5/30/2013 — **Analytic Batch: WG664527**
Analysis Date: 6/4/2013 — Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638813-01, -02, -04, -09, -15, -16

### Matrix Spike/Matrix Spike Duplicate

L638809-22

| Analyte | Spike Value | Sample | MS | % Rec | MSD | % Rec | Control Limits | % Rec Qualifier | % RPD | Control Limits | RPD Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | 0.0250 | 0.0000 | 0.0205 | 82.1 | 0.0200 | 79.8 | 16-188 | | 2.8 | 22 | |
| Chloromethane | 0.0250 | 0.0000 | 0.0246 | 98.3 | 0.0249 | 99.5 | 27-155 | | 1.2 | 20 | |
| Vinyl chloride | 0.0250 | 0.0000 | 0.0260 | 104 | 0.0255 | 102 | 32-159 | | 2.1 | 21 | |
| Bromomethane | 0.0250 | 0.0000 | 0.0356 | 142 | 0.0355 | 142 | 23-177 | | 0.2 | 21 | |
| Chloroethane | 0.0250 | 0.0000 | 0.0267 | 107 | 0.0268 | 107 | 32-177 | | 0.3 | 21 | |
| Trichlorofluoromethane | 0.0250 | 0.0000 | 0.0256 | 103 | 0.0253 | 101 | 35-177 | | 1.3 | 23 | |
| Acrolein | 0.125 | 0.305 | 0.835 | 425 | 0.828 | 418 | 10-189 | J5 | 0.9 | 30 | |
| 1,1-Dichloroethene | 0.0250 | 0.0000 | 0.0270 | 108 | 0.0271 | 108 | 32-152 | | 0.3 | 20 | |
| 1,1,2-Trichlorotrifluoroethane | 0.0250 | 0.0000 | 0.0278 | 111 | 0.0280 | 112 | 36-159 | | 0.7 | 21 | |
| Acetone | 0.125 | 0.0837 | 0.119 | 28.4 | 0.118 | 27.4 | 34-146 | J6 | 1.1 | 22 | |
| Methylene Chloride | 0.0250 | 0.0000 | 0.0220 | 88.1 | 0.0225 | 90.1 | 52-130 | | 2.2 | 20 | |
| Acrylonitrile | 0.125 | 0.0115 | 0.122 | 88.3 | 0.126 | 91.4 | 49-162 | | 3.1 | 20 | |
| trans-1,2-Dichloroethene | 0.0250 | 0.0000 | 0.0246 | 98.4 | 0.0246 | 98.4 | 45-137 | | 0.0 | 20 | |
| Methyl tert-butyl ether | 0.0250 | 0.0000 | 0.0234 | 93.4 | 0.0242 | 96.6 | 55-136 | | 3.4 | 20 | |
| 1,1-Dichloroethane | 0.0250 | 0.0000 | 0.0253 | 101 | 0.0251 | 101 | 58-133 | | 0.7 | 20 | |
| Di-isopropyl ether | 0.0250 | 0.0000 | 0.0244 | 97.5 | 0.0245 | 98.1 | 58-133 | | 0.6 | 20 | |
| 2,2-Dichloropropane | 0.0250 | 0.0000 | 0.0261 | 104 | 0.0259 | 103 | 51-141 | | 0.7 | 20 | |
| cis-1,2-Dichloroethene | 0.0250 | 0.0014 | 0.0257 | 97.1 | 0.0260 | 98.3 | 54-137 | | 1.2 | 20 | |
| 2-Butanone (MEK) | 0.125 | 0.0193 | 0.103 | 67.0 | 0.105 | 68.9 | 51-149 | | 2.4 | 22 | |
| Chloroform | 0.0250 | 0.0037 | 0.0261 | 89.8 | 0.0264 | 91.1 | 64-130 | | 1.2 | 20 | |
| 1,1,1-Trichloroethane | 0.0250 | 0.0000 | 0.0247 | 98.6 | 0.0246 | 98.5 | 58-137 | | 0.1 | 20 | |
| Carbon tetrachloride | 0.0250 | 0.0000 | 0.0252 | 101 | 0.0252 | 101 | 49-140 | | 0.1 | 20 | |
| 1,1-Dichloropropene | 0.0250 | 0.0000 | 0.0261 | 104 | 0.0258 | 103 | 50-140 | | 1.0 | 20 | |
| Benzene | 0.0250 | 0.0036 | 0.0281 | 97.8 | 0.0279 | 97.0 | 51-134 | | 0.7 | 20 | |
| 1,2-Dichloroethane | 0.0250 | 0.0000 | 0.0231 | 92.4 | 0.0233 | 93.2 | 59-135 | | 0.9 | 20 | |
| Trichloroethene | 0.0250 | 0.0058 | 0.0301 | 97.3 | 0.0298 | 96.1 | 40-155 | | 1.1 | 20 | |
| 1,2-Dichloropropane | 0.0250 | 0.0000 | 0.0240 | 95.9 | 0.0244 | 97.5 | 68-126 | | 1.6 | 20 | |
| Dibromomethane | 0.0250 | 0.0000 | 0.0248 | 99.1 | 0.0242 | 96.8 | 68-131 | | 2.3 | 20 | |
| Bromodichloromethane | 0.0250 | 0.0011 | 0.0217 | 82.5 | 0.0224 | 85.5 | 67-132 | | 3.4 | 20 | |
| 2-Chloroethyl vinyl ether | 0.125 | 0.0000 | 0.0221 | 17.7 | 0.0050 | 4.0 | 10-161 | J6 | 126 | 40 | J3 |
| cis-1,3-Dichloropropene | 0.0250 | 0.0000 | 0.0233 | 93.2 | 0.0240 | 96.2 | 63-127 | | 3.1 | 20 | |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.0000 | 0.130 | 104 | 0.134 | 107 | 53-154 | | 2.9 | 21 | |
| Toluene | 0.0250 | 0.0000 | 0.0241 | 96.2 | 0.0242 | 96.9 | 61-126 | | 0.7 | 20 | |
| trans-1,3-Dichloropropene | 0.0250 | 0.0036 | 0.0261 | 90.0 | 0.0267 | 92.5 | 59-130 | | 2.3 | 20 | |
| 1,1,2-Trichloroethane | 0.0250 | 0.0020 | 0.0225 | 82.1 | 0.0230 | 84.3 | 73-128 | | 2.3 | 20 | |
| Tetrachloroethene | 0.0250 | 0.0000 | 0.0223 | 89.2 | 0.0227 | 90.8 | 56-139 | | 1.8 | 20 | |
| 1,3-Dichloropropane | 0.0250 | 0.0000 | 0.0206 | 82.2 | 0.0218 | 87.2 | 70-122 | | 5.9 | 20 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 — Matrix: Water - mg/L
Project: Manhattan Village — EPA ID: TN00003
Collection Date: 5/30/2013 — **Analytic Batch: WG664527**
Analysis Date: 6/4/2013 — Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638813-01, -02, -04, -09, -15, -16

### Matrix Spike/Matrix Spike Duplicate

L638809-22

| Analyte | Spike Value | Sample | MS | % Rec | MSD | % Rec | Control Limits | % Rec Qualifier | % RPD | Control Limits | RPD Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chlorodibromomethane | 0.0250 | 0.0000 | 0.0201 | 80.5 | 0.0213 | 85.2 | 68-130 | | 5.7 | 20 | |
| 1,2-Dibromoethane | 0.0250 | 0.0000 | 0.0212 | 84.7 | 0.0221 | 88.6 | 71-129 | | 4.5 | 20 | |
| Chlorobenzene | 0.0250 | 0.0000 | 0.0211 | 84.6 | 0.0221 | 88.3 | 69-126 | | 4.3 | 20 | |
| 1,1,1,2-Tetrachloroethane | 0.0250 | 0.0000 | 0.0210 | 83.8 | 0.0219 | 87.7 | 71-130 | | 4.5 | 20 | |
| Ethylbenzene | 0.0250 | 0.0032 | 0.0250 | 87.4 | 0.0258 | 90.5 | 64-135 | | 3.1 | 20 | |
| m&p-Xylene | 0.0500 | 0.0000 | 0.0443 | 88.6 | 0.0451 | 90.2 | 62-135 | | 1.7 | 20 | |
| o-Xylene | 0.0250 | 0.0000 | 0.0210 | 84.1 | 0.0217 | 86.6 | 63-135 | | 3.0 | 20 | |
| Styrene | 0.0250 | 0.0000 | 0.0222 | 88.7 | 0.0228 | 91.1 | 58-152 | | 2.7 | 20 | |
| Bromoform | 0.0250 | 0.0000 | 0.0217 | 86.9 | 0.0232 | 93.0 | 59-137 | | 6.8 | 20 | |
| Isopropylbenzene | 0.0250 | 0.0064 | 0.0297 | 93.2 | 0.0304 | 95.7 | 62-134 | | 2.1 | 20 | |
| Bromobenzene | 0.0250 | 0.0018 | 0.0210 | 76.6 | 0.0216 | 79.2 | 64-130 | | 3.1 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0000 | 0.0212 | 84.7 | 0.0224 | 89.4 | 64-149 | | 5.5 | 20 | |
| 1,2,3-Trichloropropane | 0.0250 | 0.0000 | 0.0212 | 84.7 | 0.0221 | 88.3 | 74-137 | | 4.2 | 20 | |
| n-Propylbenzene | 0.0250 | 0.0176 | 0.0379 | 81.5 | 0.0389 | 85.6 | 62-137 | | 2.7 | 20 | |
| 2-Chlorotoluene | 0.0250 | 0.0000 | 0.0210 | 84.1 | 0.0217 | 86.7 | 65-133 | | 3.0 | 20 | |
| 4-Chlorotoluene | 0.0250 | 0.0007 | 0.0199 | 76.8 | 0.0206 | 79.4 | 67-129 | | 3.1 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0000 | 0.0215 | 86.1 | 0.0223 | 89.0 | 67-136 | | 3.4 | 20 | |
| tert-Butylbenzene | 0.0250 | 0.0000 | 0.0216 | 86.3 | 0.0228 | 91.2 | 66-139 | | 5.5 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0000 | 0.0207 | 82.6 | 0.0218 | 87.2 | 62-141 | | 5.4 | 20 | |
| sec-Butylbenzene | 0.0250 | 0.0016 | 0.0233 | 86.9 | 0.0241 | 90.2 | 67-139 | | 3.5 | 20 | |
| 1,3-Dichlorobenzene | 0.0250 | 0.0000 | 0.0204 | 81.7 | 0.0214 | 85.4 | 69-131 | | 4.5 | 20 | |
| p-Isopropyltoluene | 0.0250 | 0.0020 | 0.0244 | 89.5 | 0.0254 | 93.6 | 64-142 | | 4.1 | 20 | |
| 1,4-Dichlorobenzene | 0.0250 | 0.0000 | 0.0225 | 89.8 | 0.0224 | 89.8 | 70-123 | | 0.1 | 20 | |
| 1,2,3-Trimethylbenzene | 0.0250 | 0.0014 | 0.0224 | 83.8 | 0.0222 | 83.3 | 67-133 | | 0.6 | 20 | |
| 1,2-Dichlorobenzene | 0.0250 | 0.0000 | 0.0219 | 87.4 | 0.0219 | 87.8 | 75-125 | | 0.4 | 20 | |
| n-Butylbenzene | 0.0250 | 0.0021 | 0.0263 | 96.5 | 0.0260 | 95.6 | 62-142 | | 0.9 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0250 | 0.0000 | 0.0244 | 97.5 | 0.0250 | 100 | 55-148 | | 2.7 | 22 | |
| 1,2,4-Trichlorobenzene | 0.0250 | 0.0000 | 0.0236 | 94.5 | 0.0243 | 97.1 | 67-133 | | 2.7 | 20 | |
| Hexachloro-1,3-butadiene | 0.0250 | 0.0000 | 0.0220 | 88.2 | 0.0224 | 89.4 | 64-140 | | 1.4 | 20 | |
| Naphthalene | 0.0250 | 0.0014 | 0.0228 | 85.8 | 0.0238 | 89.7 | 65-140 | | 4.2 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0250 | 0.0000 | 0.0219 | 87.6 | 0.0227 | 90.9 | 68-135 | | 3.7 | 20 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 — Matrix: Water - mg/L
Project: Manhattan Village — EPA ID: TN00003
Collection Date: 5/30/2013 — **Analytic Batch: WG664527**
Analysis Date: 6/4/2013 — Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638813-01, -02, -04, -09, -15, -16

### Laboratory Control Sample/ Laboratory Control Sample Duplicate

| Analyte | Spike | LCS | % Rec | LCSD | % Rec | Control Limits | Qualifier | % RPD | Control Limits | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane | 0.0250 | 0.0196 | 78.3 | 0.0191 | 76.6 | 33-173 | | 2.2 | 20 | |
| Chloromethane | 0.0250 | 0.0247 | 98.7 | 0.0247 | 98.7 | 50-141 | | 0.0 | 20 | |
| Vinyl chloride | 0.0250 | 0.0257 | 103 | 0.0250 | 100 | 55-142 | | 2.5 | 20 | |
| Bromomethane | 0.0250 | 0.0365 | 146 | 0.0368 | 147 | 42-172 | | 0.8 | 20 | |
| Chloroethane | 0.0250 | 0.0276 | 110 | 0.0267 | 107 | 52-164 | | 3.1 | 20 | |
| Trichlorofluoromethane | 0.0250 | 0.0252 | 101 | 0.0247 | 98.8 | 53-161 | | 1.8 | 20 | |
| Acrolein | 0.125 | 0.116 | 92.7 | 0.108 | 86.1 | 10-181 | | 7.4 | 30 | |
| 1,1-Dichloroethene | 0.0250 | 0.0259 | 104 | 0.0264 | 106 | 54-134 | | 1.9 | 20 | |
| 1,1,2-Trichlorotrifluoroethane | 0.0250 | 0.0274 | 109 | 0.0267 | 107 | 53-143 | | 2.4 | 20 | |
| Acetone | 0.125 | 0.105 | 84.2 | 0.107 | 85.4 | 49-153 | | 1.5 | 21 | |
| Methylene Chloride | 0.0250 | 0.0230 | 92.2 | 0.0229 | 91.7 | 67-122 | | 0.5 | 20 | |
| Acrylonitrile | 0.125 | 0.117 | 93.9 | 0.118 | 94.2 | 53-153 | | 0.3 | 20 | |
| trans-1,2-Dichloroethene | 0.0250 | 0.0248 | 99.2 | 0.0244 | 97.7 | 63-127 | | 1.5 | 20 | |
| Methyl tert-butyl ether | 0.0250 | 0.0248 | 99.3 | 0.0248 | 99.4 | 67-127 | | 0.0 | 20 | |
| 1,1-Dichloroethane | 0.0250 | 0.0253 | 101 | 0.0252 | 101 | 73-123 | | 0.7 | 20 | |
| Di-isopropyl ether | 0.0250 | 0.0250 | 100 | 0.0252 | 101 | 66-129 | | 0.7 | 20 | |
| 2,2-Dichloropropane | 0.0250 | 0.0257 | 103 | 0.0257 | 103 | 63-130 | | 0.2 | 20 | |
| cis-1,2-Dichloroethene | 0.0250 | 0.0248 | 99.2 | 0.0247 | 98.8 | 75-121 | | 0.4 | 20 | |
| 2-Butanone (MEK) | 0.125 | 0.111 | 89.0 | 0.114 | 91.6 | 58-144 | | 2.9 | 20 | |
| Chloroform | 0.0250 | 0.0245 | 98.2 | 0.0243 | 97.2 | 76-122 | | 1.0 | 20 | |
| 1,1,1-Trichloroethane | 0.0250 | 0.0247 | 98.8 | 0.0245 | 97.9 | 71-126 | | 0.9 | 20 | |
| Carbon tetrachloride | 0.0250 | 0.0245 | 97.9 | 0.0246 | 98.3 | 63-129 | | 0.4 | 20 | |
| 1,1-Dichloropropene | 0.0250 | 0.0253 | 101 | 0.0253 | 101 | 67-127 | | 0.1 | 20 | |
| Benzene | 0.0250 | 0.0246 | 98.5 | 0.0245 | 97.9 | 72-119 | | 0.6 | 20 | |
| 1,2-Dichloroethane | 0.0250 | 0.0237 | 94.8 | 0.0237 | 94.8 | 69-128 | | 0.0 | 20 | |
| Trichloroethene | 0.0250 | 0.0237 | 94.9 | 0.0244 | 97.5 | 69-131 | | 2.8 | 20 | |
| 1,2-Dichloropropane | 0.0250 | 0.0239 | 95.6 | 0.0242 | 96.6 | 77-121 | | 1.0 | 20 | |
| Dibromomethane | 0.0250 | 0.0238 | 95.3 | 0.0240 | 95.9 | 77-124 | | 0.6 | 20 | |
| Bromodichloromethane | 0.0250 | 0.0223 | 89.1 | 0.0222 | 88.9 | 75-127 | | 0.2 | 20 | |
| 2-Chloroethyl vinyl ether | 0.125 | 0.110 | 87.9 | 0.108 | 86.6 | 26-172 | | 1.5 | 22 | |
| cis-1,3-Dichloropropene | 0.0250 | 0.0236 | 94.5 | 0.0238 | 95.0 | 74-124 | | 0.5 | 20 | |
| 4-Methyl-2-pentanone (MIBK) | 0.125 | 0.129 | 103 | 0.130 | 104 | 58-147 | | 0.4 | 20 | |
| Toluene | 0.0250 | 0.0233 | 93.4 | 0.0233 | 93.1 | 75-114 | | 0.3 | 20 | |
| trans-1,3-Dichloropropene | 0.0250 | 0.0243 | 97.2 | 0.0237 | 94.9 | 69-124 | | 2.4 | 20 | |
| 1,1,2-Trichloroethane | 0.0250 | 0.0224 | 89.7 | 0.0225 | 90.0 | 81-121 | | 0.4 | 20 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/30/2013 **Analytic Batch: WG664527**
Analysis Date: 6/4/2013 Analyst: 505
Instrument ID: VOCMS28
Sample Numbers: L638813-01, -02, -04, -09, -15, -16

### Laboratory Control Sample/ Laboratory Control Sample Duplicate

| Analyte | Spike | LCS | % Rec | LCSD | % Rec | Control Limits | Qualifier | % RPD | Control Limits | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 0.0250 | 0.0229 | 91.8 | 0.0229 | 91.8 | 69-131 | | 0.0 | 20 | |
| 1,3-Dichloropropane | 0.0250 | 0.0224 | 89.5 | 0.0219 | 87.8 | 78-117 | | 2.0 | 20 | |
| Chlorodibromomethane | 0.0250 | 0.0217 | 86.8 | 0.0217 | 86.6 | 73-128 | | 0.2 | 20 | |
| 1,2-Dibromoethane | 0.0250 | 0.0226 | 90.4 | 0.0223 | 89.3 | 78-124 | | 1.3 | 20 | |
| Chlorobenzene | 0.0250 | 0.0224 | 89.8 | 0.0223 | 89.2 | 78-123 | | 0.6 | 20 | |
| 1,1,1,2-Tetrachloroethane | 0.0250 | 0.0230 | 91.9 | 0.0232 | 92.7 | 77-128 | | 0.8 | 20 | |
| Ethylbenzene | 0.0250 | 0.0230 | 92.1 | 0.0229 | 91.7 | 77-124 | | 0.4 | 20 | |
| m&p-Xylene | 0.0500 | 0.0462 | 92.5 | 0.0449 | 89.7 | 76-123 | | 3.0 | 20 | |
| o-Xylene | 0.0250 | 0.0226 | 90.3 | 0.0228 | 91.3 | 77-125 | | 1.1 | 20 | |
| Styrene | 0.0250 | 0.0238 | 95.3 | 0.0234 | 93.7 | 69-145 | | 1.7 | 20 | |
| Bromoform | 0.0250 | 0.0235 | 94.1 | 0.0231 | 92.4 | 61-136 | | 1.9 | 20 | |
| Isopropylbenzene | 0.0250 | 0.0251 | 100 | 0.0246 | 98.3 | 74-126 | | 2.0 | 20 | |
| Bromobenzene | 0.0250 | 0.0215 | 86.2 | 0.0209 | 83.7 | 76-121 | | 2.9 | 20 | |
| 1,1,2,2-Tetrachloroethane | 0.0250 | 0.0230 | 92.0 | 0.0224 | 89.5 | 78-130 | | 2.8 | 20 | |
| 1,2,3-Trichloropropane | 0.0250 | 0.0227 | 91.0 | 0.0225 | 90.0 | 68-130 | | 1.0 | 20 | |
| n-Propylbenzene | 0.0250 | 0.0233 | 93.3 | 0.0230 | 92.0 | 77-125 | | 1.4 | 20 | |
| 2-Chlorotoluene | 0.0250 | 0.0223 | 89.0 | 0.0226 | 90.4 | 78-123 | | 1.5 | 20 | |
| 4-Chlorotoluene | 0.0250 | 0.0216 | 86.3 | 0.0214 | 85.7 | 78-122 | | 0.7 | 20 | |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0233 | 93.3 | 0.0229 | 91.8 | 78-127 | | 1.7 | 20 | |
| tert-Butylbenzene | 0.0250 | 0.0228 | 91.4 | 0.0230 | 92.1 | 76-131 | | 0.7 | 20 | |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0224 | 89.7 | 0.0223 | 89.0 | 77-129 | | 0.8 | 20 | |
| sec-Butylbenzene | 0.0250 | 0.0234 | 93.6 | 0.0231 | 92.3 | 77-130 | | 1.5 | 20 | |
| 1,3-Dichlorobenzene | 0.0250 | 0.0219 | 87.7 | 0.0220 | 88.0 | 77-127 | | 0.4 | 20 | |
| p-Isopropyltoluene | 0.0250 | 0.0239 | 95.7 | 0.0239 | 95.6 | 77-132 | | 0.1 | 20 | |
| 1,4-Dichlorobenzene | 0.0250 | 0.0221 | 88.5 | 0.0218 | 87.4 | 79-117 | | 1.3 | 20 | |
| 1,2,3-Trimethylbenzene | 0.0250 | 0.0211 | 84.3 | 0.0210 | 83.9 | 77-126 | | 0.4 | 20 | |
| 1,2-Dichlorobenzene | 0.0250 | 0.0220 | 87.8 | 0.0219 | 87.5 | 82-121 | | 0.4 | 20 | |
| n-Butylbenzene | 0.0250 | 0.0237 | 95.0 | 0.0233 | 93.3 | 74-130 | | 1.8 | 20 | |
| 1,2-Dibromo-3-Chloropropane | 0.0250 | 0.0235 | 94.2 | 0.0232 | 92.9 | 55-142 | | 1.3 | 20 | |
| 1,2,4-Trichlorobenzene | 0.0250 | 0.0248 | 99.4 | 0.0249 | 99.5 | 76-127 | | 0.1 | 20 | |
| Hexachloro-1,3-butadiene | 0.0250 | 0.0231 | 92.4 | 0.0225 | 90.2 | 71-134 | | 2.4 | 20 | |
| Naphthalene | 0.0250 | 0.0220 | 88.1 | 0.0226 | 90.4 | 70-134 | | 2.6 | 20 | |
| 1,2,3-Trichlorobenzene | 0.0250 | 0.0234 | 93.7 | 0.0233 | 93.1 | 77-130 | | 0.6 | 20 | |

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# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

Test: Volatile Organic Compounds by Method 8260B
Project No: 1358.001.01.003 Matrix: Water - mg/L
Project: Manhattan Village EPA ID: TN00003
Collection Date: 5/30/2013 **Analytic Batch: WG664328**
Analysis Date: 6/3/2013 Analyst: 559
Instrument ID: VOCMS26
Sample Numbers: L638813-03, -05, -06, -07, -08, -10, -11, -12, -13, -14, -17

### Internal Standard Response and Retention Time Summary

FileID:0603_02.D Date:6/3/2013 Time:9:43 AM

| | IS1 | | IS2 | | IS3 | | IS4 | |
|---|---|---|---|---|---|---|---|---|
| | Response | RT | Response | RT | Response | RT | Response | RT |
| 12 Hour Std | 372605 | 5.68 | 636423 | 6.16 | 98634 | 7.85 | 280345 | 11.03 |
| Upper Limit | 745210 | 6.18 | 1272846 | 6.66 | 197268 | 8.35 | 560690 | 11.53 |
| Lower Limit | 186302.5 | 5.18 | 318211.5 | 5.66 | 49317 | 7.35 | 140172.5 | 10.53 |
| Sample ID | Response | RT | Response | RT | Response | RT | Response | RT |
| Blank WG664328 | 397956 | 5.68 | 673507 | 6.16 | 100223 | 7.85 | 271766 | 11.03 |
| L638813-03 | 361246 | 5.68 | 617962 | 6.17 | 92120 | 7.85 | 255483 | 11.03 |
| L638813-05 | 381574 | 5.68 | 650626 | 6.16 | 95251 | 7.85 | 275397 | 11.03 |
| L638813-06 | 380930 | 5.68 | 648562 | 6.16 | 95084 | 7.85 | 271949 | 11.03 |
| L638813-07 | 380651 | 5.68 | 647303 | 6.16 | 95920 | 7.85 | 270345 | 11.03 |
| L638813-08 | 375508 | 5.68 | 641846 | 6.16 | 95506 | 7.85 | 266166 | 11.03 |
| L638813-10 | 370355 | 5.68 | 631347 | 6.16 | 94569 | 7.85 | 264066 | 11.03 |
| L638813-11 | 366027 | 5.68 | 623984 | 6.16 | 93635 | 7.85 | 261971 | 11.03 |
| L638813-12 | 360823 | 5.68 | 615067 | 6.16 | 91477 | 7.85 | 257084 | 11.03 |
| L638813-13 | 358758 | 5.68 | 611768 | 6.16 | 91128 | 7.85 | 257262 | 11.03 |
| L638813-14 | 365811 | 5.68 | 625348 | 6.16 | 93936 | 7.85 | 259953 | 11.03 |
| L638813-17 | 344877 | 5.68 | 591316 | 6.16 | 88183 | 7.85 | 249341 | 11.03 |
| LCS WG664328 | 387580 | 5.67 | 663605 | 6.16 | 101424 | 7.85 | 285937 | 11.03 |
| LCSD WG664328 | 380734 | 5.68 | 650765 | 6.16 | 99499 | 7.85 | 283645 | 11.03 |
| MS WG664328 | 382218 | 5.67 | 659275 | 6.16 | 100454 | 7.85 | 287344 | 11.03 |
| MSD WG664328 | 374714 | 5.68 | 649464 | 6.16 | 99707 | 7.85 | 279418 | 11.03 |

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Est. 1970

# Quality Control Summary
## SDG: L638813
## PES Environmental, Inc.- WA

| | | | |
|---|---|---|---|
| Test: | Volatile Organic Compounds by Method 8260B | | |
| Project No: | 1358.001.01.003 | Matrix: | Water - mg/L |
| Project: | Manhattan Village | EPA ID: | TN00003 |
| Collection Date: | 5/30/2013 | **Analytic Batch:** | **WG664527** |
| Analysis Date: | 6/4/2013 | Analyst: | 505 |
| Instrument ID: | VOCMS28 | | |
| Sample Numbers: | L638813-01, -02, -04, -09, -15, -16 | | |

### Internal Standard Response and Retention Time Summary

FileID:0604_02.D Date:6/4/2013 Time:8:36 AM

| | IS1 | | IS2 | | IS3 | | IS4 | |
|---|---|---|---|---|---|---|---|---|
| | Response | RT | Response | RT | Response | RT | Response | RT |
| 12 Hour Std | 163014 | 4.32 | 273526 | 4.65 | 44186 | 5.81 | 122656 | 8.2 |
| Upper Limit | 326028 | 4.82 | 547052 | 5.15 | 88372 | 6.31 | 245312 | 8.7 |
| Lower Limit | 81507 | 3.82 | 136763 | 4.15 | 22093 | 5.31 | 61328 | 7.7 |
| Sample ID | Response | RT | Response | RT | Response | RT | Response | RT |
| Blank WG664527 | 162552 | 4.32 | 273264 | 4.65 | 43061 | 5.81 | 124921 | 8.2 |
| L638813-01 | 164915 | 4.32 | 278995 | 4.65 | 43250 | 5.81 | 126146 | 8.2 |
| L638813-02 | 164933 | 4.32 | 272927 | 4.65 | 42262 | 5.81 | 126671 | 8.2 |
| L638813-04 | 169402 | 4.32 | 282331 | 4.65 | 43507 | 5.81 | 125575 | 8.2 |
| L638813-09 | 169603 | 4.32 | 280151 | 4.65 | 44254 | 5.81 | 129624 | 8.2 |
| L638813-15 | 165210 | 4.32 | 277670 | 4.65 | 42908 | 5.81 | 129955 | 8.2 |
| L638813-16 | 166652 | 4.32 | 278642 | 4.65 | 44415 | 5.81 | 127351 | 8.2 |
| LCS WG664527 | 162306 | 4.32 | 274596 | 4.64 | 43278 | 5.81 | 125019 | 8.2 |
| LCSD WG664527 | 163074 | 4.32 | 272260 | 4.65 | 43489 | 5.81 | 126628 | 8.2 |
| MS WG664527 | 164081 | 4.32 | 274115 | 4.65 | 47116 | 5.81 | 122380 | 8.2 |
| MSD WG664527 | 162548 | 4.32 | 273077 | 4.65 | 45784 | 5.81 | 125006 | 8.2 |

C093

# PES Environmental, Inc. - WA
1215 4th Ave Suite 1350
Seattle, WA 98161

Billing Information:
attn: Accounts Payable
1215 4th Ave Suite 1350
Seattle, WA 98161

Report to: Kelly Rankich
Email to: krankich@pesenv,com

Project Description: Manhattan Village
City/Sate Collected: Normandy Park, WA

Phone: (206)529=3980
FAX: (206)529-3985
Client Project #: 1358.001.01.003
ESC Key:

Collected by: Karsten Springstead
Site/Facility ID#:
P.O.#:

Collected by (signature):
Immediately Packed on Ice N (Y)

Rush? ( Lab MUST Be Notified )
____ Same Day.....200%
____ Next Day.....100%
____ Two Day.....50%
____ Three Day.....25%

Date Results Needed:
Email? __No✓Yes
FAX? __No__Yes

Analysis/Container/Preservative
V8260 40mL Amb-HCl

Chain of Custody
Page 1 of 1

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Mt. Juliet, TN 37122
Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

CoCode (lab use only)
Template/Prelogin
Shipped Via:

| Sample ID | Comp/Grab | Matrix* | Depth | Date | Time | No. of Cntrs | V8260 40mL Amb-HCl | Remarks/Contaminant | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|
| DC-8 | Grab | GW | 40 | 5-30 | 915 | 2 | X | | L673817-01 |
| MW-2 | Grab | GW | 38 | 5-30 | 1045 | 2 | X | | 02 |
| DC-13 | Grab | GW | 39 | 5-30 | 1115 | 2 | X | | 03 |
| DC-12 | Grab | GW | 40 | 5-30 | 1215 | 2 | X | | 04 |
| DC-18 | Grab | GW | 39 | 5-30 | 1315 | 2 | X | | 05 |
| DC-20 | Grab | GW | 40 | 530 | 1415 | 2 | X | | 06 |
| DC-4 | Grab | GW | 49 | 5-30 | 1515 | 2 | X | | 07 |
| DC-7 | Grab | GW | 37.5 | 5-30 | 1615 | 2 | X | | 08 |
| EQ-3 | Grab | GW | — | 5-30 | 1630 | 2 | X | | 09 |

*Matrix: **SS** - Soil/Solid **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Remarks:

5847034373 2075 Flow _____ Other _____

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| | 5-31-13 | 1415 | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
| | | | |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) |
| | | | |

Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ _____
Temp: 3.1
Bottles Received: 3 3 VP
Date: 6/1/13
Time: 0930

Condition: (lab use only)
CoC Seals Intact: ___Y ___N ___NA
pH Checked:
NCF:

# PES Environmental, Inc. - WA
1215 4th Ave Suite 1350
Seattle, WA 98161

**Billing Information:**
attn: Accounts Payable
1215 4th Ave Suite 1350
Seattle, WA 98161

Report to: Kelly Rankich
Email to: krankich@pesenv,com

Project Description: Manhattan Village
City/Sate Collected: Normandy Park, WA

Phone: (206)529=3980
FAX: (206)529-3985
Client Project #: 1358.001.01.003
ESC Key:

Collected by: Karsten Springstead
Site/Facility ID#:
P.O.#:

Collected by (signature):
Immediately Packed on Ice N (Y)

**Rush?** ( Lab MUST Be Notified )
____ Same Day.....200%
____ Next Day.....100%
____ Two Day .....50%
____ Three Day.....25%

**Date Results Needed:**
Email? __No✓Yes
FAX? __No__Yes

Chain of Custody
Page 1 of 1

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Phone (615) 758-5858
Fax: (615) 758-5859

CoCode (lab use only)
Template/Prelogin
Shipped Via:

| Sample ID | Comp/Grab | Matrix* | Depth | Date | Time | No. of Cntrs | V8260 40mL Amb-HCl | Remarks/Contaminant | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|
| MW-11 | Grab | GW | 37 | 5-31 | 815 | 2 | X | | 439810 |
| MW-16 | Grab | GW | 39.5 | 5-31 | 915 | 2 | X | | 11 |
| DC-17 | Grab | GW | 35 | 5-31 | 1015 | 2 | X | | 12 |
| KMW-2 | Grab | GW | 37 | 5-31 | 1130 | 2 | X | | 13 |
| DC-10A | Grab | GW | 37 | 5-31 | 1300 | 2 | X | | 14 |
| EQ-4 | Grab | GW | | 5-31 | 1315 | 2 | X | | 15 |
| TRIP BLANK | | | | | | 1 | X | | 16 |
| RINM-W | COMP | WW | — | 5-31 | 1330 | 2 | X | | 17 |
| | | | | | | | | | |

*Matrix: **SS** - Soil/Solid **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Remarks:

Flow _____ Other _____

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ _____ | Condition: (lab use only) |
|---|---|---|---|---|---|
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Temp: 2.1 / Bottles Received: 3 VP | CoC Seals Intact: ✓ Y ___ N ___ NA |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) | Date: 6/1/13 / Time: 0930 | pH Checked: / NCF: |

# MEMORANDUM

**TO:** Project File **DATE:** June 7, 2013

**FROM:** Jerry Harris

**SUBJECT:** Laboratory Data Validation Review

**PROJECT:** Manhattan Village

**PROJECT #:** 1325.003.01.003

**TASK:** May 30-31, 2013 Groundwater Samples

**LAB:** ECS Lab Sciences Request No. L638813

---

Fourteen (14) groundwater samples were collected at the Manhattan Village site on May 30 and 31, 2013. In addition, two equipment rinsate blanks were collected in the field, shipped with the samples, and analyzed. A trip blank was also prepared by the laboratory, traveled with the samples and was analyzed. The samples were analyzed for VOCs by USEPA Method 8260. Two USEPA 8260 analysis lots (lot IDs WG664328 and WG664527) were analyzed. Laboratory analytical services were provided by ECS Lab Sciences (ECS) of Mt. Juliet, Tennessee. ECS project number: L638813.

The quality assurance review of the laboratory data is summarized below.

## DATA QUALIFICATIONS

Guidelines established by USEPA for review of analytical data were used to validate the data. The comments presented in this memorandum refer to the laboratory's performance in meeting the quality control criteria outlined in the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA, 1999).

## DATA VALIDATION

### Completeness

All samples were collected and analyzed as requested. No concerns, issues, or anomalies were identified in the laboratory report.

### Sample Collection and Preservation

The samples were stored on ice in a cooler and delivered in good condition to the laboratory. The cooler temperature at the time of receipt was measured at 3.1 degrees Centigrade (°C). A temperature blank was not included in the cooler. The cooler temperature was within the recommended temperature preservation range of 4.0 +/- 2.0 °C. No data qualifications were warranted.

## Holding Times

The analyses for USEPA 8260 VOCs were performed within five days of sample collection. This is within the 14-day recommended holding time limit for water samples

No data were qualified based upon holding times.

## Initial Calibration

Hard copies of the initial calibration data for this project are not required in the data deliverable and are typically not reported. The laboratory is required to discuss discrepancies in initial calibration results associated with the project analyses if they occur. No initial calibration issues were reported; therefore no data qualifications were warranted.

## Continuing Calibration

Hard copies of the continuing calibration verification (CCV) data for this project are not required in the data deliverable and are typically not reported. The laboratory is required to discuss discrepancies in continuing calibration results associated with the project analyses if they occur. No initial calibration issues were reported; therefore no data qualifications were warranted.

## Method Blank Results

Two laboratory method blanks were analyzed; one with each sample extraction lot. This meets the required frequency for analyzing method blanks for the USEPA 8260 analytical method. The method blank results did not report any compounds at concentrations at or above the MRLs. No data qualifications were warranted.

## Trip Blank Results

A trip blank was not collected with this sample group; however, a trip blank was prepared and analyzed during the sampling event. The results of this trip blank are considered applicable to all samples collected during the sampling event. No target analytes were detected in the trip blank. No qualifications were warranted.

## Equipment Rinsate Blank Results

Two field equipment rinsate blanks were collected. The rinsate blanks were collected by running laboratory-provided pure water through the sample collection pump. The two rinsate samples were analyzed by USEPA Method 8260 with the project samples. No target analytes were detected in the rinsate blanks. No data qualifications were warranted.

## Field Duplicate Analyses

No field duplicates were required or collected during this sampling event.

## Laboratory Duplicate Analyses

Two laboratory control sample (LCS) duplicates and two matrix spike (MS) duplicates were prepared and analyzed; one set for each of the two sample groups. This meets the requirements of the method. The duplicate results are discussed in the LCS and MS sections below.

## Surrogate Recoveries

The surrogate percent recovery (%R) results for the USEPA 8260 samples, method blank, , matrix spike, laboratory control sample and duplicates were within the laboratory surrogate control limits. No data qualifications were warranted.

## Laboratory Control Samples

Two LCSs were analyzed; one with each of the two USEPA 8260 analytical groups. The LCSs were analyzed at the appropriate frequency for this project. The LCS recovery results for all control compounds met the %R acceptance criteria. In addition, two LCS duplicates were prepared and analyzed. The LCS duplicate %Rs and the LCS-LCS duplicate relative percent differences (RPDs) were within the laboratory control limits. No data qualifications were warranted.

## Matrix Spike/Matrix Spike Duplicates

A batch (non-project) MS was prepared and analyzed with USEPA 8260 method sample group WG664328 and a second batch MW was prepared and analyzed with sample group WG664527. This meets the USEPA method requirements. MS duplicates (MSD) were also prepared and analyzed with each sample group. The %Rs for all spiked compounds in the WG664328 MS and MSD were within the laboratory control limits except for 2-chloroethyl-vinyl-ether in the MSD. For 2-chloroethyl-vinyl-ether, the %R in the MSD was below the lower control limit. This compound was not detected in the project samples. The remaining laboratory quality control data for this compound was reviewed and no other potential quantitation issues were identified. Because the MS and MSD were prepared from a batch (non-project) sample, the remaining quality control data for this compound was within control limits, and the laboratory instrumentation was able to detect 2-chloroethyl-vinyl-ether in the LCS and MS/MSD samples (after spiking), the MSD %R exceedance is not considered sufficient cause to warrant qualification of the data. The MS-MSD RPD for 2-chloroethyl-vinyl-ether also exceeded the laboratory control limit. Because 2-chloroethyl-vinyl-ether was not detected in the project samples, this exceedance does not warrant qualification of the data.

The %Rs for all spiked compounds in the WG664527 MS and MSD were within the laboratory control limits except for acrolein and acetone in the MS and MSD and 2-chloroethyl-vinyl-ether in the MSD. For acrolein the %Rs in the MS and MSD were above the upper control limit. For acetone the %Rs in the MS and MSD were below the lower control limit. For 2-chloroethyl-vinyl-ether the %R in the MSD was below the lower control limit. These compounds were not detected in the project samples. The remaining laboratory quality control data for these compounds was reviewed and no other potential quantitation issues were identified. Because the MS and MSD were prepared from a batch (non-project) sample, the remaining quality control

data for this compound was within control limits, and the laboratory instrumentation was able to detect all three compounds in the LCS and MS/MSD samples (after spiking), the MS and MSD %R exceedances are not considered sufficient cause to warrant qualification of the data. The MS-MSD RPD for 2-chloroethyl-vinyl-ether also exceeded the laboratory control limit. Because 2-chloroethyl-vinyl-ether was not detected in the project samples, this exceedance does not warrant qualification of the data.

Based upon the above information, the MS and MSD exceedances in the batch samples are not considered sufficient cause to warrant qualification of the data. No qualifications were assigned.

**Other Quality Control Issues**

No other laboratory quality control issues were identified in the laboratory report.

**Quantitation Limits**

Results of the USEPA 8260 VOC analyses were reported based on laboratory MRLs. The MRLs indicate the minimum quantity of a target analyte that can be confidently determined by the reference method. The MRLs and MDLs were acceptable for the project; therefore, no data qualifications were warranted.

**Data Assessment**

No data were qualified. All data are judged to be acceptable for their intended use.

## Kelly Rankich

**From:** Matt Dahl
**Sent:** Wednesday, April 02, 2014 6:22 PM
**To:** Courtney Seim (cseim@riddellwilliams.com); Robert DiJulio (rdijulio@wpblaw.com)
**Cc:** Mike Staton (mstaton@slrconsulting.com); Cliff Schmitt (cschmitt@farallonconsulting.com); Kelly Rankich
**Subject:** DRAFT O&M Status Report - Manhattan Village and Harris Properties: September 2013 through March 2014
**Attachments:** O&M_status_2014_0402.pdf

Courtney and Bob –

We are sending this e-mail to serve as the O&M status report covering the last 7 months of SVE system operation. The status report includes the summary below and the PDF attachments.

**O&M Reporting Period: September 2013 through March 2014**

PES Environmental, Inc. conducted monthly site checks and quarterly operations and maintenance (O&M) visits of the Soil Vapor Extraction (SVE) system at the Manhattan Village Shopping Center/Harris Properties. The monthly site checks were to ensure proper system operation, drain condensate as needed, and record basic operating parameters. The quarterly O&M visits included field measurements for vacuum, flow rates, volatile organic compound (VOC) concentrations of the effluent stack using a photo-ionization detector (PID), collecting effluent stack samples for tetrachloroethene (PCE) laboratory analysis using USEPA Method TO-15, and draining the condensate as needed.

The SVE system was 84% operational during this reporting period. The blower was down for approximately 24 days due to a suspected power outage. The blower was down for an additional 10 days due to freezing temperatures and a broken belt. Roger's Machinery replaced the belt and changed the oil on February 14, 2014. On February 19, 2014, PES observed damage to the SVE knockout tank site tube. PES performed immediate temporary repairs and then replaced the broken portions of the site tube on March 12, 2014.

PES opened up SVE-9 and SVE-10 and re-balanced the flows in the individual SVE legs on September 11, 2013 and collected TO-15 samples of the individual SVE legs on November 5, 2013. On February 19, 2014, SVE-5 through SVE-10 were closed to evaluate rebound conditions in groundwater monitoring wells.

System flow rates ranged from 242 to 280 standard cubic feet per minute (scfm), based on calculations using the differential pressure gauge readings. The PCE concentrations in the system effluent in November and March were 108 and 53.90 parts per billion by volume (ppbv), respectively. PCE removal rates ranged from 0.008 to 0.018 pounds per day and approximately 3 pounds of PCE were removed during this reporting period. A total of approximately 95 pounds of PCE have been removed since the current SVE system operations began in September 2009.

The field measurements and PCE removal calculations are presented in the attached Table 1 and a chart showing the total pounds of PCE removed versus time is included on the attached figure. The operating parameters and PCE concentrations for the individual SVE legs is presented in the attached Table 2. The laboratory analytical reports for the SVE effluent samples and SVE leg samples are attached.

Approximately 385 gallons of non-hazardous SVE condensate was disposed by Marine Vacuum on March 13, 2014 (along with 165 gallons of SVE well drilling decon water). The waste disposal manifest is attached. The laboratory analytical report for a sample collected from the non-hazardous SVE condensate and drilling decon water is also attached.

**O&M Activities to be conducted next period:**

PES is planning to conduct routine monthly site checks and quarterly O&M visits.

**Comments**

The lower PCE removal rate is due likely due to the closing of SVE-5 through SVE-10. Remediation system upgrades are in the design stage and the groundwater rebound monitoring will be conducted in April.

Please let us know if you have any questions.

Regards,

Matt Dahl, P.E.
PES Environmental , Inc.
*ph: (206) 529-3980 ext. 103*
*cell: (425) 922-0872*
*fax: (206) 529-3985*

**Attachments**

**SVE System Status**

**Reporting Period: September 2013 through March 2014**

- **Table 1 - SVE System Operation and Maintenance Data**
- **Table 2 – SVE System Operation and Maintenance Data – SVE Leg Data (11/15/2013)**
- **Figure 1 – Cumulative PCE Removed**
- **SVE Effluent Stack Sample Lab Data**
    - **November 5, 2013 – Fremont Analytical Report 1311026**
    - **March 13, 2014 – Fremont Analytical Report 1403142**
- **SVE Condensate Sample Lab Data**
    - **February 19, 2014 – Fremont Analytical Report 1402176**
- **SVE Condensate Disposal Manifests**
    - **Marine Vacuum Service, Inc.**

# Table 1
## SVE System Operation and Maintenance Data
## Manhattan Village/Harris Properties
## Normandy Park, Washington

| Date | Time | Period Run Time (days) | System Down Time (days) | Electrical Meter (KWH) | Operating Wells[5] | Diff. Press. (in. w.c.) | Blower Vacuum (in. w.c.) | Temp. (deg F) | Flow[1] (scfm) | Header Vacuum (in.w.c.) | VOC[2] (ppm) | Lab Data | | PCE Removal Rate[3] (lb/day) | Cumulative PCE Removed[4] (lbs) | Condensate | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | PCE (ppbv) | PCE (µg/m$^3$) | | | Transferred (gallons) | On-site (gallons) | |
| 3/8/12 | 1115 | - | - | - | 1, 3, 5, 6, 7, 10 | 4 | - | - | 270 | 16 | 0.2 | 200 | 1,400 | 0.03 | 72.5 | NA | NA | per ERM data tables, revised by PES |
| 7/12/12 | 830 | 126 | 0 [6] | - | 1, 3, 5, 6, 7, 10 | 4 | - | - | 270 | 14.5 | 0.5 | 260 | 1,800 | 0.044 | 77.1 | NA | NA | data collected by ERM |
| 11/15/12 | 1100 | 126 | 0 [6] | - | 1, 3, 5, 6, 7, 10 | 4.1 | - | - | 273 | 15 | 0.4 | 460 | 3,100 | 0.076 | 84.7 | NA | 690 | data collected by ERM; estimate of condensate |
| 2/8/13 | - | - | - | - | - | - | - | - | - | | - | - | - | - | - | 150 | 840 | site visit to drain condensate |
| 3/11/13 | 900 | 116 | 0 [6] | 15387 | 1, 2, 3, 5, 6, 7, 10 | 4.2 | 30 | - | 275 | 17 | 0.171 | 93.4 | 633 | 0.016 | 90.0 | 90 | 930 | O&M |
| 3/21/13 | - | - | - | - | - | - | - | - | - | | - | - | - | - | - | 0 | 930 | Oil Change; synthetic VG-220 |
| 4/10/13 | 815 | 30 | 0 [6] | 15708 | 1, 2, 3, 5, 6, 7, 10 | 4.2 | 30 | 54.2 | 275 | 17 | 0.171 | - | - | - | - | 80 | 1,010 | site check |
| 5/10/13 | 730 | 30 | 0 [6] | 16029 | 1, 2, 3, 5, 6, 7, 10 | 4.2 | 30 | - | 275 | - | - | - | - | - | - | 40 | 1,050 | site check; condensate sample |
| 6/14/13 | 800 | 35 | 0 [6] | 16430 | 1, 2, 3, 4, 5, 6, 7, 10 | 4.2 | 50 | 57.0 | 275 | 17 | 0.114 | 83.4 | 566 | 0.014 | 91.4 | 0 | 0 | O&M; condensate disposal |
| 6/20/13 | - | 6 | 0 [6] | - | 1, 2, 3, 4, 5, 6, 7, 10 | - | - | - | - | - | - | - | - | - | - | 0 | 0 | AS Pilot Test; SVE shut down during test; condensate disposal |
| 6/27/13 | - | 7 | 0 [6] | - | 1, 2, 3, 4, 5, 6, 7, 10 | - | 42 | - | - | - | - | - | - | - | - | 0 | 0 | changed in-line filter |
| 7/11/13 | 1500 | 14 | 0 [6] | 16742 | 1, 2, 3, 4, 5, 6, 7, 10 | 4.0 | 42 | - | 268 | - | - | - | - | 0.014 | 91.8 | 0 | 0 | site check |
| 8/6/13 | 700 | 26 | 0 [6] | 17040 | 1, 2, 3, 4, 5, 6, 7, 10 | 3.5 | 42 | - | 251 | - | - | - | - | 0.013 | 92.1 | 0 | 0 | site check |
| 9/11/13 | 1330 | 36 | 0 [6] | 17454 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 | 4.0 | 40 | 75.5 | 256 | 14 | 0.23 | - | - | - | - | 0 | 0 | O&M and SVE leg balancing |
| 10/17/13 | 730 | 36 | 0 [6] | 17837 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 | 4.2 | 18.5 | 75.5 | 269 | - | - | - | - | - | - | 30 | 30 | site check |
| 11/5/13 | 1000 | 19 | 0 [6] | 18038 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 | 4.4 | 24 | 51.0 | 280 | 15.5 | 0.11 | 108 | 733 | 0.018 | 93.6 | 15 | 45 | O&M and SVE leg TO-15 sampling (see Table 2) |
| 12/3/13 | 630 | 28 | 0 [6] | 18338 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 | 4.2 | 19 | 44.7 | 277 | - | - | - | - | - | - | 110 | 155 | site check |
| 1/3/14 | - | 7 | 24.5 | - | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 | - | - | - | - | - | - | - | - | - | - | 80 | 235 | site check; system down; re-started |
| 2/6/14 | 1130 | 32 | 2.0 | - | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 | - | - | - | - | - | - | - | - | - | - | 0 | 155 | site check; system down due to weather; broken blower belt |
| 2/14/14 | - | 0 | 8.0 | - | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 | - | - | - | - | - | - | - | - | - | - | 0 | 155 | Blower repaired and system re-started by Rogers |
| 2/19/14 | 9:00 | 5 | 0 [6] | - | 1,2,3,4 | 4.2 | 30 | 44.9 | 273 | - | - | - | - | 0.018 | 94.8 | 90 | 325 | closed SVE-5 through SVE-10; temp. repairs to site tube |
| 3/13/14 | 13:00 | 22 | 0 [6] | 18759 | 1,2,3,4 | 3.5 | 29 | 50.8 | 242 | 29.0 | 0.11 | 53.90 | 366 | 0.008 | 95.0 | 110 | 110 | repaired site tube 3/12/14; O&M and SVE leg monitoring; MarVac onsite |

**Notes:**

1. Calculated flow rate based on differential pressure (diff. press.) and normalized to standard conditions
2. As measured with a photoionization detector (PID) adjusted using 0.57 correction factor for PCE
3. Mass Removal Rate = [flow (scfm) * PCE (µg/m$^3$) * 28.3168 (L/cf) / 1,000 (L/m$^3$) / 453,592,370 (µg/lb) * 60 (min/hour) * 24 (hour/day)]
4. Cumulative mass removed = average mass removal rates from previous and current O&M visit * period run time
5. The numbers refer to the SVE well number
6. Blower operating hours meter is not working, blower assumed to have run continuously

KWH = Kilowatt Hours
in. w.c. = inches of water column
scfm = standard cubic feet per minute
deg F = degrees Fahrenheit
NM = not measured
PCE = tetrachloroethene
ppm = parts per million
ppbv = parts per billion by volume
VOC = Volatile Organic Compounds
µg/m$^3$ = micrograms per cubic meter
lb/day = pounds per day
NA = not available
Temp. = Temperature

# Table 2
## SVE System Operation and Maintenance Data - SVE Leg Data (11/15/2013)
## Manhattan Village/Harris Properties
## Normandy Park, Washington

| SVE Well | Valve Position (% open) | Velocity (ft/min) | Estimated Flow | | Vacuum (in.w.c.) | Temp. (deg F) | VOC (ppm) | Lab Data | | Estimated Mass | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Flow (scfm) | Percent of Total (%) | | | | PCE (ppbv) | PCE ($\mu g/m^3$) | Mass Rate (lb/month) | Percent of Total (%) | |
| SVE-1 | 100% | 1275 | 18 | 7% | 2.5 | 53.3 | 0.1 | 149 | 1,010 | 0.05 | 10% | |
| SVE-2 | 100% | 1375 | 19 | 8% | 3.0 | 53.6 | 0.0 | 144 | 977 | 0.05 | 10% | |
| SVE-3 | 66% | 1600 | 22 | 9% | 3.5 | 50.4 | 0.0 | 282 | 1,920 | 0.12 | 24% | |
| SVE-4 | 50% | 1850 | 26 | 11% | 4.0 | 50.2 | 0.0 | 60.8 | 412 | 0.03 | 6% | 1 |
| SVE-5 | 50% | 1900 | 26 | 11% | 4.5 | 51.9 | 0.0 | 73.5 | 499 | 0.04 | 7% | |
| SVE-6 | 50% | 1800 | 25 | 10% | 6.5 | 51.3 | 0.0 | 122 | 827 | 0.06 | 11% | |
| SVE-7 | 66% | 1875 | 26 | 11% | 5.0 | 52.1 | 0.0 | 107 | 723 | 0.05 | 10% | |
| SVE-8 | 66% | 1900 | 26 | 11% | 5.0 | 53.1 | 0.1 | 66.1 | 448 | 0.03 | 7% | 2 |
| SVE-9 | 50% | 1900 | 26 | 11% | 5.0 | 51.5 | 0.1 | 47.9 | 325 | 0.02 | 5% | 2 |
| SVE-10 | 66% | 1750 | 24 | 10% | 2.8 | 54.1 | 0.0 | 104 | 709 | 0.05 | 10% | |
| | | TOTAL | 240 | | | | | | | 0.49 | | |
| | | | | | | | | | | | | |
| Stack | NA | 3000 | 240 | 100% | 15.5 | 51.0 | 0.2 | 108 | 733 | 0.47 | 100% | |

**Notes:**

1. SVE well flow rates are estimated based on field air velocity measurments in 2-inch PVC lateral pipes, and normalized relative to the SVE stack discharge flow rate.
2. Mass rate (lb/month) is estimated based on Q(scfm) x PCE (µg/m3) x 35.315 scfm/m3 x 1e-9 kg/µg x 2.204 lb/kg x 1440 min/day x 30 day/month
3. Field VOCs measured using a PID.

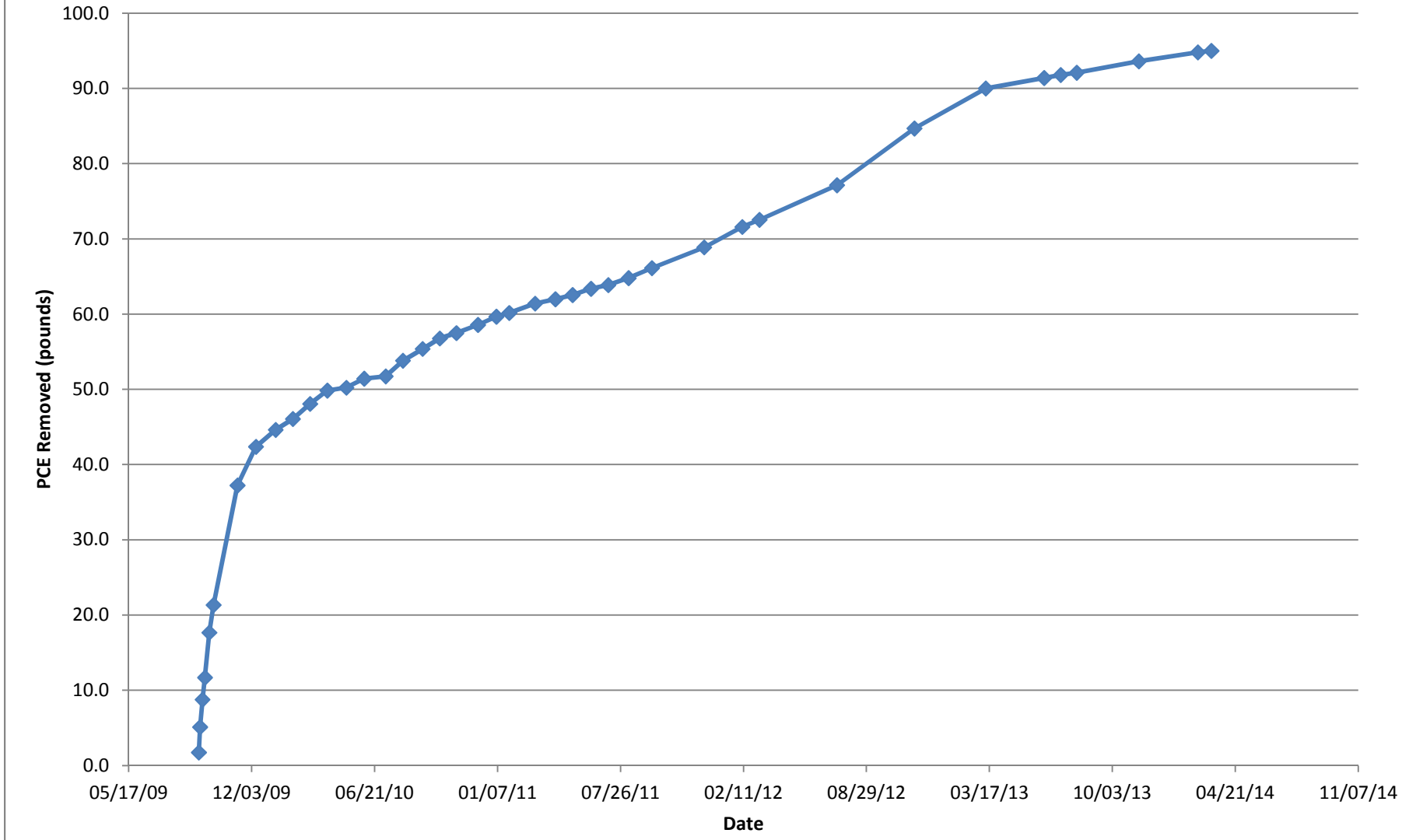
**Comments:**

1. Well was offline from 12.2011 to 6/2013.
2. Well was offline from 12/2011 to 9/2013. Restarted for flow and VOC testing.

**Abbreviations:**

in. w.c. = inches of water column
scfm = standard cubic feet per minute
deg F = degrees Fahrenheit
PCE = tetrachloroethene
ppm = parts per million
ppbv = parts per billion by volume

# Figure 1
# Cumulative PCE Removed
# Manhattan Village/Harris Properties




G:\Draft\1358-Harris_Mahattan_Tenants_in_Common\Excel\O\O&M table_2014 Chart1

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

**PES Environmental, Inc.**
Matt Dahl
1215 Fourth Avenue, Suite 1350
Seattle, WA 98161

**RE: MVSC**
**Lab ID: 1311026**

November 12, 2013

**Attention Matt Dahl:**

Fremont Analytical, Inc. received 11 sample(s) on 11/5/2013 for the analyses presented in the following report.

***Volatile Organic Compounds by EPA Method TO-15***

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Michael Dee
Sr. Chemist / Principal

**Date:** *11/19/2013*

**CLIENT:** PES Environmental, Inc.
**Project:** MVSC
**Lab Order:** 1311026

# Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Date/Time Collected | Date/Time Received |
|---|---|---|---|
| 1311026-001 | SVE-9-110513 | 11/05/2013 12:15 PM | 11/05/2013 2:00 PM |
| 1311026-002 | SVE-1-110513 | 11/05/2013 12:45 PM | 11/05/2013 2:00 PM |
| 1311026-003 | SVE-6-110513 | 11/05/2013 11:40 AM | 11/05/2013 2:00 PM |
| 1311026-004 | SVE-5-110513 | 11/05/2013 11:30 AM | 11/05/2013 2:00 PM |
| 1311026-005 | SVE-4-110513 | 11/05/2013 11:15 AM | 11/05/2013 2:00 PM |
| 1311026-006 | SVE-10-110513 | 11/05/2013 12:30 PM | 11/05/2013 2:00 PM |
| 1311026-007 | SVE-8-110513 | 11/05/2013 12:00 PM | 11/05/2013 2:00 PM |
| 1311026-008 | SVE-7-110513 | 11/05/2013 11:50 AM | 11/05/2013 2:00 PM |
| 1311026-009 | SVE-3-110513 | 11/05/2013 11:00 AM | 11/05/2013 2:00 PM |
| 1311026-010 | SVE-2-110513 | 11/05/2013 1:00 PM | 11/05/2013 2:00 PM |
| 1311026-011 | SYS-1113 | 11/05/2013 10:45 AM | 11/05/2013 2:00 PM |

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

# Case Narrative

WO#: **1311026**
Date: **11/12/2013**

**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

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

II. GENERAL REPORTING COMMENTS:
Air samples are reported in ppbv and ug/m3.

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

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

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1311026
**Project:** MVSC

**Client Sample ID:** SVE-9-110513
**Lab ID:** 1311026-001A
**Sample Type:** Summa Canister

**Date Sampled:** 11/5/2013
**Date Received:** 11/5/2013

| Analyte | Concentration (ppbv) | Concentration (ug/m³) | Reporting Limit (ppbv) | Reporting Limit (ug/m³) | Qual | Method | Date/Analyst | |
|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | | |
| Tetrachloroethene (PCE) | 47.9 | 325 | 0.300 | 2.03 | | TO-15 | 11/08/2013 | MD |
| Surr: 4-Bromofluorobenzene | 83.0 %Rec | -- | 70-130 | -- | | TO-15 | 11/08/2013 | MD |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1311026
**Project:** MVSC

**Client Sample ID:** SVE-1-110513
**Lab ID:** 1311026-002A
**Sample Type:** Summa Canister

**Date Sampled:** 11/5/2013
**Date Received:** 11/5/2013

| Analyte | Concentration (ppbv) | Concentration (ug/m³) | Reporting Limit (ppbv) | Reporting Limit (ug/m³) | Qual | Method | Date/Analyst | |
|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | | |
| Tetrachloroethene (PCE) | 149 | 1,010 | 0.300 | 2.03 | | TO-15 | 11/08/2013 | MD |
| Surr: 4-Bromofluorobenzene | 82.3 %Rec | -- | 70-130 | -- | | TO-15 | 11/08/2013 | MD |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1311026
**Project:** MVSC

**Client Sample ID:** SVE-6-110513
**Lab ID:** 1311026-003A
**Sample Type:** Summa Canister

**Date Sampled:** 11/5/2013
**Date Received:** 11/5/2013

| Analyte | Concentration (ppbv) | Concentration (ug/m³) | Reporting Limit (ppbv) | Reporting Limit (ug/m³) | Qual | Method | Date/Analyst | |
|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | | |
| Tetrachloroethene (PCE) | 122 | 827 | 0.300 | 2.03 | | TO-15 | 11/08/2013 | MD |
| Surr: 4-Bromofluorobenzene | 82.9 %Rec | -- | 70-130 | -- | | TO-15 | 11/08/2013 | MD |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1311026
**Project:** MVSC

**Client Sample ID:** SVE-5-110513
**Lab ID:** 1311026-004A
**Sample Type:** Summa Canister

**Date Sampled:** 11/5/2013
**Date Received:** 11/5/2013

| Analyte | Concentration (ppbv) | Concentration (ug/m³) | Reporting Limit (ppbv) | Reporting Limit (ug/m³) | Qual | Method | Date/Analyst | |
|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | | |
| Tetrachloroethene (PCE) | 73.5 | 499 | 0.300 | 2.03 | | TO-15 | 11/08/2013 | MD |
| Surr: 4-Bromofluorobenzene | 83.0 %Rec | -- | 70-130 | -- | | TO-15 | 11/08/2013 | MD |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1311026
**Project:** MVSC

**Client Sample ID:** SVE-4-110513
**Lab ID:** 1311026-005A
**Sample Type:** Summa Canister

**Date Sampled:** 11/5/2013
**Date Received:** 11/5/2013

| Analyte | Concentration (ppbv) | Concentration (ug/m³) | Reporting Limit (ppbv) | Reporting Limit (ug/m³) | Qual | Method | Date/Analyst | |
|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | | |
| Tetrachloroethene (PCE) | 60.8 | 412 | 0.300 | 2.03 | | TO-15 | 11/08/2013 | MD |
| Surr: 4-Bromofluorobenzene | 83.0 %Rec | -- | 70-130 | -- | | TO-15 | 11/08/2013 | MD |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1311026
**Project:** MVSC

**Client Sample ID:** SVE-10-110513
**Lab ID:** 1311026-006A
**Sample Type:** Summa Canister

**Date Sampled:** 11/5/2013
**Date Received:** 11/5/2013

| Analyte | Concentration (ppbv) | Concentration (ug/m³) | Reporting Limit (ppbv) | Reporting Limit (ug/m³) | Qual | Method | Date/Analyst | |
|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | | |
| Tetrachloroethene (PCE) | 104 | 709 | 0.300 | 2.03 | | TO-15 | 11/08/2013 | MD |
| Surr: 4-Bromofluorobenzene | 83.0 %Rec | -- | 70-130 | -- | | TO-15 | 11/08/2013 | MD |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1311026
**Project:** MVSC

**Client Sample ID:** SVE-8-110513
**Lab ID:** 1311026-007A
**Sample Type:** Summa Canister

**Date Sampled:** 11/5/2013
**Date Received:** 11/5/2013

| Analyte | Concentration | | Reporting Limit | | Qual | Method | Date/Analyst | |
|---|---|---|---|---|---|---|---|---|
| | (ppbv) | (ug/m³) | (ppbv) | (ug/m³) | | | | |
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | | |
| Tetrachloroethene (PCE) | 66.1 | 448 | 0.300 | 2.03 | | TO-15 | 11/08/2013 | MD |
| Surr: 4-Bromofluorobenzene | 83.2 %Rec | -- | 70-130 | -- | | TO-15 | 11/08/2013 | MD |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1311026
**Project:** MVSC

**Client Sample ID:** SVE-7-110513
**Lab ID:** 1311026-008A
**Sample Type:** Summa Canister

**Date Sampled:** 11/5/2013
**Date Received:** 11/5/2013

| Analyte | Concentration (ppbv) | Concentration (ug/m³) | Reporting Limit (ppbv) | Reporting Limit (ug/m³) | Qual | Method | Date/Analyst | |
|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | | |
| Tetrachloroethene (PCE) | 107 | 723 | 0.300 | 2.03 | | TO-15 | 11/08/2013 | MD |
| Surr: 4-Bromofluorobenzene | 83.5 %Rec | -- | 70-130 | -- | | TO-15 | 11/08/2013 | MD |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1311026
**Project:** MVSC

**Client Sample ID:** SVE-3-110513
**Lab ID:** 1311026-009A
**Sample Type:** Summa Canister

**Date Sampled:** 11/5/2013
**Date Received:** 11/5/2013

| Analyte | Concentration (ppbv) | Concentration (ug/m³) | Reporting Limit (ppbv) | Reporting Limit (ug/m³) | Qual | Method | Date/Analyst | |
|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | | |
| Tetrachloroethene (PCE) | 282 | 1,920 | 0.300 | 2.03 | | TO-15 | 11/08/2013 | MD |
| Surr: 4-Bromofluorobenzene | 83.0 %Rec | -- | 70-130 | -- | | TO-15 | 11/08/2013 | MD |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1311026
**Project:** MVSC

**Client Sample ID:** SVE-2-110513
**Lab ID:** 1311026-010A
**Sample Type:** Summa Canister

**Date Sampled:** 11/5/2013
**Date Received:** 11/5/2013

| Analyte | Concentration (ppbv) | Concentration (ug/m³) | Reporting Limit (ppbv) | Reporting Limit (ug/m³) | Qual | Method | Date/Analyst | |
|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | | |
| Tetrachloroethene (PCE) | 144 | 977 | 0.300 | 2.03 | | TO-15 | 11/08/2013 | MD |
| Surr: 4-Bromofluorobenzene | 82.9 %Rec | -- | 70-130 | -- | | TO-15 | 11/08/2013 | MD |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1311026
**Project:** MVSC

**Client Sample ID:** SYS-1113
**Lab ID:** 1311026-011A
**Sample Type:** Summa Canister

**Date Sampled:** 11/5/2013
**Date Received:** 11/5/2013

| Analyte | Concentration (ppbv) | Concentration (ug/m³) | Reporting Limit (ppbv) | Reporting Limit (ug/m³) | Qual | Method | Date/Analyst | |
|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | | |
| Tetrachloroethene (PCE) | 108 | 733 | 0.300 | 2.03 | | TO-15 | 11/08/2013 | MD |
| Surr: 4-Bromofluorobenzene | 82.4 %Rec | -- | 70-130 | -- | | TO-15 | 11/08/2013 | MD |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

**Work Order:** 1311026
**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method TO-15

| Sample ID: **MBLK-R10989** | SampType: **MBLK** | | | Units: **ppbv** | | Prep Date: **11/7/2013** | | RunNo: **10989** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **MBLKW** | Batch ID: **R10989** | | | | | Analysis Date: **11/7/2013** | | SeqNo: **219539** | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Tetrachloroethene (PCE) | ND | 0.300 | | | | | | | | | |
| Surr: 4-Bromofluorobenzene | 8.30 | | 10.00 | | 83.0 | 70 | 130 | | | | |

| Sample ID: **LCS-B-R10989** | SampType: **LCS** | | | Units: **ppbv** | | Prep Date: **11/8/2013** | | RunNo: **10989** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **LCSW** | Batch ID: **R10989** | | | | | Analysis Date: **11/8/2013** | | SeqNo: **219552** | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Tetrachloroethene (PCE) | 4.95 | 0.300 | 5.000 | 0 | 99.0 | 70 | 130 | | | | |
| Surr: 4-Bromofluorobenzene | 9.30 | | 10.00 | | 93.0 | 70 | 130 | | | | |

| Sample ID: **1311026-011REP** | SampType: **REP** | | | Units: **ppbv** | | Prep Date: **11/8/2013** | | RunNo: **10989** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **BATCH** | Batch ID: **R10989** | | | | | Analysis Date: **11/8/2013** | | SeqNo: **219564** | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| Tetrachloroethene (PCE) | 109 | 0.300 | | | | | | 108.1 | 0.887 | 30 | |
| Surr: 4-Bromofluorobenzene | 133 | | 160.0 | | 82.9 | 70 | 130 | | 0 | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

# Sample Log-In Check List

| | | | |
|---|---|---|---|
| Client Name: | **PES** | Work Order Number: | **1311026** |
| Logged by: | **Clare Griggs** | Date Received: | **11/5/2013 2:00:00 PM** |

## *Chain of Custody*

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

## *Log In*

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

## *Special Handling (if applicable)*

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

| | | | |
|---|---|---|---|
| Person Notified: | | Date: | |
| By Whom: | | Via: | ☐ eMail ☐ Phone ☐ Fax ☐ In Person |
| Regarding: | | | |
| Client Instructions: | | | |

19. Additional remarks:

**Item Information**

# Air Chain of Custody Record

**Fremont Analytical**

3600 Fremont Ave N
Seattle, WA 98103

Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (internal): 1311026

Date: 11-5-13

Page: 1 of: 2

Client: PES Environmental
Address: 1215 4th Avenue Suite 1350
City, State, Zip: Seattle, WA 98161
Tel: 206-529-3980
Reports To (PM): Matt Dahl
Email: MDahl@pesenv.com

Project Name: MVSC
Location: Normandy Park, WA
Collected by: Kirsten Springstead
Project No: 1358.001.01.007

| | Sample Name | Canister Serial # | Sample Date | Sample Time | Indoor/ Outdoor | Sample Volume | Container Type | Lab Cert. Vacuum Pressure | Field Initial Sample Pressure | Field Final Sample Pressure | Analysis Requested | Internal: Receipt Date | Internal: Final (psi) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SVE-9-110513 | 12665 | 11-5-13 | 1215 | OUTDOOR | 6L | Summa | 10mtorr | -29 Hg | -5 Hg | PCE by TO-15 | | |
| 2 | SVE-1-110513 | 12666 | | 1245 | | | Summa | 10mtorr | -30 Hg | -4 Hg | | | |
| 3 | SVE-6-110513 | 12667 | | 1140 | | | Summa | 10mtorr | -30 Hg | -5 Hg | | | |
| 4 | SVE-5-110513 | 12668 | | 1130 | | | Summa | 10mtorr | -30 Hg | -5 Hg | | | |
| 5 | ~~SVE~~ | 12669 | | | | | ~~Summa~~ | ~~10mtorr~~ | | | | | |
| 6 | SVE-4-110513 | 12670 | | 1115 | | | Summa | 10mtorr | -30 Hg | -5 Hg | | | |
| 7 | SVE-10-110513 | 12672 | | 1230 | | | Summa | 10mtorr | -30 Hg | -5 Hg | | | |
| 8 | SVE-8-110513 | 13967 | | 1200 | | | Summa | 10mtorr | -29 Hg | -5 Hg | | | |
| 9 | SVE-7-110513 | 13968 | | 1150 | | | Summa | 10mtorr | -30 Hg | -5 Hg | | | |
| 10 | SVE-4-110513 | 13970 | | 1115 | | | Summa | 10mtorr | -30 Hg | -5 Hg | | | |

Condition:

Seals Intact: Y N N/A

Special Remarks: Report to NWLS EDD in EIM Format

| Relinquished | Date/Time | Received | Date/Time |
|---|---|---|---|
| x | 11-5-13/1400 | x | 11.5.13 1400 |
| Relinquished | Date/Time | Received | Date/Time |
| x | | x | |

TAT --> (STD) Rush (specify)

# Air Chain of Custody Record

**Fremont Analytical**

3600 Fremont Ave N
Seattle, WA 98103

Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (Internal): 1311026

Date: 11-5-13

Page: 2 of 2

Client: PES Environmental

Address: 1215 4th Avenue Suite 1350

City, State, Zip: Seattle, WA 98161

Tel: 206-529-3580

Reports To (PM): Dahl, Matt

Email: MDahl@pesenv.com

Project Name: MVSC

Location: Normandy Park, WA

Collected by: Karsten Springstead

Project No: 1358.001.01.007

| | Sample Name | Canister Serial # | Sample Date | Sample Time | Indoor/ Outdoor | Sample Volume | Container Type | Lab Cert. Vacuum Pressure | Field Initial Sample Pressure | Field Final Sample Pressure | Analysis Requested | Internal: Receipt Date | Internal: Final (psi) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SVE-2-110513 | 13973 | 11-5-13 | 1300 | OUTDOOR | 6L | Summa | 10mtorr | -30 Hg | -5 Hg | PCE ONLY by TO-15 | | |
| 2 | SVS-1113 | 13975 | 11-5-13 | 1045 | OUTDOOR | 6L | Summa | 10mtorr | -30 Hg | -5 Hg | TO-15 PCE only | | |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

Condition:

Seals Intact: Y N N/A

| Relinquished | Date/Time | Received | Date/Time |
|---|---|---|---|
| x | | x | 11.5.13 1402 |
| Relinquished | Date/Time | Received | Date/Time |
| x | | x | |

Special Remarks:
Report to MRLs
EDD in EIM Format

TAT --> (STD) Rush (specify)

# Fremont Analytical

# Air Chain of Custody Record

3600 Fremont Ave N
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (Internal): 1311026

Date: 11-5-13

Page: 1 of: 2

Client: PES Environmental

Address: 1215 4th Avenue Suite 1350

City, State, Zip: Seattle, WA 98161 Tel: 206-529-3590

Reports To (PM): Matt Duh Email: MDuh@pesenv.com

Project Name: MVSC

Location: Normandy Park, WA

Collected by: Kirsten Springstead

Project No: 1358.001.01.007

| | Sample Name | Canister Serial # | Sample Date | Sample Time | Indoor/ Outdoor | Sample Volume | Container Type | Lab Cert. Vacuum Pressure | Field Initial Sample Pressure | Field Final Sample Pressure | Analysis Requested | Internal: Receipt Date | Internal: Final (psi) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SVE-9-110513 | 12665 | 11-5-13 | 1215 | outdoor | 6L | Summa | 10mtorr | -29 Hg | -5 Hg | PCE by TO-15 | | |
| 2 | SVE-1-110513 | 12666 | | 1245 | | | Summa | 10mtorr | -30 Hg | -4 Hg | | | |
| 3 | SVE-6-110513 | 12667 | | 1140 | | | Summa | 10mtorr | -30 Hg | -5 Hg | | | |
| 4 | SVE-5-110513 | 12668 | | 1130 | | | Summa | 10mtorr | -30 Hg | -5 Hg | | | |
| 5 | ~~SVE~~ | ~~12669~~ | | | | | ~~Summa~~ | ~~10mtorr~~ | | | | | |
| 6 | SVE-4-110513 | 12670 | | 1115 | | | Summa | 10mtorr | -30 Hg | -5 Hg | | | |
| 7 | SVE-10-110513 | 12672 | | 1230 | | | Summa | 10mtorr | -30 Hg | -5 Hg | | | |
| 8 | SVE-8-110513 | 13967 | | 1200 | | | Summa | 10mtorr | -29 Hg | -5 Hg | | | |
| 9 | SVE-7-110513 | 13968 | | 1150 | | | Summa | 10mtorr | -30 Hg | -5 Hg | | | |
| 10 | SVE-3-110513 | 13970 | | 1100 1115 | | | Summa | 10mtorr | -30 Hg | -5 Hg | | | |

Condition:

Seals Intact: Y N N/A

Special Remarks: Rush to MRLS
EDD in EIM Format

| Relinquished | Date/Time | Received | Date/Time |
|---|---|---|---|
| x | 11-5-13/1400 | x | 11.5.13 1400 |
| Relinquished | Date/Time | Received | Date/Time |
| x | | x | |

TAT -> STD Rush (specify)

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

**PES Environmental, Inc.**
Matt Dahl
1215 Fourth Avenue, Suite 1350
Seattle, WA 98161

**RE: MVSC**
**Lab ID: 1403142**

March 20, 2014

**Attention Matt Dahl:**

Fremont Analytical, Inc. received 1 sample(s) on 3/13/2014 for the analyses presented in the following report.

***Volatile Organic Compounds by EPA Method TO-15***

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Michael Dee
Sr. Chemist / Principal

**Date:** *03/20/2014*

**CLIENT:** PES Environmental, Inc.
**Project:** MVSC
**Lab Order:** 1403142

# Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Date/Time Collected | Date/Time Received |
|---|---|---|---|
| 1403142-001 | SYS-0314 | 03/13/2014 1:00 PM | 03/13/2014 2:45 PM |

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

# Case Narrative

WO#: **1403142**
Date: **3/20/2014**

**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

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

II. GENERAL REPORTING COMMENTS:
Air samples are reported in ppbv and ug/m3.

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

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

**Client:** **PES Environmental, Inc.**
**WorkOrder:** 1403142
**Project:** MVSC

**Client Sample ID:** SYS-0314
**Lab ID:** 1403142-001A
**Sample Type:** Summa Canister

**Date Sampled:** 3/13/2014
**Date Received:** 3/13/2014

| Analyte | Concentration | | Reporting Limit | | Qual | Method | Date/Analyst | |
|---|---|---|---|---|---|---|---|---|
| | (ppbv) | (ug/m³) | (ppbv) | (ug/m³) | | | | |
| **Volatile Organic Compounds by EPA Method TO-15** | | | | | | | | |
| Tetrachloroethene (PCE) | 53.9 | 366 | 0.300 | 2.03 | | TO-15 | 03/14/2014 | SG |
| Surr: 4-Bromofluorobenzene | 101 %Rec | -- | 70-130 | -- | | TO-15 | 03/14/2014 | SG |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |

**Date:** *3/20/2014*

**Work Order:** 1403142
**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method TO-15

| Sample ID: **1403131-001AREP** | SampType: **REP** | Units: **ppbv** | Prep Date: **3/14/2014** | RunNo: **13079** |
|---|---|---|---|---|
| Client ID: **BATCH** | Batch ID: **R13079** | | Analysis Date: **3/14/2014** | SeqNo: **261822** |

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene (PCE) | 1.27 | 0.300 | | | | | | 1.306 | 2.93 | 30 | |
| Surr: 4-Bromofluorobenzene | 10.2 | | 10.00 | | 102 | 70 | 130 | | 0 | | |

| Sample ID: **LCS-R13079B** | SampType: **LCS** | Units: **ppbv** | Prep Date: **3/14/2014** | RunNo: **13079** |
|---|---|---|---|---|
| Client ID: **LCSW** | Batch ID: **R13079** | | Analysis Date: **3/14/2014** | SeqNo: **261830** |

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene (PCE) | 4.24 | 0.300 | 5.000 | 0 | 84.7 | 70 | 130 | | | | |
| Surr: 4-Bromofluorobenzene | 10.5 | | 10.00 | | 105 | 70 | 130 | | | | |

| Sample ID: **MB-R13079** | SampType: **MBLK** | Units: **ppbv** | Prep Date: **3/14/2014** | RunNo: **13079** |
|---|---|---|---|---|
| Client ID: **MBLKW** | Batch ID: **R13079** | | Analysis Date: **3/14/2014** | SeqNo: **261831** |

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene (PCE) | ND | 0.300 | | | | | | | | | |
| Surr: 4-Bromofluorobenzene | 9.88 | | 10.00 | | 98.8 | 70 | 130 | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

# Sample Log-In Check List

| | | | |
|---|---|---|---|
| Client Name: | **PES** | Work Order Number: | **1403142** |
| Logged by: | **Clare Griggs** | Date Received: | **3/13/2014 2:45:00 PM** |

## Chain of Custody

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

## Log In

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

## Special Handling (if applicable)

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

Person Notified: _____ Date: _____

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

Regarding: _____

Client Instructions: _____

19. Additional remarks:

**Item Information**

# Fremont Analytical

# Air Chain of Custody Record

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (internal): 1403142

Date: 3-13-14

Page: 1 of: 1

Client: PES

Address: 1215 4th Avenue Ste. 1350

City, State, Zip: Seattle, WA 98161

Tel: 206-624-3980

Reports To (PM): Matt Dahl

Email: MDahl@pesenv.com

Project Name: MUSC

Location: Normandy Park, WA

Collected by: K. Springstead

Project No: 1358.001.01.007

| | Sample Name | Canister Serial # | Sample Date | Sample Time | Indoor/ Outdoor | Sample Volume | Container Type | Lab Cert. Vacuum Pressure | Field Initial Sample Pressure | Field Final Sample Pressure | Analysis Requested | Internal: Receipt Date | Internal: Final (psi) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SVS-0314 | ~~12075~~ 12673 | 3-13-14 | 1300 | OUTDOOR | 6L | Summa | 10mtorr | 30 | 3 | TO-15 "PCE ONLY" | 3/13 | -3 |
| 2 | | ~~10072~~ | | | | | ~~Summa~~ | ~~10mtorr~~ | | | | | |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

Condition:

Seals Intact: Y N N/A

Relinquished x [signature] Date/Time 3-13-14/1445

Received x [signature] Date/Time 3/13/14 1445

Relinquished x Date/Time

Received x Date/Time

Special Remarks: Report to MRLs
EDD in EIM format

TAT -> (STD) Rush (specify)

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

**PES Environmental, Inc.**
Matt Dahl
1215 Fourth Avenue, Suite 1350
Seattle, WA 98161

**RE: MVSC**
**Lab ID: 1402176**

February 26, 2014

**Attention Matt Dahl:**

Fremont Analytical, Inc. received 1 sample(s) on 2/19/2014 for the analyses presented in the following report.

***Volatile Organic Compounds by EPA Method 8260***

This report consists of the following:

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

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

Thank you for using Fremont Analytical.

Sincerely,

Michael Dee
Sr. Chemist / Principal

**Date:** *02/26/2014*

**CLIENT:** PES Environmental, Inc.
**Project:** MVSC
**Lab Order:** 1402176

# Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Date/Time Collected | Date/Time Received |
|---|---|---|---|
| 1402176-001 | Drum-Water | 02/19/2014 9:00 AM | 02/19/2014 10:45 AM |

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

# Case Narrative

WO#: **1402176**
Date: **2/26/2014**

**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

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

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

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

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

# Analytical Report

WO#: **1402176**
Date Reported: **2/26/2014**

**Client:** PES Environmental, Inc.
**Collection Date:** 2/19/2014 9:00:00 AM
**Project:** MVSC
**Lab ID:** 1402176-001
**Matrix:** Water
**Client Sample ID:** **Drum-Water**

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method 8260** | | | | Batch ID: R12635 | | Analyst: EM |
| Dichlorodifluoromethane (CFC-12) | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Chloromethane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Vinyl chloride | ND | 0.200 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Bromomethane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Trichlorofluoromethane (CFC-11) | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Chloroethane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,1-Dichloroethene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Methylene chloride | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| trans-1,2-Dichloroethene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Methyl tert-butyl ether (MTBE) | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,1-Dichloroethane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 2,2-Dichloropropane | ND | 2.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| cis-1,2-Dichloroethene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Chloroform | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,1,1-Trichloroethane (TCA) | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,1-Dichloropropene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Carbon tetrachloride | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,2-Dichloroethane (EDC) | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Benzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Trichloroethene (TCE) | ND | 0.500 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,2-Dichloropropane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Bromodichloromethane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Dibromomethane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| cis-1,3-Dichloropropene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Toluene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| trans-1,3-Dichloropropene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,1,2-Trichloroethane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,3-Dichloropropane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Tetrachloroethene (PCE) | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Dibromochloromethane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,2-Dibromoethane (EDB) | ND | 0.0600 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Chlorobenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,1,1,2-Tetrachloroethane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Ethylbenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| m,p-Xylene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

# Analytical Report

WO#: **1402176**
Date Reported: **2/26/2014**

**Client:** PES Environmental, Inc.
**Collection Date:** 2/19/2014 9:00:00 AM
**Project:** MVSC
**Lab ID:** 1402176-001
**Matrix:** Water
**Client Sample ID:** **Drum-Water**

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **Volatile Organic Compounds by EPA Method 8260** | | | | Batch ID: R12635 | | Analyst: EM |
| o-Xylene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Styrene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Isopropylbenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Bromoform | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,1,2,2-Tetrachloroethane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| n-Propylbenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Bromobenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,3,5-Trimethylbenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 2-Chlorotoluene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 4-Chlorotoluene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| tert-Butylbenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,2,3-Trichloropropane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,2,4-Trichlorobenzene | ND | 2.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| sec-Butylbenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 4-Isopropyltoluene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,3-Dichlorobenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,4-Dichlorobenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| n-Butylbenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,2-Dichlorobenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,2-Dibromo-3-chloropropane | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,2,4-Trimethylbenzene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Hexachlorobutadiene | ND | 4.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Naphthalene | ND | 1.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| 1,2,3-Trichlorobenzene | ND | 4.00 | | µg/L | 1 | 2/20/2014 5:33:00 PM |
| Surr: Dibromofluoromethane | 100 | 72.1-122 | | %REC | 1 | 2/20/2014 5:33:00 PM |
| Surr: Toluene-d8 | 99.6 | 62.1-129 | | %REC | 1 | 2/20/2014 5:33:00 PM |
| Surr: 1-Bromo-4-fluorobenzene | 110 | 66.8-124 | | %REC | 1 | 2/20/2014 5:33:00 PM |

**Qualifiers:**

| | | | |
|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1402176
**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **MB-R12635** SampType: **MBLK** Units: **µg/L** Prep Date: **2/20/2014** RunNo: **12635**
Client ID: **MBLKW** Batch ID: **R12635** Analysis Date: **2/20/2014** SeqNo: **252200**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane (CFC-12) | ND | 1.00 | | | | | | | | | |
| Chloromethane | ND | 1.00 | | | | | | | | | |
| Vinyl chloride | ND | 0.200 | | | | | | | | | |
| Bromomethane | ND | 1.00 | | | | | | | | | |
| Trichlorofluoromethane (CFC-11) | ND | 1.00 | | | | | | | | | |
| Chloroethane | ND | 1.00 | | | | | | | | | |
| 1,1-Dichloroethene | ND | 1.00 | | | | | | | | | |
| Methylene chloride | ND | 1.00 | | | | | | | | | |
| trans-1,2-Dichloroethene | ND | 1.00 | | | | | | | | | |
| Methyl tert-butyl ether (MTBE) | ND | 1.00 | | | | | | | | | |
| 1,1-Dichloroethane | ND | 1.00 | | | | | | | | | |
| 2,2-Dichloropropane | ND | 2.00 | | | | | | | | | |
| cis-1,2-Dichloroethene | ND | 1.00 | | | | | | | | | |
| Chloroform | ND | 1.00 | | | | | | | | | |
| 1,1,1-Trichloroethane (TCA) | ND | 1.00 | | | | | | | | | |
| 1,1-Dichloropropene | ND | 1.00 | | | | | | | | | |
| Carbon tetrachloride | ND | 1.00 | | | | | | | | | |
| 1,2-Dichloroethane (EDC) | ND | 1.00 | | | | | | | | | |
| Benzene | ND | 1.00 | | | | | | | | | |
| Trichloroethene (TCE) | ND | 0.500 | | | | | | | | | |
| 1,2-Dichloropropane | ND | 1.00 | | | | | | | | | |
| Bromodichloromethane | ND | 1.00 | | | | | | | | | |
| Dibromomethane | ND | 1.00 | | | | | | | | | |
| cis-1,3-Dichloropropene | ND | 1.00 | | | | | | | | | |
| Toluene | ND | 1.00 | | | | | | | | | |
| trans-1,3-Dichloropropene | ND | 1.00 | | | | | | | | | |
| 1,1,2-Trichloroethane | ND | 1.00 | | | | | | | | | |
| 1,3-Dichloropropane | ND | 1.00 | | | | | | | | | |
| Tetrachloroethene (PCE) | ND | 1.00 | | | | | | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1402176
**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **MB-R12635** SampType: **MBLK** Units: **µg/L** Prep Date: **2/20/2014** RunNo: **12635**
Client ID: **MBLKW** Batch ID: **R12635** Analysis Date: **2/20/2014** SeqNo: **252200**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dibromochloromethane | ND | 1.00 | | | | | | | | | |
| 1,2-Dibromoethane (EDB) | ND | 0.0600 | | | | | | | | | |
| Chlorobenzene | ND | 1.00 | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 1.00 | | | | | | | | | |
| Ethylbenzene | ND | 1.00 | | | | | | | | | |
| m,p-Xylene | ND | 1.00 | | | | | | | | | |
| o-Xylene | ND | 1.00 | | | | | | | | | |
| Styrene | ND | 1.00 | | | | | | | | | |
| Isopropylbenzene | ND | 1.00 | | | | | | | | | |
| Bromoform | ND | 1.00 | | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 1.00 | | | | | | | | | |
| n-Propylbenzene | ND | 1.00 | | | | | | | | | |
| Bromobenzene | ND | 1.00 | | | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 1.00 | | | | | | | | | |
| 2-Chlorotoluene | ND | 1.00 | | | | | | | | | |
| 4-Chlorotoluene | ND | 1.00 | | | | | | | | | |
| tert-Butylbenzene | ND | 1.00 | | | | | | | | | |
| 1,2,3-Trichloropropane | ND | 1.00 | | | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 2.00 | | | | | | | | | |
| sec-Butylbenzene | ND | 1.00 | | | | | | | | | |
| 4-Isopropyltoluene | ND | 1.00 | | | | | | | | | |
| 1,3-Dichlorobenzene | ND | 1.00 | | | | | | | | | |
| 1,4-Dichlorobenzene | ND | 1.00 | | | | | | | | | |
| n-Butylbenzene | ND | 1.00 | | | | | | | | | |
| 1,2-Dichlorobenzene | ND | 1.00 | | | | | | | | | |
| 1,2-Dibromo-3-chloropropane | ND | 1.00 | | | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 1.00 | | | | | | | | | |
| Hexachlorobutadiene | ND | 4.00 | | | | | | | | | |
| Naphthalene | ND | 1.00 | | | | | | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

Fremont Analytical

**Date:** *2/26/2014*

**Work Order:** 1402176
**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

| Sample ID: **MB-R12635** | SampType: **MBLK** | Units: **µg/L** | Prep Date: **2/20/2014** | RunNo: **12635** |
|---|---|---|---|---|
| Client ID: **MBLKW** | Batch ID: **R12635** | | Analysis Date: **2/20/2014** | SeqNo: **252200** |

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,3-Trichlorobenzene | ND | 4.00 | | | | | | | | | |
| Surr: Dibromofluoromethane | 52.2 | | 50.00 | | 104 | 72.1 | 122 | | | | |
| Surr: Toluene-d8 | 52.7 | | 50.00 | | 105 | 62.1 | 129 | | | | |
| Surr: 1-Bromo-4-fluorobenzene | 53.2 | | 50.00 | | 106 | 66.8 | 124 | | | | |

| Sample ID: **1402197-001ADUP** | SampType: **DUP** | Units: **µg/L** | Prep Date: **2/20/2014** | RunNo: **12635** |
|---|---|---|---|---|
| Client ID: **BATCH** | Batch ID: **R12635** | | Analysis Date: **2/20/2014** | SeqNo: **252269** |

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane (CFC-12) | ND | 1.00 | | | | | | 0 | | 30 | |
| Chloromethane | ND | 1.00 | | | | | | 0 | | 30 | |
| Vinyl chloride | ND | 0.200 | | | | | | 0 | | 30 | |
| Bromomethane | ND | 1.00 | | | | | | 0 | | 30 | |
| Trichlorofluoromethane (CFC-11) | ND | 1.00 | | | | | | 0 | | 30 | |
| Chloroethane | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,1-Dichloroethene | ND | 1.00 | | | | | | 0 | | 30 | |
| Methylene chloride | ND | 1.00 | | | | | | 0 | | 30 | |
| trans-1,2-Dichloroethene | ND | 1.00 | | | | | | 0 | | 30 | |
| Methyl tert-butyl ether (MTBE) | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,1-Dichloroethane | ND | 1.00 | | | | | | 0 | | 30 | |
| 2,2-Dichloropropane | ND | 2.00 | | | | | | 0 | | 30 | |
| cis-1,2-Dichloroethene | ND | 1.00 | | | | | | 0 | | 30 | |
| Chloroform | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,1,1-Trichloroethane (TCA) | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,1-Dichloropropene | ND | 1.00 | | | | | | 0 | | 30 | |
| Carbon tetrachloride | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,2-Dichloroethane (EDC) | ND | 1.00 | | | | | | 0 | | 30 | |
| Benzene | ND | 1.00 | | | | | | 0 | | 30 | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1402176
**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **1402197-001ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **2/20/2014** RunNo: **12635**
Client ID: **BATCH** Batch ID: **R12635** Analysis Date: **2/20/2014** SeqNo: **252269**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Trichloroethene (TCE) | ND | 0.500 | | | | | | 0 | | 30 | |
| 1,2-Dichloropropane | ND | 1.00 | | | | | | 0 | | 30 | |
| Bromodichloromethane | ND | 1.00 | | | | | | 0 | | 30 | |
| Dibromomethane | ND | 1.00 | | | | | | 0 | | 30 | |
| cis-1,3-Dichloropropene | ND | 1.00 | | | | | | 0 | | 30 | |
| Toluene | ND | 1.00 | | | | | | 0 | | 30 | |
| trans-1,3-Dichloropropene | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,1,2-Trichloroethane | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,3-Dichloropropane | ND | 1.00 | | | | | | 0 | | 30 | |
| Tetrachloroethene (PCE) | ND | 1.00 | | | | | | 0 | | 30 | |
| Dibromochloromethane | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,2-Dibromoethane (EDB) | ND | 0.0600 | | | | | | 0 | | 30 | |
| Chlorobenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,1,1,2-Tetrachloroethane | ND | 1.00 | | | | | | 0 | | 30 | |
| Ethylbenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| m,p-Xylene | ND | 1.00 | | | | | | 0 | | 30 | |
| o-Xylene | ND | 1.00 | | | | | | 0 | | 30 | |
| Styrene | ND | 1.00 | | | | | | 0 | | 30 | |
| Isopropylbenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| Bromoform | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,1,2,2-Tetrachloroethane | ND | 1.00 | | | | | | 0 | | 30 | |
| n-Propylbenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| Bromobenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,3,5-Trimethylbenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| 2-Chlorotoluene | ND | 1.00 | | | | | | 0 | | 30 | |
| 4-Chlorotoluene | ND | 1.00 | | | | | | 0 | | 30 | |
| tert-Butylbenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,2,3-Trichloropropane | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,2,4-Trichlorobenzene | ND | 2.00 | | | | | | 0 | | 30 | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1402176
**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **1402197-001ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **2/20/2014** RunNo: **12635**
Client ID: **BATCH** Batch ID: **R12635** Analysis Date: **2/20/2014** SeqNo: **252269**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| sec-Butylbenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| 4-Isopropyltoluene | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,3-Dichlorobenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,4-Dichlorobenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| n-Butylbenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,2-Dichlorobenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,2-Dibromo-3-chloropropane | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,2,4-Trimethylbenzene | ND | 1.00 | | | | | | 0 | | 30 | |
| Hexachlorobutadiene | ND | 4.00 | | | | | | 0 | | 30 | |
| Naphthalene | ND | 1.00 | | | | | | 0 | | 30 | |
| 1,2,3-Trichlorobenzene | ND | 4.00 | | | | | | 0 | | 30 | |
| Surr: Dibromofluoromethane | 52.7 | | 50.00 | | 105 | 72.1 | 122 | | 0 | | |
| Surr: Toluene-d8 | 51.3 | | 50.00 | | 103 | 62.1 | 129 | | 0 | | |
| Surr: 1-Bromo-4-fluorobenzene | 55.2 | | 50.00 | | 110 | 66.8 | 124 | | 0 | | |

Sample ID: **1402197-006AMS** SampType: **MS** Units: **µg/L** Prep Date: **2/20/2014** RunNo: **12635**
Client ID: **BATCH** Batch ID: **R12635** Analysis Date: **2/20/2014** SeqNo: **252272**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane (CFC-12) | 32.3 | 1.00 | 20.00 | 0 | 162 | 33.3 | 122 | | | | S |
| Chloromethane | 25.9 | 1.00 | 20.00 | 1.560 | 122 | 48.2 | 145 | | | | |
| Vinyl chloride | 25.3 | 0.200 | 20.00 | 0 | 126 | 45.6 | 149 | | | | |
| Bromomethane | 22.5 | 1.00 | 20.00 | 0 | 113 | 31.5 | 135 | | | | |
| Trichlorofluoromethane (CFC-11) | 23.5 | 1.00 | 20.00 | 0 | 118 | 54.7 | 138 | | | | |
| Chloroethane | 21.5 | 1.00 | 20.00 | 0 | 107 | 49.9 | 143 | | | | |
| 1,1-Dichloroethene | 27.1 | 1.00 | 20.00 | 0 | 136 | 63 | 141 | | | | |
| Methylene chloride | 25.2 | 1.00 | 20.00 | 0 | 126 | 61.6 | 135 | | | | |
| trans-1,2-Dichloroethene | 25.3 | 1.00 | 20.00 | 0 | 126 | 63.5 | 138 | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1402176
**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **1402197-006AMS** SampType: **MS** Units: **µg/L** Prep Date: **2/20/2014** RunNo: **12635**
Client ID: **BATCH** Batch ID: **R12635** Analysis Date: **2/20/2014** SeqNo: **252272**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Methyl tert-butyl ether (MTBE) | 24.5 | 1.00 | 20.00 | 0 | 122 | 60.9 | 132 | | | | |
| 1,1-Dichloroethane | 25.5 | 1.00 | 20.00 | 0 | 127 | 67.8 | 136 | | | | |
| 2,2-Dichloropropane | 35.4 | 2.00 | 20.00 | 0 | 177 | 31.5 | 121 | | | | S |
| cis-1,2-Dichloroethene | 25.5 | 1.00 | 20.00 | 0 | 128 | 67.1 | 123 | | | | S |
| Chloroform | 25.4 | 1.00 | 20.00 | 0 | 127 | 66.7 | 136 | | | | |
| 1,1,1-Trichloroethane (TCA) | 26.0 | 1.00 | 20.00 | 0 | 130 | 64.2 | 146 | | | | |
| 1,1-Dichloropropene | 27.0 | 1.00 | 20.00 | 0 | 135 | 73.8 | 136 | | | | |
| Carbon tetrachloride | 28.2 | 1.00 | 20.00 | 0 | 141 | 62.7 | 146 | | | | |
| 1,2-Dichloroethane (EDC) | 24.8 | 1.00 | 20.00 | 0 | 124 | 63.4 | 137 | | | | |
| Benzene | 25.2 | 1.00 | 20.00 | 0 | 126 | 65.4 | 138 | | | | |
| Trichloroethene (TCE) | 25.9 | 0.500 | 20.00 | 0 | 130 | 60.4 | 134 | | | | |
| 1,2-Dichloropropane | 23.7 | 1.00 | 20.00 | 0 | 118 | 62.6 | 138 | | | | |
| Bromodichloromethane | 24.6 | 1.00 | 20.00 | 0 | 123 | 59.4 | 139 | | | | |
| Dibromomethane | 25.4 | 1.00 | 20.00 | 0 | 127 | 63.6 | 139 | | | | |
| cis-1,3-Dichloropropene | 25.5 | 1.00 | 20.00 | 0 | 128 | 63.8 | 132 | | | | |
| Toluene | 24.6 | 1.00 | 20.00 | 0 | 123 | 64 | 139 | | | | |
| trans-1,3-Dichloropropene | 24.7 | 1.00 | 20.00 | 0 | 123 | 57.7 | 125 | | | | |
| 1,1,2-Trichloroethane | 23.9 | 1.00 | 20.00 | 0 | 120 | 59.4 | 127 | | | | |
| 1,3-Dichloropropane | 23.9 | 1.00 | 20.00 | 0 | 119 | 64.3 | 135 | | | | |
| Tetrachloroethene (PCE) | 26.1 | 1.00 | 20.00 | 0 | 130 | 50.3 | 133 | | | | |
| Dibromochloromethane | 23.9 | 1.00 | 20.00 | 0 | 120 | 61.6 | 139 | | | | |
| 1,2-Dibromoethane (EDB) | 23.7 | 0.0600 | 20.00 | 0 | 119 | 63.2 | 134 | | | | |
| Chlorobenzene | 23.8 | 1.00 | 20.00 | 0 | 119 | 65.8 | 134 | | | | |
| 1,1,1,2-Tetrachloroethane | 23.7 | 1.00 | 20.00 | 0 | 118 | 65.4 | 135 | | | | |
| Ethylbenzene | 25.1 | 1.00 | 20.00 | 0 | 126 | 64.5 | 136 | | | | |
| m,p-Xylene | 49.3 | 1.00 | 40.00 | 0 | 123 | 63.3 | 135 | | | | |
| o-Xylene | 24.0 | 1.00 | 20.00 | 0 | 120 | 65.4 | 134 | | | | |
| Styrene | 23.9 | 1.00 | 20.00 | 0 | 120 | 59.1 | 134 | | | | |
| Isopropylbenzene | 24.7 | 1.00 | 20.00 | 0 | 123 | 56 | 147 | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1402176
**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **1402197-006AMS** SampType: **MS** Units: **µg/L** Prep Date: **2/20/2014** RunNo: **12635**
Client ID: **BATCH** Batch ID: **R12635** Analysis Date: **2/20/2014** SeqNo: **252272**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromoform | 28.4 | 1.00 | 20.00 | 0 | 142 | 57.7 | 139 | | | | S |
| 1,1,2,2-Tetrachloroethane | 24.6 | 1.00 | 20.00 | 0 | 123 | 59.8 | 146 | | | | |
| n-Propylbenzene | 25.6 | 1.00 | 20.00 | 0.2000 | 127 | 57.6 | 142 | | | | |
| Bromobenzene | 23.6 | 1.00 | 20.00 | 0 | 118 | 63.6 | 130 | | | | |
| 1,3,5-Trimethylbenzene | 24.7 | 1.00 | 20.00 | 0 | 124 | 59.9 | 136 | | | | |
| 2-Chlorotoluene | 25.0 | 1.00 | 20.00 | 0 | 125 | 61.7 | 134 | | | | |
| 4-Chlorotoluene | 25.1 | 1.00 | 20.00 | 0 | 126 | 58.4 | 134 | | | | |
| tert-Butylbenzene | 24.5 | 1.00 | 20.00 | 0 | 123 | 66.8 | 141 | | | | |
| 1,2,3-Trichloropropane | 24.7 | 1.00 | 20.00 | 0 | 123 | 62.4 | 129 | | | | |
| 1,2,4-Trichlorobenzene | 24.4 | 2.00 | 20.00 | 0 | 122 | 50.9 | 133 | | | | |
| sec-Butylbenzene | 25.6 | 1.00 | 20.00 | 0 | 128 | 56 | 146 | | | | |
| 4-Isopropyltoluene | 25.4 | 1.00 | 20.00 | 0 | 127 | 56.4 | 136 | | | | |
| 1,3-Dichlorobenzene | 24.4 | 1.00 | 20.00 | 0 | 122 | 58.2 | 128 | | | | |
| 1,4-Dichlorobenzene | 22.1 | 1.00 | 20.00 | 0 | 110 | 60.1 | 123 | | | | |
| n-Butylbenzene | 26.2 | 1.00 | 20.00 | 0 | 131 | 54.6 | 135 | | | | |
| 1,2-Dichlorobenzene | 22.9 | 1.00 | 20.00 | 0 | 114 | 65.4 | 133 | | | | |
| 1,2-Dibromo-3-chloropropane | 25.8 | 1.00 | 20.00 | 0 | 129 | 51.8 | 142 | | | | |
| 1,2,4-Trimethylbenzene | 24.5 | 1.00 | 20.00 | 0 | 123 | 63.7 | 132 | | | | |
| Hexachlorobutadiene | 24.0 | 4.00 | 20.00 | 0 | 120 | 58.1 | 130 | | | | |
| Naphthalene | 22.6 | 1.00 | 20.00 | 0 | 113 | 54.5 | 132 | | | | |
| 1,2,3-Trichlorobenzene | 24.0 | 4.00 | 20.00 | 0 | 120 | 57 | 131 | | | | |
| Surr: Dibromofluoromethane | 51.7 | | 50.00 | | 103 | 72.1 | 122 | | | | |
| Surr: Toluene-d8 | 51.6 | | 50.00 | | 103 | 62.1 | 129 | | | | |
| Surr: 1-Bromo-4-fluorobenzene | 55.8 | | 50.00 | | 112 | 66.8 | 124 | | | | |

**NOTES:**

S - Outlying QC recoveries were associated with this sample. The method is in control as indicated by the LCS.

**Work Order:** 1402176
**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **LCS-R12635** SampType: **LCS** Units: **µg/L** Prep Date: **2/20/2014** RunNo: **12635**
Client ID: **LCSW** Batch ID: **R12635** Analysis Date: **2/20/2014** SeqNo: **252273**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorodifluoromethane (CFC-12) | 32.9 | 1.00 | 20.00 | 0 | 164 | 43 | 136 | | | | S |
| Chloromethane | 23.9 | 1.00 | 20.00 | 0 | 119 | 43.9 | 139 | | | | |
| Vinyl chloride | 24.4 | 0.200 | 20.00 | 0 | 122 | 57.1 | 131 | | | | |
| Bromomethane | 19.7 | 1.00 | 20.00 | 0 | 98.3 | 44.8 | 148 | | | | |
| Trichlorofluoromethane (CFC-11) | 22.5 | 1.00 | 20.00 | 0 | 113 | 63.7 | 133 | | | | |
| Chloroethane | 22.1 | 1.00 | 20.00 | 0 | 111 | 53 | 141 | | | | |
| 1,1-Dichloroethene | 20.6 | 1.00 | 20.00 | 0 | 103 | 65.6 | 136 | | | | |
| Methylene chloride | 21.0 | 1.00 | 20.00 | 0 | 105 | 67.1 | 131 | | | | |
| trans-1,2-Dichloroethene | 20.1 | 1.00 | 20.00 | 0 | 101 | 71.7 | 129 | | | | |
| Methyl tert-butyl ether (MTBE) | 20.8 | 1.00 | 20.00 | 0 | 104 | 67.7 | 131 | | | | |
| 1,1-Dichloroethane | 21.0 | 1.00 | 20.00 | 0 | 105 | 67.9 | 134 | | | | |
| 2,2-Dichloropropane | 25.4 | 2.00 | 20.00 | 0 | 127 | 33.7 | 152 | | | | |
| cis-1,2-Dichloroethene | 21.5 | 1.00 | 20.00 | 0 | 108 | 71.1 | 130 | | | | |
| Chloroform | 21.6 | 1.00 | 20.00 | 0 | 108 | 76.7 | 124 | | | | |
| 1,1,1-Trichloroethane (TCA) | 21.0 | 1.00 | 20.00 | 0 | 105 | 71 | 131 | | | | |
| 1,1-Dichloropropene | 21.7 | 1.00 | 20.00 | 0 | 108 | 74.5 | 126 | | | | |
| Carbon tetrachloride | 22.7 | 1.00 | 20.00 | 0 | 113 | 66.2 | 134 | | | | |
| 1,2-Dichloroethane (EDC) | 21.6 | 1.00 | 20.00 | 0 | 108 | 70 | 129 | | | | |
| Benzene | 21.2 | 1.00 | 20.00 | 0 | 106 | 76 | 123 | | | | |
| Trichloroethene (TCE) | 21.4 | 0.500 | 20.00 | 0 | 107 | 65.2 | 136 | | | | |
| 1,2-Dichloropropane | 20.7 | 1.00 | 20.00 | 0 | 104 | 70.5 | 130 | | | | |
| Bromodichloromethane | 21.9 | 1.00 | 20.00 | 0 | 109 | 74.6 | 127 | | | | |
| Dibromomethane | 22.4 | 1.00 | 20.00 | 0 | 112 | 75.5 | 126 | | | | |
| cis-1,3-Dichloropropene | 22.3 | 1.00 | 20.00 | 0 | 112 | 62.6 | 137 | | | | |
| Toluene | 21.0 | 1.00 | 20.00 | 0 | 105 | 71.5 | 130 | | | | |
| trans-1,3-Dichloropropene | 21.6 | 1.00 | 20.00 | 0 | 108 | 58.5 | 142 | | | | |
| 1,1,2-Trichloroethane | 21.3 | 1.00 | 20.00 | 0 | 107 | 76 | 124 | | | | |
| 1,3-Dichloropropane | 21.1 | 1.00 | 20.00 | 0 | 105 | 73.5 | 127 | | | | |
| Tetrachloroethene (PCE) | 20.1 | 1.00 | 20.00 | 0 | 100 | 47.5 | 147 | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Work Order:** 1402176
**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

Sample ID: **LCS-R12635** SampType: **LCS** Units: **µg/L** Prep Date: **2/20/2014** RunNo: **12635**
Client ID: **LCSW** Batch ID: **R12635** Analysis Date: **2/20/2014** SeqNo: **252273**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dibromochloromethane | 20.9 | 1.00 | 20.00 | 0 | 104 | 67.2 | 134 | | | | |
| 1,2-Dibromoethane (EDB) | 21.7 | 0.0600 | 20.00 | 0 | 109 | 73.6 | 125 | | | | |
| Chlorobenzene | 20.1 | 1.00 | 20.00 | 0 | 100 | 73.9 | 126 | | | | |
| 1,1,1,2-Tetrachloroethane | 21.1 | 1.00 | 20.00 | 0 | 106 | 76.8 | 124 | | | | |
| Ethylbenzene | 20.6 | 1.00 | 20.00 | 0 | 103 | 72 | 130 | | | | |
| m,p-Xylene | 41.7 | 1.00 | 40.00 | 0 | 104 | 73 | 131 | | | | |
| o-Xylene | 21.6 | 1.00 | 20.00 | 0 | 108 | 72.1 | 131 | | | | |
| Styrene | 20.3 | 1.00 | 20.00 | 0 | 101 | 64.3 | 140 | | | | |
| Isopropylbenzene | 21.2 | 1.00 | 20.00 | 0 | 106 | 73.9 | 128 | | | | |
| Bromoform | 13.3 | 1.00 | 20.00 | 0 | 66.3 | 63.8 | 135 | | | | |
| 1,1,2,2-Tetrachloroethane | 21.6 | 1.00 | 20.00 | 0 | 108 | 62.9 | 132 | | | | |
| n-Propylbenzene | 21.7 | 1.00 | 20.00 | 0 | 109 | 74.5 | 127 | | | | |
| Bromobenzene | 19.8 | 1.00 | 20.00 | 0 | 99.0 | 71 | 131 | | | | |
| 1,3,5-Trimethylbenzene | 21.6 | 1.00 | 20.00 | 0 | 108 | 73.1 | 128 | | | | |
| 2-Chlorotoluene | 22.2 | 1.00 | 20.00 | 0 | 111 | 70.8 | 130 | | | | |
| 4-Chlorotoluene | 21.3 | 1.00 | 20.00 | 0 | 106 | 70.1 | 131 | | | | |
| tert-Butylbenzene | 21.0 | 1.00 | 20.00 | 0 | 105 | 68.2 | 131 | | | | |
| 1,2,3-Trichloropropane | 20.5 | 1.00 | 20.00 | 0 | 102 | 67.7 | 131 | | | | |
| 1,2,4-Trichlorobenzene | 20.4 | 2.00 | 20.00 | 0 | 102 | 72.4 | 127 | | | | |
| sec-Butylbenzene | 21.4 | 1.00 | 20.00 | 0 | 107 | 72 | 129 | | | | |
| 4-Isopropyltoluene | 21.4 | 1.00 | 20.00 | 0 | 107 | 69.2 | 130 | | | | |
| 1,3-Dichlorobenzene | 21.2 | 1.00 | 20.00 | 0 | 106 | 72.4 | 129 | | | | |
| 1,4-Dichlorobenzene | 19.2 | 1.00 | 20.00 | 0 | 95.8 | 70.6 | 128 | | | | |
| n-Butylbenzene | 21.5 | 1.00 | 20.00 | 0 | 107 | 73.8 | 127 | | | | |
| 1,2-Dichlorobenzene | 20.4 | 1.00 | 20.00 | 0 | 102 | 74.2 | 129 | | | | |
| 1,2-Dibromo-3-chloropropane | 24.6 | 1.00 | 20.00 | 0 | 123 | 63.1 | 136 | | | | |
| 1,2,4-Trimethylbenzene | 20.9 | 1.00 | 20.00 | 0 | 105 | 73.4 | 127 | | | | |
| Hexachlorobutadiene | 15.0 | 4.00 | 20.00 | 0 | 74.9 | 58.6 | 138 | | | | |
| Naphthalene | 20.4 | 1.00 | 20.00 | 0 | 102 | 62 | 136 | | | | |

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

**Date:** *2/26/2014*

**Work Order:** 1402176
**CLIENT:** PES Environmental, Inc.
**Project:** MVSC

# QC SUMMARY REPORT

## Volatile Organic Compounds by EPA Method 8260

| Sample ID: **LCS-R12635** | SampType: **LCS** | | | Units: **µg/L** | | Prep Date: **2/20/2014** | | RunNo: **12635** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: **LCSW** | Batch ID: **R12635** | | | | | Analysis Date: **2/20/2014** | | SeqNo: **252273** | | | |
| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
| 1,2,3-Trichlorobenzene | 20.7 | 4.00 | 20.00 | 0 | 104 | 66.4 | 132 | | | | |
| Surr: Dibromofluoromethane | 51.4 | | 50.00 | | 103 | 72.1 | 122 | | | | |
| Surr: Toluene-d8 | 51.1 | | 50.00 | | 102 | 62.1 | 129 | | | | |
| Surr: 1-Bromo-4-fluorobenzene | 54.7 | | 50.00 | | 109 | 66.8 | 124 | | | | |

**NOTES:**
S - Outlying spike recovery observed for Dichlorodifluoromethane - High Bias. There were no detections in the sample. No further action is required.

**Qualifiers:**

| | | | | | |
|---|---|---|---|---|---|
| B | Analyte detected in the associated Method Blank | D | Dilution was required | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits | ND | Not detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | RL | Reporting Limit | S | Spike recovery outside accepted recovery limits |

# Sample Log-In Check List

| | | | |
|---|---|---|---|
| Client Name: | **PES** | Work Order Number: | **1402176** |
| Logged by: | **Chelsea Ward** | Date Received: | **2/19/2014 10:45:00 AM** |

## Chain of Custody

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

## Log In

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

## Special Handling (if applicable)

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

| | | | |
|---|---|---|---|
| Person Notified: | | Date: | |
| By Whom: | | Via: | ☐ eMail ☐ Phone ☐ Fax ☐ In Person |
| Regarding: | | | |
| Client Instructions: | | | |

19. Additional remarks:

**Item Information**

# Fremont Analytical

## Chain of Custody Record

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (internal): 1402176

Date: 2-19-14

Page: 1 of: 1

Client: PES
Address: 1215 4th Avenue Ste 1350
City, State, Zip: Seattle, WA 98161 Tel: 206-523-3758
Reports To (PM): Matt Dahl Fax:

Project Name: MVSC
Location: Normandy Park, WA
Collected by: K. Springstead
Email: MDahl@pesenv.com Project No: 1358.001.01.007

*Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, WW = Waste Water

| | Sample Name | Sample Date | Sample Time | Sample Type (Matrix)* | VOC (EPA 8260) | GX/BTEX | BTEX | Gasoline Range Organics (GX) | Hydrocarbon Identification (HCID) | Diesel/Heavy Oil Range Organics (DX) | SEMI VOL (EPA 8270) | PAH (EPA 8270 - SIM) | PCBs (EPA 8082) | Metals** (6020 / 200.8) | Total (T) \| Dissolved (D) | Anions (IC)*** | EDB (8011) | Comments/Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DRUM-WATER | 2-19-14 | 900 | W | X | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | |

**Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Special Remarks:

| Relinquished | Date/Time | Received | Date/Time |
|---|---|---|---|
| x | 2-19-14/1045 | x | 2/19/14 10:45 |
| Relinquished | Date/Time | Received | Date/Time |
| x | | x | |

TAT -> SameDay^ NextDay^ 2 Day 3 Day (STD)

^Please coordinate with the lab in advance

Distribution: White - Lab, Yellow - File, Pink - Originator

www.fremontanalytical.com

# This Shipping Order

must be legibly filled in, in Ink indelible Pencil, or in Carbon, and retained by the agent

Shipper No. 013000

Carrier No. _____

MARINE VACUUM SERVICE INC.

(Name of carrier) (SCAC)

Page _____ of _____

Date 3/14/14

On Collect on Delivery shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec.1.

**TO:**
Consignee MARINE VACUUM SERVICE INC.

Street 1516 S. GRAHAM ST.

City SEATTLE State WA Zip Code 98108

**FROM:**
Shipper PES Environmental

Street 17617 1st Ave S.

City Normandy Park State Zip Code

24 hr. Emergency Contact Tel. No. 800-540-7491

Route

Vehicle Number

| No. of Units & Container Type | HM | BASIC DESCRIPTION UN or NA Number, Proper Shipping Name, Hazard Class, Packing Group | TOTAL QUANTITY (Weight, Volume, Gallons, etc.) | WEIGHT (Subject to Correction) | RATE | CHARGES (For Carrier Use Only) |
|---|---|---|---|---|---|---|
| 10 Drums | | Waste Water | 550 gal | | | |
| | | | | | | |
| | | | | | | |
| | | |

**PES Environmental, Inc.**
**Engineering & Environmental Services**

May 14, 2014

**1358.001.01**

Ms. Courtney Seim
Riddell Williams, P.S.
1001 Fourth Avenue, Suite 4500
Seattle, Washington 98154

Mr. Bob DiJulio
Wolfstone Panchot & Block, P.S.
1111 Third Avenue, Suite 1800
Seattle, Washington 98101

**GROUNDWATER MONITORING – APRIL 2014**
**MANHATTAN VILLAGE SHOPPING CENTER AND HARRIS PROPERTIES**
**NORMANDY PARK, WASHINGTON**

Dear Ms. Seim and Mr. DiJulio:

PES Environmental, Inc. (PES) has prepared this letter to summarize the recent groundwater monitoring and sampling event for the Manhattan Village Shopping Center (MVSC) property located at 17835 First Avenue South (the "MVSC property") and the Harris property located at 17817 – 17825 First Avenue South in Normandy Park, Washington (the "Harris property"), collectively referred to as the "Property." The location and current features of the Property are shown on Figures 1 and 2. This work was conducted in accordance with PES's *Request for Change Order No. 2*, dated September 26, 2013. The scope of the groundwater monitoring event included:

1) Evaluating and sampling groundwater monitoring well DC-15. This well is in a key sentinel well location upgradient of the Harris northern property line. An obstruction within the well casing prevented this well from being sampled during the May 2013 monitoring event; and

2) Sampling groundwater monitoring wells MW-2, MW-15, DC-11, DC-12, DC-13, DC-20, and KMW-9 to evaluate the effects on tetrachloroethene (PCE) concentrations in groundwater after temporarily shutting down nearby soil vapor extraction (SVE) system wells SVE-5 through SVE-10 (note - SVE wells SVE-1 through SVE-4 have remained operational). The groundwater PCE concentrations were below Ecology's Model Toxics Control Act (MTCA) Method A cleanup level (CUL) of 5 micrograms per liter (µg/L) during the April 2012 and/or the May 2013 groundwater monitoring events. The SVE wells were shutdown on February 19, 2014, and the monitoring wells were sampled approximately two months later on April 14 and 15, 2014. The purpose of the evaluation is to determine whether air

sparging (AS) and/or continued SVE is required to cleanup groundwater in the vicinity of these monitoring wells on the eastern half of the Harris property.

## DC-15 EVALUATION

PES was unable to sample 2-inch diameter monitoring well DC-15 during the May 2013 sampling event due to an apparent obstruction within the monitoring well casing. The obstruction was observed at a depth of approximately 12 feet (well above the water table) and was assumed to be a broken or bent well casing because the obstruction allowed passage of a 0.5-inch diameter water level indicator probe but did not allow passage of 1.75-inch diameter submersible groundwater sampling pump. In April 2014, PES lowered a small stainless steel bailer beyond the obstruction in an attempt to determine the diameter of sampling pump which might be able to clear the obstruction without becoming permanently lodged in the well. However, upon retrieving the bailer, PES also retrieved a "ball" of polyethylene tubing which apparently had been left in the well following a prior sampling event by the previous consultant. Once the tubing was removed, the well was no longer obstructed and could be sampled without using special equipment.

## GROUNDWATER MONITORING AND SAMPLING

### Groundwater Level Monitoring

Groundwater level monitoring was conducted on April 14, 2014, in monitoring wells MW-2, MW-15, DC-11, DC-12, DC-13, DC-15, DC-20, and KMW-9. Depth to water was measured from the surveyed top of casing (TOC) to the nearest 0.01 foot using an electronic water level probe.

### Groundwater Sampling

Groundwater samples were collected on April 14 and 15, 2014, using low-flow sampling techniques from wells MW-2, MW-15, DC-11, DC-12, DC-13, DC-15, DC-20, and KMW-9. A decontaminated Grundfos pump with new tubing was lowered into each well, and the groundwater was purged prior to sample collection until parameters stabilized. Field parameters measured during sampling consisted of temperature, pH, specific conductance, dissolved oxygen (DO), and oxidation reduction potential (ORP). The pump intake was set at approximately 2.0 to 3.8 feet below the static water level, generally consistent with previous sampling events.

Samples were collected into preserved 40-ml VOA sampling containers and submitted to ESC Lab Sciences (ESC) in Mt. Juliet, TN (a Washington Department of Ecology [Ecology] accredited laboratory) for analysis of Volatile Organic Compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260B.

### Quality Assurance/Quality Control

Equipment blank samples (EQ-1 and EQ-2) were collected at the end of each sampling day following decontamination of the Grundfos pump. The equipment blank samples were collected by pumping de-ionized water through the Grundfos pump and new tubing and into laboratory

prepared sample containers. One set of trip blanks was included in the coolers and was returned to the ESC with the second cooler shipment for VOC analysis.

## RESULTS

### Groundwater Monitoring

Water level measurements and groundwater elevations are summarized in Table 1, and field parameter measurements are summarized in Table 2 from the April 2014 sampling event. The depth to water measurements are from the TOC. Groundwater elevations on both properties ranged from 271.87 to 272.62 feet above North American Vertical Datum of 1988 (NAVD 88), and were consistent with historical observations. The groundwater elevations are shown on Figure 2.

### Groundwater Analytical Results

The laboratory analytical results from the April 2014 sampling event for PCE are summarized in Table 3 and on Figure 2. For purposes of comparison, the prior results from May 2013 (or April 2012 if not sampled in 2013) are also included on Table 3 and Figure 2, and a complete summary of historical PCE concentrations in groundwater monitoring wells is included in Attachment A. The results from the April 2014 sampling event are summarized as follows:

3) PCE was not detected at or above the method reporting limit of 1.0 µg/L in shallow monitoring well MW-15 for the third consecutive sampling event;

4) PCE was detected in shallow monitoring wells MW-2, DC-11, DC-12, DC-13, DC-20 and KMW-9 at concentrations below the Method A CUL (5 µg/L). Wells DC-11 and KMW-9 have been below the CUL since 2010, DC-12 has been below the CUL since 2012, and MW-2 and DC-20 have been below the CUL since 2013;

5) PCE was detected above the cleanup level in shallow monitoring well DC-15, with a concentration of 10 µg/L and just below the range of historical sampling events in April 2007 (11 µg/L) and April 2012 (20 µg/L); and

6) PCE was not detected at or above the method reporting limits in any of the equipment blank and trip blank samples.

### Laboratory Data Validation

The laboratory analytical reports were validated in accordance with the USEPA guidelines for organic data review[1]. All of the data were judged to be acceptable for their intended use. Copies of the laboratory analytical reports and data validation memoranda are included in Attachment B.

[1] *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*. OSWER 9240.1-05A-P PB99-963506 EPA540/R-99/008, October.

## CONCLUSIONS AND RECOMMENDATIONS

Monitoring well DC-15, located approximately 90 feet south of the Harris property line, has been sampled only three times (2007, 2012, and 2014) and the results ranged from 10 to 20 µg/L. The April 2014 PCE result in DC-15 (10 µg/L) was approximately the same as the May 2013 result in downgradient monitoring well DC-8 (11 µg/L).

SVE wells SVE-5 through SVE-10 were shut down approximately two months prior to the April 2014 groundwater sampling event. The April 2014 PCE concentrations were similar to the May 2013 PCE concentrations for the wells sampled during both events. Potential rebound effect from shutting down the SVE system has not been noted at this time, and so PES recommends that SVE-5 through SVE-10 continue to remain offline.

PES also recommends conducting a full round of groundwater monitoring and sampling in 2014 prior to startup of the proposed AS system and expanded SVE system. The sampling would serve as a baseline prior to full scale AS/SVE operation, and would allow continued evaluation of potential for PCE rebound in groundwater monitoring wells MW-2, MW-15, DC-11, DC-12, DC-13, DC-20, and KMW-9.

PES appreciates the opportunity to conduct these groundwater monitoring activities. If you have any questions regarding this report, or need any additional information, please feel free to contact either of us at (206) 529-3980.

Sincerely,

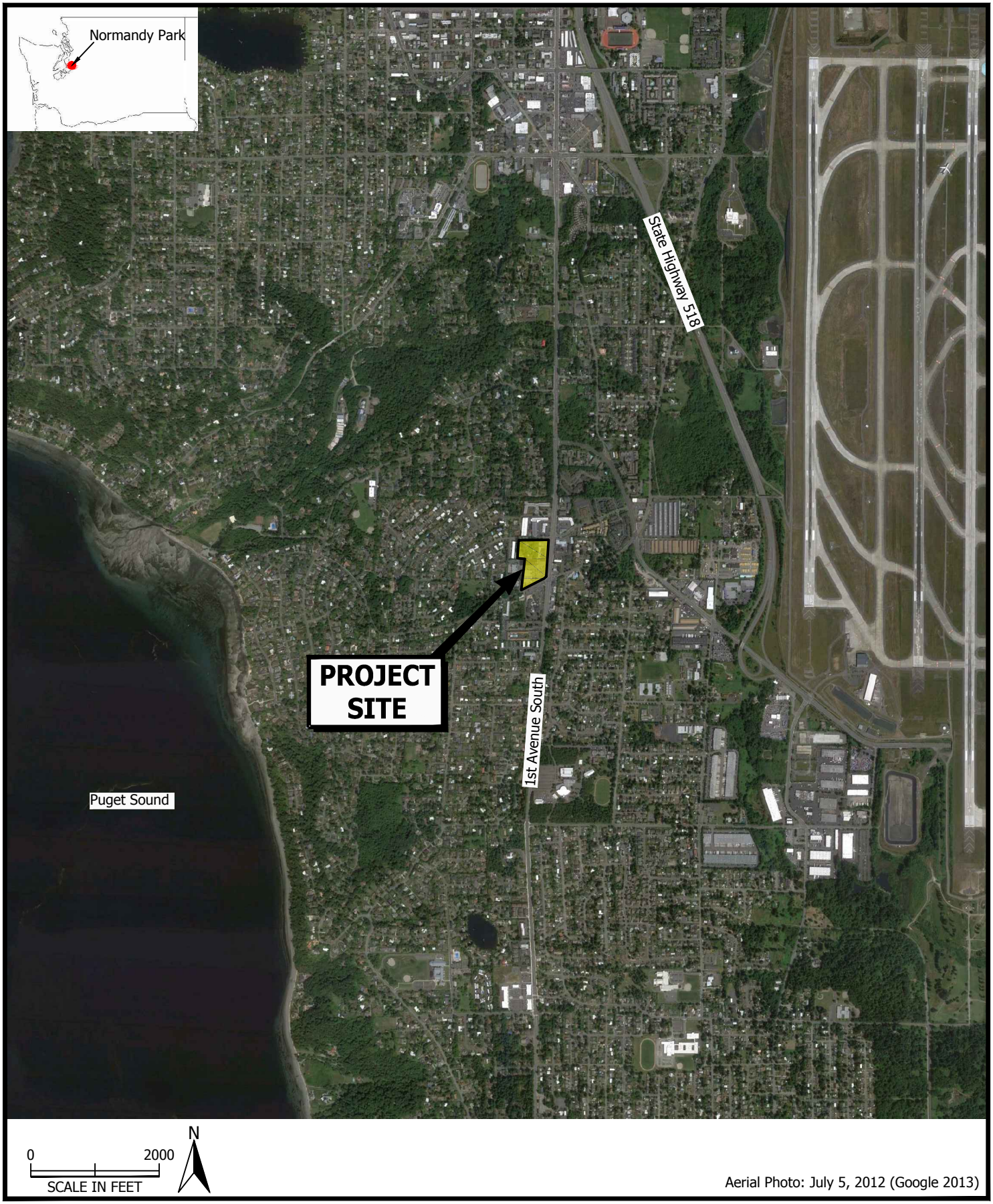
**PES ENVIRONMENTAL, INC.**

Kelly L. Rankich
Project Engineer

Matthew V. Dahl, P.E.
Senior Engineer

Attachments:

Figure 1– Site Location Map
Figure 2 – Groundwater Elevations and PCE Concentrations –April 2014
Table 1 – Summary of Groundwater Elevations
Table 2 – Summary of Groundwater Field Parameters
Table 3 – Summary of Groundwater Analytical Results
Attachment A – Historical Summary of Groundwater Analytical Results
Attachment B – Laboratory Report and Data Validation Memorandum




Aerial Photo: July 5, 2012 (Google 2013)

**PES Environmental, Inc.**
Engineering & Environmental Services

**Site Location Map**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

FIGURE
1

| 1358.001.01.003 | 1358-00101003_2014_Q2_1 | MVD | 7/14 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |

DAY CARE
PARKING LOT
CONDOMINIUMS
CONDOMINIUMS
SUSPECTED SEPTIC TANK
SECOND BUILDING (VARIOUS SHOPS)
QFC BUILDING
FOUR STAR DRY CLEANERS
MANHATTAN VILLAGE SHOPPING CENTER
RETAINING WALL
EXISTING TREATMENT SYSTEM
WELL HOUSE
RESIDENCE
RESIDENCE
VACANT SHED
HARRIS PROPERTY
FORMER SEPTIC TANK
FORMER DAIRY QUEEN
FORMER LAUNDROMAT/ DRY CLEANER
COMMERCIAL BUILDING
SW 178th STREET

MW-13 MW-4 MW-12 MW-3 MW-10 MW-14 MW-11 MW-16 MW-15 (272.47) MW-2 (272.39) MW-1
KMW-3 KMW-2 KMW-7 KMW-9 (272.62) KMW-8 KMW-1
DC-10A DC-10B DC-5 DC-17 (272.51) DC-7 DC-4 DC-9A DC-9B DC-16 DC-8 DC-15 (271.87) DC-18 DC-13 (272.18) DC-14 DC-11 (272.52) DC-19 DC-12 (272.32) DC-20 (272.06) DC-3 DC-2 DC-1
AS-1
SVE-11A SVE-11B SVE-12A SVE-12B SVE-13A SVE-13B SVE-1 SVE-2 SVE-3 SVE-4 SVE-5 SVE-6 SVE-7 SVE-8 SVE-9 SVE-10
VMP-1 VMP-2 VMP-3 VMP-4 VMP-5 VMP-6
TW-1

| MW-15 | |
|---|---|
| Date | PCE |
| 05/28/13 | <1.0 |
| 04/14/14 | <1.0 |

| MW-2 | |
|---|---|
| Date | PCE |
| 05/30/13 | 2.4 |
| 04/14/14 | 3.2 |

| DC-15 | |
|---|---|
| Date | PCE |
| 04/05/12 | **20** |
| 04/15/14 | **10** |

| KMW-9 | |
|---|---|
| Date | PCE |
| 04/05/12 | 4.0 |
| 04/15/14 | 1.0 |

| DC-13 | |
|---|---|
| Date | PCE |
| 05/30/13 | 1.7 |
| 04/14/14 | 3.2 |

| DC-11 | |
|---|---|
| Date | PCE |
| 04/05/12 | 3.1 |
| 04/15/14 | 1.2 |

| DC-12 | |
|---|---|
| Date | PCE |
| 05/30/13 | 2.3 |
| 04/15/14 | 1.4 |

| DC-20 | |
|---|---|
| Date | PCE |
| 05/30/13 | 1.7 |
| 04/14/14 | 1.4 |

EXPLANATION

- Approximate Property Boundary
- MW-12 Shallow Monitoring Well
- DC-16 Deep Monitoring Well
- DC-6 Missing or Destroyed Monitoring Well
- DC-9B Abandoned Monitoring Well
- AS-1 Air Sparge Well
- SVE-1 Soil Vapor Extraction Well
- (272.47) Groundwater-Level Elevation in feet NAVD 88 on April 14, 2014
- **10** Tetrachloroethene (PCE) concentration in micrograms per liter (ug/L); results in red exceed the MTCA Method A cleanup leve
- <1.0 PCE not detected at or above the indicated method reporting limit (MRL)

NOTES:

1. SVE wells SVE-5 through SVE-10 shutdown on February 19, 2014
2. PCE results from the previous groundwater sampling event are included for comparison purposes

N

0 50

SCALE IN FEET

**PES Environmental, Inc.**
Engineering & Environmental Services

**Groundwater Elevations and PCE Concentrations April 2014**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

FIGURE 2

| 1358.001.01.003 | 1358-00101003_2014_Q2_2 | MVD | 7/14 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |

# Table 1
## Summary of Groundwater Elevations
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Elevation (feet NAVD 88) | | | Screened Interval (feet) | | Date | Depth to Water (feet TOC) | Groundwater Elevation (feet NAVD 88) |
|---|---|---|---|---|---|---|---|---|
| | Top of Casing (TOC) | Surface Casing Rim | Ground Surface | Below Ground Surface (bgs) | Below Top of Casing | | | |
| MW-2 | 308.56 | 309.26 | -- | 33-43 | -- | 4/14/2014 | 36.17 | 272.39 |
| MW-15 | 312.44 | 312.81 | 310.30 | 35-45 | 37.1-47.1 | 4/14/2014 | 39.97 | 272.47 |
| DC-11 | 311.25 | 311.66 | -- | 32.-42 | -- | 4/14/2014 | 38.73 | 272.52 |
| DC-12 | 311.25 | 311.58 | -- | 32-42 | -- | 4/14/2014 | 38.93 | 272.32 |
| DC-13 | 310.20 | 310.52 | -- | 32-42 | -- | 4/14/2014 | 38.02 | 272.18 |
| DC-15 | 307.89 | 308.20 | -- | 31-41 | -- | 4/14/2014 | 36.02 | 271.87 |
| DC-20 | 310.92 | 311.13 | -- | 34-44 | -- | 4/14/2014 | 38.86 | 272.06 |
| KMW-9 | 310.53 | 310.94 | -- | 34-44 | -- | 4/14/2014 | 37.91 | 272.62 |

NOTES:

1. '-- = not measured or not applicable.
2. Elevations are reported relative to North American Vertical Datum of 1988 (NAVD 88).
3. Top of casing (TOC) elevations were surveyed by D.R. Strong Consulting Engineers, Inc. in February and May 2013.
4. Screened intervals are documented on boring logs and are typically based on a field measurements relative to ground surface at the time of drilling. Screened intervals relative to top of casing are estimated using field well construction measurements, and surveyed ground surface and top of casing elevations.

# Table 2
## Summary of Groundwater Field Parameters
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | Depth to Water (feet TOC) | pH (units) | Specific Conductivity (µS/cm) | Temp (°C) | DO (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|---|
| MW-2 | 4/14/2014 | 36.17 | 6.33 | 203 | 15.8 | 6.2 | 126 |
| MW-15 | 4/14/2014 | 39.97 | 6.63 | 235 | 16.0 | 6.7 | 112 |
| DC-11 | 4/14/2014 | 38.70 | 6.43 | 150 | 15.8 | 2.7 | 184 |
| DC-12 | 4/15/2014 | 38.90 | 6.87 | 150 | 16.2 | 2.8 | 184 |
| DC-13 | 4/14/2014 | 38.03 | 6.21 | 123 | 17.3 | 7.5 | 150 |
| DC-15 | 4/15/2014 | 36.01 | 6.09 | 136 | 14.1 | 3.7 | 183 |
| DC-20 | 4/14/2014 | 38.65 | 6.17 | 156 | 17.4 | 2.2 | 133 |
| KMW-9 | 4/15/2014 | 37.89 | 6.30 | 211 | 15.1 | 2.8 | 168 |

NOTES:

1. TOC = top of casing.
2. units: pH standard units reported to 0.01.
3. µS/cm = microsiemens per centimeter @ 25 degrees Celsius (°C).
4. Dissolved Oxygen (DO) reported to 0.1 milligrams per liter (mg/L).
5. ORP = oxidation-reduction potential.
6. mV = millivolts.

# Table 3
## Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Screened Interval (feet) Below Ground Surface (bgs) | Screened Interval (feet) Below Top of Casing (TOC) | Pump Intake Depth (feet TOC) | Date | Depth to Water (feet TOC) | PCE (µg/l) | |
|---|---|---|---|---|---|---|---|
| **MTCA Method A Ground Water Cleanup Level** | | | | | | **5** | |
| MW-2 | 33-43 | -- | 38 | 5/30/2013 | 35.71 | **2.4** | |
| | | | 40 | 4/14/2014 | 36.17 | **3.2** | |
| MW-15 | 35-45 | 37.1-47.1 | 42 | 5/28/2013 | 39.55 | 1.0 | U |
| | | | 42 | 4/14/2014 | 39.97 | 1.0 | U |
| DC-11 | 32-42 | -- | 40 | 4/4/2012 | 38.67 | **3.1** | |
| | | | 41 | 4/15/2014 | 38.70 | **1.2** | |
| DC-12 | 32-42 | -- | 40 | 5/30/2013 | 38.50 | **2.3** | |
| | | | 41 | 4/15/2014 | 38.90 | **1.4** | |
| DC-13 | 32-42 | -- | 39 | 5/30/2013 | 37.60 | **1.7** | |
| | | | 41 | 4/14/2014 | 38.03 | **3.2** | |
| DC-15 | 31-41 | -- | 37 | 4/5/2012 | 35.94 | **20** | |
| | | -- | 39 | 4/15/2014 | 36.01 | **10** | |
| DC-20 | 34-44 | -- | 40 | 5/30/2013 | 38.40 | **1.7** | |
| | | | 42 | 4/14/2014 | 38.65 | **1.4** | |
| KMW-9 | 34-44 | -- | 40 | 4/5/2012 | 37.84 | **4.0** | |
| | | -- | 41 | 4/15/2014 | 37.89 | **1.0** | |

NOTES:

1. Tetrachloroethene (PCE) concentrations in migrograms per liter (µg/l).
2. Groundwater samples analyzed using USEPA Method 8260B.
3. U = concentration not detected at or above the laboratory practical quantitation limit (PQL).
4. Detected concentrations are shown in **bold.**
5. Concentrations exceeding the cleanup level are **bold and shaded**.
6. Screened interval depths are measured in feet below ground surface (bgs) and estimated in feet below top of casing (TOC).
7. Pump intake depth and depth to water is measured in feet below the top of casing (TOC).
8. Results of the previous groundwater sampling event is included for comparison purposes.

# ATTACHMENT A
# HISTORICAL SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

# Table A-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| **Shallow Monitoring Wells** | | | |
| MW-01 | 12/10/1999 | **22** | |
| | 4/11/2006 | **14** | |
| | 10/26/2006 | **11** | |
| | 4/25/2007 | **13** | |
| MW-02 | 12/10/1999 | **17** | |
| | 4/5/2012 | **7.1** | |
| | 5/30/2013 | **2.4** | |
| | 4/14/2014 | **3.2** | |
| MW-03 | 4/14/2008 | **2.3** | |
| | 11/1/2010 | **2.9** | |
| | 5/31/2011 | 2.0 | U |
| | 7/20/2011 | 2.0 | U |
| | 10/18/2011 | **6.1** | |
| | 4/4/2012 | **5.8** | |
| | 5/29/2013 | **4.0** | |
| MW-04 | 4/14/2008 | **33** | |
| | 3/9/2010 | **7.8** | |
| | 11/1/2010 | **16** | |
| | 5/31/2011 | **10** | |
| | 7/21/2011 | **25** | |
| | 10/19/2011 | **21** | |
| | 4/4/2012 | **11** | |
| | 5/29/2013 | **8.1** | |
| MW-05 | 4/11/2008 | **0.50** | |
| | 4/2/2012 | 2.0 | U |
| MW-06 | 4/15/2008 | 2.0 | U |
| | 4/2/2012 | 2.0 | U |
| MW-07 | 4/16/2008 | **22** | |
| | 4/2/2012 | **14** | |
| MW-08 | 8/21/2008 | **0.20** | J |
| | 4/2/2012 | 2.0 | U |
| MW-09 | 8/21/2008 | **0.10** | J |
| | 4/2/2012 | 2.0 | U |
| MW-10 | 2/8/2011 | **10** | |
| | 5/31/2011 | 2.0 | U |
| | 7/20/2011 | **4.1** | |
| | 10/18/2011 | **4.9** | |
| | 4/6/2012 | **6.7** | |
| | 5/29/2013 | **4.1** | |

# Table A-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| MW-11 | 2/8/2011 | **47** | |
| | 5/31/2011 | 2.0 | U |
| | 7/20/2011 | 2.0 | U |
| | 10/18/2011 | 2.0 | U |
| | 4/6/2012 | **29** | |
| | 5/31/2013 | **22** | |
| MW-12 | 4/4/2012 | 2.0 | U |
| | 5/28/2013 | 1.0 | U |
| MW-13 | 4/3/2012 | 2.0 | U |
| | 5/30/2013 | 1.0 | U |
| MW-14 | 4/5/2012 | 2.0 | U |
| | 5/29/2013 | 1.0 | U |
| MW-15 | 4/5/2012 | 2.0 | U |
| | 5/28/2013 | 1.0 | U |
| | 4/14/2014 | 1.0 | U |
| MW-16 | 5/31/2013 | 1.0 | U |
| DC-01 | 10/21/1998 | **0.60** | |
| | 2/3/1999 | 0.5 | U |
| | 4/7/1999 | 0.5 | U |
| | 12/8/1999 | 1.0 | U |
| | 4/26/2000 | 1.0 | U |
| | 8/3/2000 | 1.0 | U |
| | 11/14/2000 | 1.0 | U |
| | 3/6/2001 | 1.0 | U |
| | 6/20/2001 | 1.0 | U |
| | 9/17/2001 | 1.0 | U |
| | 12/20/2001 | 1.0 | U |
| | 3/13/2002 | 1.0 | U |
| | 9/17/2002 | 1.0 | U |
| | 12/10/2002 | 1.0 | U |
| | 3/31/2003 | 1.0 | U |
| | 9/3/2003 | 1.0 | U |
| | 3/16/2004 | 1.0 | U |
| | 9/7/2004 | 1.0 | U |
| | 4/25/2007 | 0.2 | U |
| | 4/4/2012 | 2.0 | U |

# Table A-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| DC-02 | 10/21/1998 | **2.4** | |
| | 2/3/1999 | **0.70** | |
| | 4/7/1999 | 0.5 | U |
| | 12/8/1999 | 0.5 | U |
| | 4/26/2000 | 1.0 | U |
| | 8/3/2000 | 1.0 | U |
| | 11/14/2000 | 1.0 | U |
| | 3/6/2001 | 1.0 | U |
| | 6/20/2001 | 1.0 | U |
| | 9/17/2001 | 1.0 | U |
| | 12/20/2001 | 1.0 | U |
| | 3/13/2002 | **4.0** | |
| | 6/13/2002 | 1.0 | U |
| | 9/17/2002 | 1.0 | U |
| | 12/10/2002 | **0.50** | |
| | 3/31/2003 | **3.4** | |
| | 9/3/2003 | 1.0 | U |
| | 3/16/2004 | **0.74** | |
| | 9/7/2004 | 1.0 | U |
| | 4/26/2007 | **1.2** | |
| | 4/14/2008 | **0.30** | |
| | 11/3/2010 | 2.0 | U |
| | 5/31/2011 | 2.0 | U |
| | 7/21/2011 | 2.0 | U |
| | 10/18/2011 | 2.0 | U |
| | 4/4/2012 | 2.0 | U |
| DC-03 | 10/28/1998 | **54** | |
| | 2/4/1999 | **25** | |
| | 4/8/1999 | **36** | |
| | 12/8/1999 | **45** | |
| | 4/26/2000 | **56** | |
| | 8/3/2000 | **25** | |
| | 11/14/2000 | 1.0 | U |
| | 3/6/2001 | **4.7** | |
| | 6/20/2001 | **2.8** | |
| | 9/17/2001 | 1.0 | U |
| | 12/20/2001 | **9.2** | |
| | 3/13/2002 | **40** | |
| | 6/13/2002 | **42** | |
| | 9/17/2002 | **33** | |
| | 12/10/2002 | **5.4** | |
| | 3/31/2003 | **7.3** | |
| | 9/3/2003 | **2.1** | |
| | 3/16/2004 | 1.0 | U |
| | 9/7/2004 | **3.4** | |
| | 4/26/2007 | **42** | |
| | 4/14/2008 | **28** | |

# Table A-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| DC-03 continued | 3/9/2010 | 2.0 | U |
| | 11/3/2010 | 2.0 | U |
| | 5/30/2011 | **3.9** | |
| | 7/20/2011 | **12** | |
| | 10/18/2011 | **6.7** | |
| | 4/4/2012 | **2.9** | |
| DC-04 | 10/28/1998 | **227** | |
| | 2/4/1999 | **144** | |
| | 4/8/1999 | **110** | |
| | 12/8/1999 | **71** | |
| | 4/26/2000 | **120** | |
| | 8/3/2000 | **42** | |
| | 11/14/2000 | **64** | |
| | 3/6/2001 | **52** | |
| | 6/20/2001 | **40** | |
| | 9/17/2001 | **23** | |
| | 12/20/2001 | **15** | |
| | 3/13/2002 | **55** | |
| | 6/13/2002 | **18** | |
| | 9/17/2002 | **29** | |
| | 12/10/2002 | **22** | |
| | 3/31/2003 | **13** | |
| | 9/3/2003 | **14** | |
| | 3/16/2004 | **20** | |
| | 9/7/2004 | **19** | |
| | 4/26/2007 | **19** | |
| | 4/11/2008 | **30** | |
| | 3/9/2010 | **9.2** | |
| | 11/3/2010 | **13** | |
| | 5/31/2011 | 2.0 | U |
| | 7/20/2011 | 2.0 | U |
| | 10/18/2011 | **22** | |
| | 4/4/2012 | **22** | |
| | 5/30/2013 | **11** | |
| DC-06 | 2/4/1999 | **5.1** | |
| | 4/8/1999 | **3.7** | |

# Table A-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) |
|---|---|---|
| DC-07 | 2/4/1999 | **74** |
| | 4/8/1999 | **64** |
| | 12/8/1999 | **107** |
| | 4/26/2000 | **130** |
| | 8/3/2000 | **50** |
| | 11/14/2000 | **130** |
| | 3/6/2001 | **140** |
| | 6/20/2001 | **96** |
| | 9/17/2001 | **81** |
| | 12/20/2001 | **47** |
| | 3/13/2002 | **31** |
| | 6/13/2002 | **42** |
| | 9/17/2002 | **78** |
| | 12/10/2002 | **92** |
| | 3/31/2003 | **40** |
| | 9/3/2003 | **57** |
| | 4/11/2006 | **23** |
| | 10/26/2006 | **51** |
| | 4/24/2007 | **27** |
| | 4/16/2010 | **51** |
| | 11/3/2010 | **34** |
| | 6/1/2011 | **15** |
| | 7/21/2011 | **38** |
| | 10/18/2011 | **42** |
| | 4/5/2012 | **18** |
| | 5/30/2013 | **15** |
| DC-08 | 2/4/1999 | **56** |
| | 4/8/1999 | **48** |
| | 12/8/1999 | **98** |
| | 4/26/2000 | **87** |
| | 8/3/2000 | **70** |
| | 11/14/2000 | **130** |
| | 3/6/2001 | **82** |
| | 6/20/2001 | **80** |
| | 9/17/2001 | **62** |
| | 12/20/2001 | **50** |
| | 3/13/2002 | **31** |
| | 6/13/2002 | **27** |
| | 9/17/2002 | **38** |
| | 12/10/2002 | **53** |
| | 3/31/2003 | **36** |
| | 9/3/2003 | **35** |
| | 4/11/2006 | **14** |
| | 10/26/2006 | **28** |
| | 4/24/2007 | **24** |
| | 4/16/2010 | **39** |
| | 11/3/2010 | **25** |

# Table A-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| DC-08 continued | 6/1/2011 | **11** | |
| | 7/21/2011 | **25** | |
| | 10/19/2011 | **26** | |
| | 4/5/2012 | **18** | |
| | 5/30/2013 | **11** | |
| DC-09A | 4/8/1999 | **135** | |
| | 12/8/1999 | **73** | |
| | 4/26/2000 | **240** | |
| | 8/3/2000 | **110** | |
| | 4/11/2006 | **78** | |
| | 8/8/2006 | **49** | |
| | 11/2/2006 | 2.9 | |
| | 4/26/2007 | **33** | |
| DC-10A | 4/8/1999 | **150** | |
| | 12/8/1999 | **73** | |
| | 4/26/2000 | **210** | |
| | 4/5/2012 | **41** | |
| | 5/31/2013 | **19** | |
| DC-11 | 4/26/2007 | **12** | |
| | 3/9/2010 | **4.6** | |
| | 11/1/2010 | **4.8** | |
| | 4/4/2012 | **3.1** | |
| | 4/15/2014 | **1.2** | |
| DC -12 | 4/25/2007 | **16** | |
| | 4/4/2012 | **3.7** | |
| | 5/30/2013 | **2.3** | |
| | 4/15/2014 | **1.4** | |
| DC-13 | 4/25/2007 | **15** | |
| | 4/16/2008 | **23** | |
| | 3/1/2010 | **10** | |
| | 11/2/2010 | **9.2** | |
| | 4/5/2012 | **6.4** | |
| | 5/30/2013 | **1.7** | |
| | 4/14/2014 | **3.2** | |
| DC-14 | 4/25/2007 | **11** | |
| | 4/3/2012 | **11** | |
| | 5/30/2013 | **6.0** | |
| DC-15 | 4/24/2007 | **11** | |
| | 4/5/2012 | **20** | |
| | 4/15/2014 | **10** | |
| DC-16 | 4/25/2007 | **0.42** | |
| | 11/5/2010 | 2.0 | U |
| | 5/31/2011 | 2.0 | U |
| | 7/19/2011 | 2.0 | U |
| | 10/18/2011 | 2.0 | U |
| | 4/6/2012 | 2.0 | U |

# Table A-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| DC-17 | 4/25/2007 | **47** | |
| | 4/16/2008 | **75** | |
| | 5/31/2013 | **21** | |
| DC-18 | 4/25/2007 | **19** | |
| | 4/5/2012 | **7.2** | |
| | 5/30/2013 | **4.8** | |
| DC-19 | 6/4/2007 | **0.79** | |
| | 4/14/2008 | **0.70** | |
| | 4/4/2012 | 2.0 | U |
| DC-20 | 5/30/2013 | **1.7** | |
| | 4/14/2014 | **1.4** | |
| KMW-01 | 4/11/2006 | 1.0 | U |
| | 10/26/2006 | 1.0 | U |
| | 4/25/2007 | 0.2 | U |
| | 4/14/2008 | 0.2 | U |
| | 4/3/2012 | 2.0 | U |
| KMW-02 | 6/12/2006 | **130** | |
| | 8/8/2006 | **130** | |
| | 10/26/2006 | **190** | |
| | 4/24/2007 | **63** | |
| | 4/16/2008 | **96** | |
| | 3/8/2010 | **81** | |
| | 11/3/2010 | **74** | |
| | 6/1/2011 | **12** | |
| | 7/20/2011 | **44** | |
| | 10/19/2011 | **40** | |
| | 4/6/2012 | **25** | |
| | 5/31/2013 | **22** | |
| KMW-03 | 6/12/2006 | **20** | |
| | 10/26/2006 | **13** | |
| | 4/24/2007 | **9.9** | |
| | 11/2/2010 | **11** | |
| | 5/31/2011 | **6.2** | |
| | 7/20/2011 | **12** | |
| | 10/18/2011 | **11** | |
| | 4/3/2012 | **6.8** | |
| KMW-04 | 4/25/2007 | **0.73** | |
| | 4/3/2012 | 2.0 | U |
| KMW-05 | 4/25/2007 | **0.82** | |
| | 4/3/2012 | 2.0 | U |
| KMW-06 | 4/24/2007 | **3.8** | |
| | 4/3/2012 | 2.0 | U |

# Table A-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| KMW-07 | 4/24/2007 | **3.8** | |
| | 4/15/2008 | **3.9** | |
| | 11/3/2010 | 2.0 | U |
| | 5/30/2011 | **2.3** | |
| | 7/20/2011 | 2.0 | U |
| | 10/18/2011 | 2.0 | U |
| | 4/3/2012 | **3.3** | |
| KMW-08 | 4/24/2007 | **11** | |
| | 4/15/2008 | **17** | |
| | 4/3/2012 | **10** | |
| KMW-09 | 4/26/2007 | **9.3** | |
| | 3/8/2010 | **4.4** | |
| | 11/4/2010 | **2.8** | |
| | 4/5/2012 | **4.0** | |
| | 4/15/2014 | **1.0** | |
| **Deep Monitoring Wells** | | | |
| DC-05 | 2/4/1999 | **2.4** | |
| | 4/8/1999 | **1.6** | |
| | 4/11/2006 | **1.3** | |
| | 4/26/2007 | **2.1** | |
| | 11/3/2010 | **2.1** | |
| | 5/30/2011 | 2.0 | U |
| | 7/19/2011 | 2.0 | U |
| | 10/18/2011 | 2.0 | U |
| | 4/6/2012 | 2.0 | U |
| | 5/29/2013 | 1.0 | U |
| DC-09B | 4/8/1999 | **1.4** | |
| | 3/6/2001 | **2.0** | |
| | 6/20/2001 | 1.0 | U |
| | 9/17/2001 | 1.0 | U |
| | 12/20/2001 | **6.4** | |
| | 4/11/2006 | 1.0 | U |
| | 8/8/2006 | 1.0 | U |
| | 10/26/2006 | 1.0 | U |
| | 4/26/2007 | 0.2 | U |
| | 4/15/2008 | **0.60** | |

# Table A-1
## Historical Summary of Groundwater Analytical Results
## Manhattan Village Shopping Center and Harris Properties
## Normandy Park, Washington

| Monitoring Well | Date | PCE (µg/l) | |
|---|---|---|---|
| DC-10B | 4/8/1999 | **1.8** | |
| | 3/6/2001 | **3.3** | |
| | 6/20/2001 | **2.4** | |
| | 9/17/2001 | 1.0 | U |
| | 12/20/2001 | 1.0 | U |
| | 4/11/2006 | 1.0 | U |
| | 4/26/2007 | **0.34** | |
| | 11/3/2010 | **2.6** | |
| | 5/30/2011 | 2.0 | U |
| | 7/19/2011 | 2.0 | U |
| | 10/18/2011 | 2.0 | U |
| | 4/6/2012 | 2.0 | U |
| KMW-05D | 4/25/2007 | 0.2 | U |
| | 4/3/2012 | 2.0 | U |

NOTES:

1. Tetrachloroethene (PCE) concentrations in migrograms per liter (µg/l).
2. Groundwater samples analyzed using USEPA Method 8260B.
3. U = concentration not detected at or above the laboratory practical quantitation limit (PQL).
4. Detected concentrations are shown in **bold.**
5. Concentrations exceeding the cleanup level are **bold and shaded**.
6. Shallow monitoring wells are screened at the top of the shallow aquifer, and deep monitoring wells are screened below and deeper within the shallow aquifer.
7. Review of historical results indicate that DC-17 was inadvertently sampled as DC-5 in 2010, 2011 and 2012. This table reports the 2010 - 2012 DC-17 data as DC-5.

# ATTACHMENT B
# LABORATORY REPORT AND DATA VALIDATION MEMORANDUM

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Est. 1970

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

# Report Summary

Thursday April 24, 2014

Report Number: L694055
Samples Received: 04/16/14
Client Project: MVSC

Description: Manhattan Village

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: Jarred Willis

Jarred Willis , ESC Representative

*Laboratory Certification Numbers*

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-01

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : MW-15-041414

Collected By : Karsten Springstead
Collection Date : 04/14/14 12:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-01

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : MW-15-041414

Collected By : Karsten Springstead
Collection Date : 04/14/14 12:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260C | 04/20/14 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 99.6 | | % Rec. | 8260C | 04/20/14 | 1 |
| Dibromofluoromethane | 100. | | % Rec. | 8260C | 04/20/14 | 1 |
| 4-Bromofluorobenzene | 89.4 | | % Rec. | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Reported: 04/24/14 14:07 Printed: 04/24/14 14:08

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-02

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : MW-2-041414

Collected By : Karsten Springstead
Collection Date : 04/14/14 13:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-02

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : MW-2-041414

Collected By : Karsten Springstead
Collection Date : 04/14/14 13:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Tetrachloroethene | 3.2 | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260C | 04/20/14 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 101. | | % Rec. | 8260C | 04/20/14 | 1 |
| Dibromofluoromethane | 96.9 | | % Rec. | 8260C | 04/20/14 | 1 |
| 4-Bromofluorobenzene | 89.6 | | % Rec. | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-03

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : DC-13-041414

Collected By : Karsten Springstead
Collection Date : 04/14/14 15:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-03

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : DC-13-041414

Collected By : Karsten Springstead
Collection Date : 04/14/14 15:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Tetrachloroethene | 3.2 | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260C | 04/20/14 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 99.7 | | % Rec. | 8260C | 04/20/14 | 1 |
| Dibromofluoromethane | 102. | | % Rec. | 8260C | 04/20/14 | 1 |
| 4-Bromofluorobenzene | 92.8 | | % Rec. | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-04

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : DC-12-041514

Collected By : Karsten Springstead
Collection Date : 04/15/14 10:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-04

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : DC-12-041514

Collected By : Karsten Springstead
Collection Date : 04/15/14 10:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Tetrachloroethene | 1.4 | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260C | 04/20/14 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 101. | | % Rec. | 8260C | 04/20/14 | 1 |
| Dibromofluoromethane | 100. | | % Rec. | 8260C | 04/20/14 | 1 |
| 4-Bromofluorobenzene | 89.5 | | % Rec. | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-05

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : DC-20-041414

Collected By : Karsten Springstead
Collection Date : 04/14/14 16:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-05

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : DC-20-041414

Collected By : Karsten Springstead
Collection Date : 04/14/14 16:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Tetrachloroethene | 1.4 | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260C | 04/20/14 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 99.2 | | % Rec. | 8260C | 04/20/14 | 1 |
| Dibromofluoromethane | 97.6 | | % Rec. | 8260C | 04/20/14 | 1 |
| 4-Bromofluorobenzene | 89.0 | | % Rec. | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-06

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : KMW-9-041514

Collected By : Karsten Springstead
Collection Date : 04/15/14 11:45

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-06

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : KMW-9-041514

Collected By : Karsten Springstead
Collection Date : 04/15/14 11:45

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Tetrachloroethene | 1.0 | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260C | 04/20/14 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 99.2 | | % Rec. | 8260C | 04/20/14 | 1 |
| Dibromofluoromethane | 100. | | % Rec. | 8260C | 04/20/14 | 1 |
| 4-Bromofluorobenzene | 89.4 | | % Rec. | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-07

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : DC-11-041514

Collected By : Karsten Springstead
Collection Date : 04/15/14 12:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-07

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : DC-11-041514

Collected By : Karsten Springstead
Collection Date : 04/15/14 12:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Tetrachloroethene | 1.2 | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260C | 04/20/14 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 102. | | % Rec. | 8260C | 04/20/14 | 1 |
| Dibromofluoromethane | 100. | | % Rec. | 8260C | 04/20/14 | 1 |
| 4-Bromofluorobenzene | 89.0 | | % Rec. | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-08

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : DC-15-041514

Collected By : Karsten Springstead
Collection Date : 04/15/14 13:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260C | 04/20/14 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-08

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : DC-15-041514

Collected By : Karsten Springstead
Collection Date : 04/15/14 13:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260C | 04/20/14 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Tetrachloroethene | 10. | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260C | 04/20/14 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260C | 04/20/14 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 101. | | % Rec. | 8260C | 04/20/14 | 1 |
| Dibromofluoromethane | 98.1 | | % Rec. | 8260C | 04/20/14 | 1 |
| 4-Bromofluorobenzene | 89.6 | | % Rec. | 8260C | 04/20/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-09

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : EQ-1-041414

Collected By : Karsten Springstead
Collection Date : 04/14/14 16:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260C | 04/21/14 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260C | 04/21/14 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260C | 04/21/14 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260C | 04/23/14 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260C | 04/23/14 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260C | 04/21/14 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-09

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : EQ-1-041414

Collected By : Karsten Springstead
Collection Date : 04/14/14 16:30

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260C | 04/23/14 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260C | 04/23/14 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260C | 04/21/14 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 101. | | % Rec. | 8260C | 04/21/14 | 1 |
| Dibromofluoromethane | 99.7 | | % Rec. | 8260C | 04/21/14 | 1 |
| 4-Bromofluorobenzene | 104. | | % Rec. | 8260C | 04/21/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-10

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : EQ-2-041514

Collected By : Karsten Springstead
Collection Date : 04/15/14 14:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260C | 04/21/14 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260C | 04/21/14 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260C | 04/21/14 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260C | 04/23/14 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260C | 04/23/14 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260C | 04/21/14 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-10

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : EQ-2-041514

Collected By : Karsten Springstead
Collection Date : 04/15/14 14:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260C | 04/23/14 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260C | 04/23/14 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260C | 04/21/14 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260C | 04/21/14 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 101. | | % Rec. | 8260C | 04/21/14 | 1 |
| Dibromofluoromethane | 97.6 | | % Rec. | 8260C | 04/21/14 | 1 |
| 4-Bromofluorobenzene | 103. | | % Rec. | 8260C | 04/21/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Reported: 04/24/14 14:07 Printed: 04/24/14 14:08

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-11

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : TRIPBLANK-1

Collected By : Karsten Springstead
Collection Date : 04/14/14 00:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | |
| Acetone | BDL | 50. | ug/l | 8260C | 04/23/14 | 1 |
| Acrolein | BDL | 50. | ug/l | 8260C | 04/23/14 | 1 |
| Acrylonitrile | BDL | 10. | ug/l | 8260C | 04/23/14 | 1 |
| Benzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Bromobenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Bromodichloromethane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Bromoform | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Bromomethane | BDL | 5.0 | ug/l | 8260C | 04/23/14 | 1 |
| n-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| sec-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| tert-Butylbenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Carbon tetrachloride | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Chlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Chlorodibromomethane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Chloroethane | BDL | 5.0 | ug/l | 8260C | 04/23/14 | 1 |
| 2-Chloroethyl vinyl ether | BDL | 50. | ug/l | 8260C | 04/23/14 | 1 |
| Chloroform | BDL | 5.0 | ug/l | 8260C | 04/23/14 | 1 |
| Chloromethane | BDL | 2.5 | ug/l | 8260C | 04/23/14 | 1 |
| 2-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 4-Chlorotoluene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,2-Dibromo-3-Chloropropane | BDL | 5.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,2-Dibromoethane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Dibromomethane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,2-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,3-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,4-Dichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Dichlorodifluoromethane | BDL | 5.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,1-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,2-Dichloroethane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,1-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| cis-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| trans-1,2-Dichloroethene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,1-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,3-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| cis-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| trans-1,3-Dichloropropene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 2,2-Dichloropropane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Di-isopropyl ether | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Ethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Hexachloro-1,3-butadiene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Isopropylbenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| p-Isopropyltoluene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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Est. 1970

REPORT OF ANALYSIS

Kelly Rankich
PES Environmental, Inc.- WA
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

April 24,2014

ESC Sample # : L694055-11

Site ID : 1358.001.01.003

Project # : MVSC

Date Received : April 16, 2014
Description : Manhattan Village

Sample ID : TRIPBLANK-1

Collected By : Karsten Springstead
Collection Date : 04/14/14 00:00

| Parameter | Result | Det. Limit | Units | Method | Date | Dil. |
|---|---|---|---|---|---|---|
| 2-Butanone (MEK) | BDL | 10. | ug/l | 8260C | 04/23/14 | 1 |
| Methylene Chloride | BDL | 5.0 | ug/l | 8260C | 04/23/14 | 1 |
| 4-Methyl-2-pentanone (MIBK) | BDL | 10. | ug/l | 8260C | 04/23/14 | 1 |
| Methyl tert-butyl ether | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Naphthalene | BDL | 5.0 | ug/l | 8260C | 04/23/14 | 1 |
| n-Propylbenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Styrene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,1,1,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,1,2,2-Tetrachloroethane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,1,2-Trichlorotrifluoroethane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Tetrachloroethene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Toluene | BDL | 5.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,2,3-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,2,4-Trichlorobenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,1,1-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,1,2-Trichloroethane | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Trichloroethene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Trichlorofluoromethane | BDL | 5.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,2,3-Trichloropropane | BDL | 2.5 | ug/l | 8260C | 04/23/14 | 1 |
| 1,2,4-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,2,3-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| 1,3,5-Trimethylbenzene | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Vinyl chloride | BDL | 1.0 | ug/l | 8260C | 04/23/14 | 1 |
| Xylenes, Total | BDL | 3.0 | ug/l | 8260C | 04/23/14 | 1 |
| Surrogate Recovery | | | | | | |
| Toluene-d8 | 102. | | % Rec. | 8260C | 04/23/14 | 1 |
| Dibromofluoromethane | 103. | | % Rec. | 8260C | 04/23/14 | 1 |
| 4-Bromofluorobenzene | 99.9 | | % Rec. | 8260C | 04/23/14 | 1 |

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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Reported: 04/24/14 14:07 Printed: 04/24/14 14:08

Attachment A
List of Analytes with QC Qualifiers

| Sample Number | Work Group | Sample Type | Analyte | Run ID | Qualifier |
|---|---|---|---|---|---|
| L694055-01 | WG716856 | SAMP | Acrylonitrile | R2907105 | J4 |
| | WG716856 | SAMP | Chloromethane | R2907105 | J4 |
| | WG716856 | SAMP | 4-Methyl-2-pentanone (MIBK) | R2907105 | J4 |
| L694055-02 | WG716856 | SAMP | Acrylonitrile | R2907105 | J4 |
| | WG716856 | SAMP | Chloromethane | R2907105 | J4 |
| | WG716856 | SAMP | 4-Methyl-2-pentanone (MIBK) | R2907105 | J4 |
| L694055-03 | WG716856 | SAMP | Acrylonitrile | R2907105 | J4 |
| | WG716856 | SAMP | Chloromethane | R2907105 | J4 |
| | WG716856 | SAMP | 4-Methyl-2-pentanone (MIBK) | R2907105 | J4 |
| L694055-04 | WG716856 | SAMP | Acrylonitrile | R2907105 | J4 |
| | WG716856 | SAMP | Chloromethane | R2907105 | J4 |
| | WG716856 | SAMP | 4-Methyl-2-pentanone (MIBK) | R2907105 | J4 |
| L694055-05 | WG716856 | SAMP | Acrylonitrile | R2907105 | J4 |
| | WG716856 | SAMP | Chloromethane | R2907105 | J4 |
| | WG716856 | SAMP | 4-Methyl-2-pentanone (MIBK) | R2907105 | J4 |
| L694055-06 | WG716856 | SAMP | Acrylonitrile | R2907105 | J4 |
| | WG716856 | SAMP | Chloromethane | R2907105 | J4 |
| | WG716856 | SAMP | 4-Methyl-2-pentanone (MIBK) | R2907105 | J4 |
| L694055-07 | WG716856 | SAMP | Acrylonitrile | R2907105 | J4 |
| | WG716856 | SAMP | Chloromethane | R2907105 | J4 |
| | WG716856 | SAMP | 4-Methyl-2-pentanone (MIBK) | R2907105 | J4 |
| L694055-08 | WG716856 | SAMP | Acrylonitrile | R2907105 | J4 |
| | WG716856 | SAMP | Chloromethane | R2907105 | J4 |
| | WG716856 | SAMP | 4-Methyl-2-pentanone (MIBK) | R2907105 | J4 |

Attachment B
Explanation of QC Qualifier Codes

| Qualifier | Meaning |
|---|---|
| J4 | The associated batch QC was outside the established quality control range for accuracy. |

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
04/24/14 at 14:08:51

TSR Signing Reports: 358
R5 - Desired TAT

Sample: L694055-01 Account: PESENVSWA Received: 04/16/14 10:00 Due Date: 04/23/14 00:00 RPT Date: 04/24/14 14:07

Sample: L694055-02 Account: PESENVSWA Received: 04/16/14 10:00 Due Date: 04/23/14 00:00 RPT Date: 04/24/14 14:07

Sample: L694055-03 Account: PESENVSWA Received: 04/16/14 10:00 Due Date: 04/23/14 00:00 RPT Date: 04/24/14 14:07

Sample: L694055-04 Account: PESENVSWA Received: 04/16/14 10:00 Due Date: 04/23/14 00:00 RPT Date: 04/24/14 14:07

Sample: L694055-05 Account: PESENVSWA Received: 04/16/14 10:00 Due Date: 04/23/14 00:00 RPT Date: 04/24/14 14:07

Sample: L694055-06 Account: PESENVSWA Received: 04/16/14 10:00 Due Date: 04/23/14 00:00 RPT Date: 04/24/14 14:07

Sample: L694055-07 Account: PESENVSWA Received: 04/16/14 10:00 Due Date: 04/23/14 00:00 RPT Date: 04/24/14 14:07

Sample: L694055-08 Account: PESENVSWA Received: 04/16/14 10:00 Due Date: 04/23/14 00:00 RPT Date: 04/24/14 14:07

Sample: L694055-09 Account: PESENVSWA Received: 04/16/14 10:00 Due Date: 04/23/14 00:00 RPT Date: 04/24/14 14:07

Sample: L694055-10 Account: PESENVSWA Received: 04/16/14 10:00 Due Date: 04/23/14 00:00 RPT Date: 04/24/14 14:07

Sample: L694055-11 Account: PESENVSWA Received: 04/16/14 10:00 Due Date: 04/23/14 00:00 RPT Date: 04/24/14 14:07

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Tax I.D. 62-0814289

Est. 1970

PES Environmental, Inc.- WA
Kelly Rankich
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

Quality Assurance Report
Level II

L694055

April 24, 2014

Laboratory Blank

| Analyte | Result | Units | % Rec | Limit | Batch | Date Analyzed |
|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,1,1-Trichloroethane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,1,2,2-Tetrachloroethane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,1,2-Trichloroethane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,1,2-Trichlorotrifluoroethane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,1-Dichloroethane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,1-Dichloroethene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,1-Dichloropropene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,2,3-Trichlorobenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,2,3-Trichloropropane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,2,3-Trimethylbenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,2,4-Trichlorobenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,2,4-Trimethylbenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,2-Dibromo-3-Chloropropane | < .005 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,2-Dibromoethane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,2-Dichlorobenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,2-Dichloroethane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,2-Dichloropropane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,3,5-Trimethylbenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,3-Dichlorobenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,3-Dichloropropane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 1,4-Dichlorobenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 2,2-Dichloropropane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 2-Chlorotoluene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 4-Chlorotoluene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Acetone | < .05 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Acrolein | < .025 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Acrylonitrile | < .01 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Benzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Bromobenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Bromodichloromethane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Bromoform | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Bromomethane | < .005 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Carbon tetrachloride | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Chlorobenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Chlorodibromomethane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Chloroform | < .005 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Chloromethane | < .0025 | mg/l | | | WG716867 | 04/21/14 10:55 |
| cis-1,2-Dichloroethene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| cis-1,3-Dichloropropene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Dibromomethane | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Dichlorodifluoromethane | < .005 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Ethylbenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Hexachloro-1,3-butadiene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Isopropylbenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Methyl tert-butyl ether | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Methylene Chloride | < .005 | mg/l | | | WG716867 | 04/21/14 10:55 |
| n-Butylbenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| n-Propylbenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Naphthalene | < .005 | mg/l | | | WG716867 | 04/21/14 10:55 |
| p-Isopropyltoluene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| sec-Butylbenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Styrene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| tert-Butylbenzene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Tetrachloroethene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Toluene | < .005 | mg/l | | | WG716867 | 04/21/14 10:55 |
| trans-1,2-Dichloroethene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Trichloroethene | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Trichlorofluoromethane | < .005 | mg/l | | | WG716867 | 04/21/14 10:55 |

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Quality Assurance Report
Level II

L694055

April 24, 2014

Laboratory Blank

| Analyte | Result | Units | % Rec | Limit | Batch | Date Analyzed |
|---|---|---|---|---|---|---|
| Vinyl chloride | < .001 | mg/l | | | WG716867 | 04/21/14 10:55 |
| Xylenes, Total | < .003 | mg/l | | | WG716867 | 04/21/14 10:55 |
| 4-Bromofluorobenzene | | % Rec. | 105.0 | 71-126 | WG716867 | 04/21/14 10:55 |
| Dibromofluoromethane | | % Rec. | 98.40 | 78.3-121 | WG716867 | 04/21/14 10:55 |
| Toluene-d8 | | % Rec. | 101.0 | 88.5-111 | WG716867 | 04/21/14 10:55 |
| 1,1,1,2-Tetrachloroethane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,1,1-Trichloroethane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,1,2,2-Tetrachloroethane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,1,2-Trichloroethane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,1,2-Trichlorotrifluoroethane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,1-Dichloroethane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,1-Dichloroethene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,1-Dichloropropene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,2,3-Trichlorobenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,2,3-Trichloropropane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,2,3-Trimethylbenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,2,4-Trichlorobenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,2,4-Trimethylbenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,2-Dibromo-3-Chloropropane | < .005 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,2-Dibromoethane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,2-Dichlorobenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,2-Dichloroethane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,2-Dichloropropane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,3,5-Trimethylbenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,3-Dichlorobenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,3-Dichloropropane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 1,4-Dichlorobenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 2,2-Dichloropropane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 2-Butanone (MEK) | < .01 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 2-Chloroethyl vinyl ether | < .05 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 2-Chlorotoluene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 4-Chlorotoluene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 4-Methyl-2-pentanone (MIBK) | < .01 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Acetone | < .05 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Acrolein | < .025 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Acrylonitrile | < .01 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Benzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Bromobenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Bromodichloromethane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Bromoform | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Bromomethane | < .005 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Carbon tetrachloride | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Chlorobenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Chlorodibromomethane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Chloroethane | < .005 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Chloroform | < .005 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Chloromethane | < .0025 | mg/l | | | WG716856 | 04/20/14 13:11 |
| cis-1,2-Dichloroethene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| cis-1,3-Dichloropropene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Di-isopropyl ether | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Dibromomethane | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Dichlorodifluoromethane | < .005 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Ethylbenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Hexachloro-1,3-butadiene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Isopropylbenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Methyl tert-butyl ether | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Methylene Chloride | < .005 | mg/l | | | WG716856 | 04/20/14 13:11 |

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Quality Assurance Report
Level II

L694055

April 24, 2014

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| Analyte | Result | Units | % Rec | Limit | Batch | Date Analyzed |
|---|---|---|---|---|---|---|
| n-Butylbenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| n-Propylbenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Naphthalene | < .005 | mg/l | | | WG716856 | 04/20/14 13:11 |
| p-Isopropyltoluene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| sec-Butylbenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Styrene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| tert-Butylbenzene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Tetrachloroethene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Toluene | < .005 | mg/l | | | WG716856 | 04/20/14 13:11 |
| trans-1,2-Dichloroethene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| trans-1,3-Dichloropropene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Trichloroethene | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Trichlorofluoromethane | < .005 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Vinyl chloride | < .001 | mg/l | | | WG716856 | 04/20/14 13:11 |
| Xylenes, Total | < .003 | mg/l | | | WG716856 | 04/20/14 13:11 |
| 4-Bromofluorobenzene | | % Rec. | 92.90 | 71-126 | WG716856 | 04/20/14 13:11 |
| Dibromofluoromethane | | % Rec. | 99.40 | 78.3-121 | WG716856 | 04/20/14 13:11 |
| Toluene-d8 | | % Rec. | 101.0 | 88.5-111 | WG716856 | 04/20/14 13:11 |
| 1,1,1,2-Tetrachloroethane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,1,1-Trichloroethane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,1,2,2-Tetrachloroethane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,1,2-Trichloroethane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,1,2-Trichlorotrifluoroethane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,1-Dichloroethane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,1-Dichloroethene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,1-Dichloropropene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,2,3-Trichlorobenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,2,3-Trichloropropane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,2,3-Trimethylbenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,2,4-Trichlorobenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,2,4-Trimethylbenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,2-Dibromo-3-Chloropropane | < .005 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,2-Dibromoethane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,2-Dichlorobenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,2-Dichloroethane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,2-Dichloropropane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,3,5-Trimethylbenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,3-Dichlorobenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,3-Dichloropropane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 1,4-Dichlorobenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 2-Chloroethyl vinyl ether | < .05 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 2-Chlorotoluene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 4-Chlorotoluene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 4-Methyl-2-pentanone (MIBK) | < .01 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Acetone | < .05 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Acrolein | < .025 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Acrylonitrile | < .01 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Benzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Bromobenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Bromodichloromethane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Bromoform | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Bromomethane | < .005 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Carbon tetrachloride | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Chlorobenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Chlorodibromomethane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Chloroethane | < .005 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Chloroform | < .005 | mg/l | | | WG717362 | 04/22/14 23:24 |

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Quality Assurance Report
Level II

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April 24, 2014

Laboratory Blank

| Analyte | Result | Units | % Rec | Limit | Batch | Date Analyzed |
|---|---|---|---|---|---|---|
| Chloromethane | < .0025 | mg/l | | | WG717362 | 04/22/14 23:24 |
| cis-1,2-Dichloroethene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| cis-1,3-Dichloropropene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Di-isopropyl ether | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Dibromomethane | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Dichlorodifluoromethane | < .005 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Ethylbenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Hexachloro-1,3-butadiene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Isopropylbenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Methyl tert-butyl ether | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Methylene Chloride | < .005 | mg/l | | | WG717362 | 04/22/14 23:24 |
| n-Butylbenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| n-Propylbenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Naphthalene | < .005 | mg/l | | | WG717362 | 04/22/14 23:24 |
| p-Isopropyltoluene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| sec-Butylbenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Styrene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| tert-Butylbenzene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Tetrachloroethene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Toluene | < .005 | mg/l | | | WG717362 | 04/22/14 23:24 |
| trans-1,2-Dichloroethene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| trans-1,3-Dichloropropene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Trichloroethene | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Trichlorofluoromethane | < .005 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Vinyl chloride | < .001 | mg/l | | | WG717362 | 04/22/14 23:24 |
| Xylenes, Total | < .003 | mg/l | | | WG717362 | 04/22/14 23:24 |
| 4-Bromofluorobenzene | | % Rec. | 101.0 | 71-126 | WG717362 | 04/22/14 23:24 |
| Dibromofluoromethane | | % Rec. | 106.0 | 78.3-121 | WG717362 | 04/22/14 23:24 |
| Toluene-d8 | | % Rec. | 103.0 | 88.5-111 | WG717362 | 04/22/14 23:24 |
| 2,2-Dichloropropane | < .001 | mg/l | | | WG717315 | 04/23/14 14:10 |
| 2-Butanone (MEK) | < .01 | mg/l | | | WG717315 | 04/23/14 14:10 |
| 4-Bromofluorobenzene | | % Rec. | 97.40 | 71-126 | WG717315 | 04/23/14 14:10 |
| Dibromofluoromethane | | % Rec. | 103.0 | 78.3-121 | WG717315 | 04/23/14 14:10 |
| Toluene-d8 | | % Rec. | 99.10 | 88.5-111 | WG717315 | 04/23/14 14:10 |

Laboratory Control Sample

| Analyte | Units | Known Val | Result | % Rec | Limit | Batch |
|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | mg/l | .025 | 0.0240 | 96.0 | 74.2-124 | WG716867 |
| 1,1,1-Trichloroethane | mg/l | .025 | 0.0204 | 81.4 | 73.2-123 | WG716867 |
| 1,1,2,2-Tetrachloroethane | mg/l | .025 | 0.0222 | 88.7 | 70.7-122 | WG716867 |
| 1,1,2-Trichloroethane | mg/l | .025 | 0.0238 | 95.1 | 77.7-118 | WG716867 |
| 1,1,2-Trichlorotrifluoroethane | mg/l | .025 | 0.0231 | 92.3 | 67.2-143 | WG716867 |
| 1,1-Dichloroethane | mg/l | .025 | 0.0209 | 83.7 | 70.7-126 | WG716867 |
| 1,1-Dichloroethene | mg/l | .025 | 0.0215 | 86.1 | 67.8-129 | WG716867 |
| 1,1-Dichloropropene | mg/l | .025 | 0.0211 | 84.3 | 73.1-125 | WG716867 |
| 1,2,3-Trichlorobenzene | mg/l | .025 | 0.0248 | 99.2 | 64.9-135 | WG716867 |
| 1,2,3-Trichloropropane | mg/l | .025 | 0.0219 | 87.7 | 71.8-121 | WG716867 |
| 1,2,3-Trimethylbenzene | mg/l | .025 | 0.0194 | 77.7 | 72.3-116 | WG716867 |
| 1,2,4-Trichlorobenzene | mg/l | .025 | 0.0267 | 107. | 69.7-136 | WG716867 |
| 1,2,4-Trimethylbenzene | mg/l | .025 | 0.0238 | 95.3 | 75-123 | WG716867 |
| 1,2-Dibromo-3-Chloropropane | mg/l | .025 | 0.0238 | 95.3 | 65.4-128 | WG716867 |
| 1,2-Dibromoethane | mg/l | .025 | 0.0251 | 100. | 76.6-121 | WG716867 |
| 1,2-Dichlorobenzene | mg/l | .025 | 0.0239 | 95.5 | 78.4-117 | WG716867 |
| 1,2-Dichloroethane | mg/l | .025 | 0.0215 | 85.9 | 68.8-124 | WG716867 |
| 1,2-Dichloropropane | mg/l | .025 | 0.0217 | 86.7 | 76.5-119 | WG716867 |
| 1,3,5-Trimethylbenzene | mg/l | .025 | 0.0242 | 96.9 | 75.6-124 | WG716867 |

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Quality Assurance Report
Level II

L694055

April 24, 2014

| Analyte | Units | Laboratory Control Sample Known Val | Result | % Rec | Limit | Batch |
|---|---|---|---|---|---|---|
| 1,3-Dichlorobenzene | mg/l | .025 | 0.0256 | 102. | 70.8-128 | WG716867 |
| 1,3-Dichloropropane | mg/l | .025 | 0.0232 | 92.9 | 77.4-117 | WG716867 |
| 1,4-Dichlorobenzene | mg/l | .025 | 0.0241 | 96.4 | 78.8-115 | WG716867 |
| 2,2-Dichloropropane | mg/l | .025 | 0.0210 | 83.9 | 62.4-133 | WG716867 |
| 2-Chlorotoluene | mg/l | .025 | 0.0244 | 97.7 | 74.7-122 | WG716867 |
| 4-Chlorotoluene | mg/l | .025 | 0.0233 | 93.4 | 77.5-120 | WG716867 |
| Acetone | mg/l | .125 | 0.148 | 118. | 35.6-163 | WG716867 |
| Acrolein | mg/l | .125 | 0.103 | 82.4 | 10-190 | WG716867 |
| Acrylonitrile | mg/l | .125 | 0.0949 | 75.9 | 55.2-130 | WG716867 |
| Benzene | mg/l | .025 | 0.0203 | 81.4 | 74.8-121 | WG716867 |
| Bromobenzene | mg/l | .025 | 0.0237 | 95.0 | 77.5-116 | WG716867 |
| Bromodichloromethane | mg/l | .025 | 0.0202 | 80.7 | 75.1-116 | WG716867 |
| Bromoform | mg/l | .025 | 0.0256 | 103. | 67.5-130 | WG716867 |
| Bromomethane | mg/l | .025 | 0.0266 | 106. | 49.9-162 | WG716867 |
| Carbon tetrachloride | mg/l | .025 | 0.0223 | 89.1 | 70.2-123 | WG716867 |
| Chlorobenzene | mg/l | .025 | 0.0252 | 101. | 78.1-119 | WG716867 |
| Chlorodibromomethane | mg/l | .025 | 0.0246 | 98.6 | 74-121 | WG716867 |
| Chloroform | mg/l | .025 | 0.0209 | 83.8 | 76-121 | WG716867 |
| Chloromethane | mg/l | .025 | 0.0203 | 81.3 | 61.5-129 | WG716867 |
| cis-1,2-Dichloroethene | mg/l | .025 | 0.0207 | 82.9 | 76-119 | WG716867 |
| cis-1,3-Dichloropropene | mg/l | .025 | 0.0219 | 87.8 | 78.2-120 | WG716867 |
| Dibromomethane | mg/l | .025 | 0.0229 | 91.5 | 79.5-118 | WG716867 |
| Dichlorodifluoromethane | mg/l | .025 | 0.0266 | 107. | 54.8-135 | WG716867 |
| Ethylbenzene | mg/l | .025 | 0.0253 | 101. | 78.8-122 | WG716867 |
| Hexachloro-1,3-butadiene | mg/l | .025 | 0.0236 | 94.5 | 64.7-129 | WG716867 |
| Isopropylbenzene | mg/l | .025 | 0.0263 | 105. | 78.6-132 | WG716867 |
| Methyl tert-butyl ether | mg/l | .025 | 0.0203 | 81.3 | 71.2-126 | WG716867 |
| Methylene Chloride | mg/l | .025 | 0.0202 | 80.8 | 70.3-120 | WG716867 |
| n-Butylbenzene | mg/l | .025 | 0.0226 | 90.4 | 76.2-126 | WG716867 |
| n-Propylbenzene | mg/l | .025 | 0.0243 | 97.1 | 78.2-122 | WG716867 |
| Naphthalene | mg/l | .025 | 0.0235 | 94.1 | 68.4-128 | WG716867 |
| p-Isopropyltoluene | mg/l | .025 | 0.0255 | 102. | 74-131 | WG716867 |
| sec-Butylbenzene | mg/l | .025 | 0.0247 | 98.9 | 74.4-127 | WG716867 |
| Styrene | mg/l | .025 | 0.0255 | 102. | 80.4-126 | WG716867 |
| tert-Butylbenzene | mg/l | .025 | 0.0250 | 99.9 | 75.3-126 | WG716867 |
| Tetrachloroethene | mg/l | .025 | 0.0268 | 107. | 72.6-126 | WG716867 |
| Toluene | mg/l | .025 | 0.0217 | 86.7 | 79.7-116 | WG716867 |
| trans-1,2-Dichloroethene | mg/l | .025 | 0.0201 | 80.3 | 72.6-121 | WG716867 |
| Trichloroethene | mg/l | .025 | 0.0238 | 95.2 | 77.7-118 | WG716867 |
| Trichlorofluoromethane | mg/l | .025 | 0.0253 | 101. | 63.5-135 | WG716867 |
| Vinyl chloride | mg/l | .025 | 0.0226 | 90.5 | 65.9-128 | WG716867 |
| Xylenes, Total | mg/l | .075 | 0.0750 | 100. | 78.7-121 | WG716867 |
| 4-Bromofluorobenzene | | | | 104.0 | 71-126 | WG716867 |
| Dibromofluoromethane | | | | 96.50 | 78.3-121 | WG716867 |
| Toluene-d8 | | | | 102.0 | 88.5-111 | WG716867 |
| 1,1,1,2-Tetrachloroethane | mg/l | .025 | 0.0232 | 92.8 | 74.2-124 | WG716856 |
| 1,1,1-Trichloroethane | mg/l | .025 | 0.0268 | 107. | 73.2-123 | WG716856 |
| 1,1,2,2-Tetrachloroethane | mg/l | .025 | 0.0256 | 102. | 70.7-122 | WG716856 |
| 1,1,2-Trichloroethane | mg/l | .025 | 0.0251 | 101. | 77.7-118 | WG716856 |
| 1,1,2-Trichlorotrifluoroethane | mg/l | .025 | 0.0246 | 98.3 | 67.2-143 | WG716856 |
| 1,1-Dichloroethane | mg/l | .025 | 0.0285 | 114. | 70.7-126 | WG716856 |
| 1,1-Dichloroethene | mg/l | .025 | 0.0229 | 91.4 | 67.8-129 | WG716856 |
| 1,1-Dichloropropene | mg/l | .025 | 0.0273 | 109. | 73.1-125 | WG716856 |
| 1,2,3-Trichlorobenzene | mg/l | .025 | 0.0272 | 109. | 64.9-135 | WG716856 |
| 1,2,3-Trichloropropane | mg/l | .025 | 0.0243 | 97.3 | 71.8-121 | WG716856 |
| 1,2,3-Trimethylbenzene | mg/l | .025 | 0.0216 | 86.2 | 72.3-116 | WG716856 |
| 1,2,4-Trichlorobenzene | mg/l | .025 | 0.0270 | 108. | 69.7-136 | WG716856 |

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Est. 1970

PES Environmental, Inc.- WA
Kelly Rankich
1215 Fourth Ave., Suite 1350

Seattle, WA 98161

Quality Assurance Report
Level II

L694055

April 24, 2014

| Analyte | Units | Laboratory Control Sample Known Val | Result | % Rec | Limit | Batch |
|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | mg/l | .025 | 0.0234 | 93.7 | 75-123 | WG716856 |
| 1,2-Dibromo-3-Chloropropane | mg/l | .025 | 0.0302 | 121. | 65.4-128 | WG716856 |
| 1,2-Dibromoethane | mg/l | .025 | 0.0254 | 101. | 76.6-121 | WG716856 |
| 1,2-Dichlorobenzene | mg/l | .025 | 0.0249 | 99.6 | 78.4-117 | WG716856 |
| 1,2-Dichloroethane | mg/l | .025 | 0.0253 | 101. | 68.8-124 | WG716856 |
| 1,2-Dichloropropane | mg/l | .025 | 0.0263 | 105. | 76.5-119 | WG716856 |
| 1,3,5-Trimethylbenzene | mg/l | .025 | 0.0233 | 93.3 | 75.6-124 | WG716856 |
| 1,3-Dichlorobenzene | mg/l | .025 | 0.0224 | 89.7 | 70.8-128 | WG716856 |
| 1,3-Dichloropropane | mg/l | .025 | 0.0244 | 97.5 | 77.4-117 | WG716856 |
| 1,4-Dichlorobenzene | mg/l | .025 | 0.0226 | 90.3 | 78.8-115 | WG716856 |
| 2,2-Dichloropropane | mg/l | .025 | 0.0250 | 100. | 62.4-133 | WG716856 |
| 2-Butanone (MEK) | mg/l | .125 | 0.183 | 146. | 55-149 | WG716856 |
| 2-Chloroethyl vinyl ether | mg/l | .125 | 0.149 | 119. | 43.8-150 | WG716856 |
| 2-Chlorotoluene | mg/l | .025 | 0.0223 | 89.4 | 74.7-122 | WG716856 |
| 4-Chlorotoluene | mg/l | .025 | 0.0232 | 92.9 | 77.5-120 | WG716856 |
| 4-Methyl-2-pentanone (MIBK) | mg/l | .125 | 0.163 | 130. | 70.5-133 | WG716856 |
| Acetone | mg/l | .125 | 0.193 | 155. | 35.6-163 | WG716856 |
| Acrolein | mg/l | .125 | 0.0672 | 53.7 | 10-190 | WG716856 |
| Acrylonitrile | mg/l | .125 | 0.171 | 137.* | 55.2-130 | WG716856 |
| Benzene | mg/l | .025 | 0.0277 | 111. | 74.8-121 | WG716856 |
| Bromobenzene | mg/l | .025 | 0.0227 | 90.7 | 77.5-116 | WG716856 |
| Bromodichloromethane | mg/l | .025 | 0.0246 | 98.5 | 75.1-116 | WG716856 |
| Bromoform | mg/l | .025 | 0.0219 | 87.6 | 67.5-130 | WG716856 |
| Bromomethane | mg/l | .025 | 0.0248 | 99.1 | 49.9-162 | WG716856 |
| Carbon tetrachloride | mg/l | .025 | 0.0265 | 106. | 70.2-123 | WG716856 |
| Chlorobenzene | mg/l | .025 | 0.0231 | 92.3 | 78.1-119 | WG716856 |
| Chlorodibromomethane | mg/l | .025 | 0.0248 | 99.2 | 74-121 | WG716856 |
| Chloroethane | mg/l | .025 | 0.0209 | 83.8 | 61.7-135 | WG716856 |
| Chloroform | mg/l | .025 | 0.0269 | 108. | 76-121 | WG716856 |
| Chloromethane | mg/l | .025 | 0.0334 | 134.* | 61.5-129 | WG716856 |
| cis-1,2-Dichloroethene | mg/l | .025 | 0.0280 | 112. | 76-119 | WG716856 |
| cis-1,3-Dichloropropene | mg/l | .025 | 0.0275 | 110. | 78.2-120 | WG716856 |
| Di-isopropyl ether | mg/l | .025 | 0.0304 | 122. | 65.6-132 | WG716856 |
| Dibromomethane | mg/l | .025 | 0.0289 | 115. | 79.5-118 | WG716856 |
| Dichlorodifluoromethane | mg/l | .025 | 0.0260 | 104. | 54.8-135 | WG716856 |
| Ethylbenzene | mg/l | .025 | 0.0235 | 94.0 | 78.8-122 | WG716856 |
| Hexachloro-1,3-butadiene | mg/l | .025 | 0.0228 | 91.4 | 64.7-129 | WG716856 |
| Isopropylbenzene | mg/l | .025 | 0.0258 | 103. | 78.6-132 | WG716856 |
| Methyl tert-butyl ether | mg/l | .025 | 0.0298 | 119. | 71.2-126 | WG716856 |
| Methylene Chloride | mg/l | .025 | 0.0272 | 109. | 70.3-120 | WG716856 |
| n-Butylbenzene | mg/l | .025 | 0.0259 | 104. | 76.2-126 | WG716856 |
| n-Propylbenzene | mg/l | .025 | 0.0238 | 95.1 | 78.2-122 | WG716856 |
| Naphthalene | mg/l | .025 | 0.0290 | 116. | 68.4-128 | WG716856 |
| p-Isopropyltoluene | mg/l | .025 | 0.0236 | 94.5 | 74-131 | WG716856 |
| sec-Butylbenzene | mg/l | .025 | 0.0236 | 94.2 | 74.4-127 | WG716856 |
| Styrene | mg/l | .025 | 0.0248 | 99.0 | 80.4-126 | WG716856 |
| tert-Butylbenzene | mg/l | .025 | 0.0231 | 92.5 | 75.3-126 | WG716856 |
| Tetrachloroethene | mg/l | .025 | 0.0224 | 89.5 | 72.6-126 | WG716856 |
| Toluene | mg/l | .025 | 0.0258 | 103. | 79.7-116 | WG716856 |
| trans-1,2-Dichloroethene | mg/l | .025 | 0.0273 | 109. | 72.6-121 | WG716856 |
| trans-1,3-Dichloropropene | mg/l | .025 | 0.0263 | 105. | 74.3-123 | WG716856 |
| Trichloroethene | mg/l | .025 | 0.0246 | 98.6 | 77.7-118 | WG716856 |
| Trichlorofluoromethane | mg/l | .025 | 0.0220 | 88.0 | 63.5-135 | WG716856 |
| Vinyl chloride | mg/l | .025 | 0.0250 | 100. | 65.9-128 | WG716856 |
| Xylenes, Total | mg/l | .075 | 0.0702 | 93.6 | 78.7-121 | WG716856 |
| 4-Bromofluorobenzene | | | | 91.60 | 71-126 | WG716856 |
| Dibromofluoromethane | | | | 102.0 | 78.3-121 | WG716856 |
| Toluene-d8 | | | | 101.0 | 88.5-111 | WG716856 |

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Kelly Rankich
1215 Fourth Ave., Suite 1350

Seattle, WA 98161

Quality Assurance Report
Level II

L694055

April 24, 2014

| Analyte | Units | Laboratory Control Sample Known Val | Result | % Rec | Limit | Batch |
|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | mg/l | .025 | 0.0238 | 95.4 | 74.2-124 | WG717362 |
| 1,1,1-Trichloroethane | mg/l | .025 | 0.0257 | 103. | 73.2-123 | WG717362 |
| 1,1,2,2-Tetrachloroethane | mg/l | .025 | 0.0227 | 90.7 | 70.7-122 | WG717362 |
| 1,1,2-Trichloroethane | mg/l | .025 | 0.0234 | 93.8 | 77.7-118 | WG717362 |
| 1,1,2-Trichlorotrifluoroethane | mg/l | .025 | 0.0279 | 112. | 67.2-143 | WG717362 |
| 1,1-Dichloroethane | mg/l | .025 | 0.0267 | 107. | 70.7-126 | WG717362 |
| 1,1-Dichloroethene | mg/l | .025 | 0.0278 | 111. | 67.8-129 | WG717362 |
| 1,1-Dichloropropene | mg/l | .025 | 0.0270 | 108. | 73.1-125 | WG717362 |
| 1,2,3-Trichlorobenzene | mg/l | .025 | 0.0230 | 92.0 | 64.9-135 | WG717362 |
| 1,2,3-Trichloropropane | mg/l | .025 | 0.0243 | 97.3 | 71.8-121 | WG717362 |
| 1,2,3-Trimethylbenzene | mg/l | .025 | 0.0200 | 80.1 | 72.3-116 | WG717362 |
| 1,2,4-Trichlorobenzene | mg/l | .025 | 0.0246 | 98.3 | 69.7-136 | WG717362 |
| 1,2,4-Trimethylbenzene | mg/l | .025 | 0.0233 | 93.1 | 75-123 | WG717362 |
| 1,2-Dibromo-3-Chloropropane | mg/l | .025 | 0.0225 | 90.0 | 65.4-128 | WG717362 |
| 1,2-Dibromoethane | mg/l | .025 | 0.0261 | 104. | 76.6-121 | WG717362 |
| 1,2-Dichlorobenzene | mg/l | .025 | 0.0233 | 93.3 | 78.4-117 | WG717362 |
| 1,2-Dichloroethane | mg/l | .025 | 0.0249 | 99.7 | 68.8-124 | WG717362 |
| 1,2-Dichloropropane | mg/l | .025 | 0.0247 | 98.9 | 76.5-119 | WG717362 |
| 1,3,5-Trimethylbenzene | mg/l | .025 | 0.0244 | 97.5 | 75.6-124 | WG717362 |
| 1,3-Dichlorobenzene | mg/l | .025 | 0.0246 | 98.2 | 70.8-128 | WG717362 |
| 1,3-Dichloropropane | mg/l | .025 | 0.0249 | 99.7 | 77.4-117 | WG717362 |
| 1,4-Dichlorobenzene | mg/l | .025 | 0.0238 | 95.1 | 78.8-115 | WG717362 |
| 2-Chloroethyl vinyl ether | mg/l | .125 | 0.129 | 103. | 43.8-150 | WG717362 |
| 2-Chlorotoluene | mg/l | .025 | 0.0242 | 96.8 | 74.7-122 | WG717362 |
| 4-Chlorotoluene | mg/l | .025 | 0.0248 | 99.3 | 77.5-120 | WG717362 |
| 4-Methyl-2-pentanone (MIBK) | mg/l | .125 | 0.125 | 100. | 70.5-133 | WG717362 |
| Acetone | mg/l | .125 | 0.151 | 121. | 35.6-163 | WG717362 |
| Acrolein | mg/l | .125 | 0.123 | 98.7 | 10-190 | WG717362 |
| Acrylonitrile | mg/l | .125 | 0.130 | 104. | 55.2-130 | WG717362 |
| Benzene | mg/l | .025 | 0.0259 | 104. | 74.8-121 | WG717362 |
| Bromobenzene | mg/l | .025 | 0.0234 | 93.5 | 77.5-116 | WG717362 |
| Bromodichloromethane | mg/l | .025 | 0.0228 | 91.1 | 75.1-116 | WG717362 |
| Bromoform | mg/l | .025 | 0.0230 | 92.1 | 67.5-130 | WG717362 |
| Bromomethane | mg/l | .025 | 0.0320 | 128. | 49.9-162 | WG717362 |
| Carbon tetrachloride | mg/l | .025 | 0.0258 | 103. | 70.2-123 | WG717362 |
| Chlorobenzene | mg/l | .025 | 0.0250 | 100. | 78.1-119 | WG717362 |
| Chlorodibromomethane | mg/l | .025 | 0.0234 | 93.5 | 74-121 | WG717362 |
| Chloroethane | mg/l | .025 | 0.0302 | 121. | 61.7-135 | WG717362 |
| Chloroform | mg/l | .025 | 0.0255 | 102. | 76-121 | WG717362 |
| Chloromethane | mg/l | .025 | 0.0292 | 117. | 61.5-129 | WG717362 |
| cis-1,2-Dichloroethene | mg/l | .025 | 0.0253 | 101. | 76-119 | WG717362 |
| cis-1,3-Dichloropropene | mg/l | .025 | 0.0249 | 99.5 | 78.2-120 | WG717362 |
| Di-isopropyl ether | mg/l | .025 | 0.0238 | 95.3 | 65.6-132 | WG717362 |
| Dibromomethane | mg/l | .025 | 0.0259 | 104. | 79.5-118 | WG717362 |
| Dichlorodifluoromethane | mg/l | .025 | 0.0278 | 111. | 54.8-135 | WG717362 |
| Ethylbenzene | mg/l | .025 | 0.0251 | 101. | 78.8-122 | WG717362 |
| Hexachloro-1,3-butadiene | mg/l | .025 | 0.0228 | 91.3 | 64.7-129 | WG717362 |
| Isopropylbenzene | mg/l | .025 | 0.0265 | 106. | 78.6-132 | WG717362 |
| Methyl tert-butyl ether | mg/l | .025 | 0.0241 | 96.5 | 71.2-126 | WG717362 |
| Methylene Chloride | mg/l | .025 | 0.0276 | 110. | 70.3-120 | WG717362 |
| n-Butylbenzene | mg/l | .025 | 0.0243 | 97.2 | 76.2-126 | WG717362 |
| n-Propylbenzene | mg/l | .025 | 0.0252 | 101. | 78.2-122 | WG717362 |
| Naphthalene | mg/l | .025 | 0.0234 | 93.5 | 68.4-128 | WG717362 |
| p-Isopropyltoluene | mg/l | .025 | 0.0246 | 98.6 | 74-131 | WG717362 |
| sec-Butylbenzene | mg/l | .025 | 0.0243 | 97.3 | 74.4-127 | WG717362 |
| Styrene | mg/l | .025 | 0.0261 | 104. | 80.4-126 | WG717362 |
| tert-Butylbenzene | mg/l | .025 | 0.0246 | 98.4 | 75.3-126 | WG717362 |
| Tetrachloroethene | mg/l | .025 | 0.0262 | 105. | 72.6-126 | WG717362 |

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Seattle, WA 98161

Quality Assurance Report
Level II

L694055

April 24, 2014

Laboratory Control Sample

| Analyte | Units | Known Val | Result | % Rec | Limit | Batch |
|---|---|---|---|---|---|---|
| Toluene | mg/l | .025 | 0.0244 | 97.6 | 79.7-116 | WG717362 |
| trans-1,2-Dichloroethene | mg/l | .025 | 0.0263 | 105. | 72.6-121 | WG717362 |
| trans-1,3-Dichloropropene | mg/l | .025 | 0.0235 | 94.0 | 74.3-123 | WG717362 |
| Trichloroethene | mg/l | .025 | 0.0261 | 104. | 77.7-118 | WG717362 |
| Trichlorofluoromethane | mg/l | .025 | 0.0292 | 117. | 63.5-135 | WG717362 |
| Vinyl chloride | mg/l | .025 | 0.0285 | 114. | 65.9-128 | WG717362 |
| Xylenes, Total | mg/l | .075 | 0.0742 | 99.0 | 78.7-121 | WG717362 |
| 4-Bromofluorobenzene | | | | 102.0 | 71-126 | WG717362 |
| Dibromofluoromethane | | | | 106.0 | 78.3-121 | WG717362 |
| Toluene-d8 | | | | 103.0 | 88.5-111 | WG717362 |
| 2,2-Dichloropropane | mg/l | .025 | 0.0257 | 103. | 62.4-133 | WG717315 |
| 2-Butanone (MEK) | mg/l | .125 | 0.137 | 110. | 55-149 | WG717315 |
| 4-Bromofluorobenzene | | | | 95.70 | 71-126 | WG717315 |
| Dibromofluoromethane | | | | 106.0 | 78.3-121 | WG717315 |
| Toluene-d8 | | | | 100.0 | 88.5-111 | WG717315 |

Laboratory Control Sample Duplicate

| Analyte | Units | Result | Ref | %Rec | Limit | RPD | Limit | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0247 | 0.0240 | 99.0 | 74.2-124 | 2.68 | 20 | WG716867 |
| 1,1,1-Trichloroethane | mg/l | 0.0209 | 0.0204 | 84.0 | 73.2-123 | 2.67 | 20 | WG716867 |
| 1,1,2,2-Tetrachloroethane | mg/l | 0.0234 | 0.0222 | 93.0 | 70.7-122 | 5.19 | 20 | WG716867 |
| 1,1,2-Trichloroethane | mg/l | 0.0248 | 0.0238 | 99.0 | 77.7-118 | 4.18 | 20 | WG716867 |
| 1,1,2-Trichlorotrifluoroethane | mg/l | 0.0237 | 0.0231 | 95.0 | 67.2-143 | 2.50 | 20 | WG716867 |
| 1,1-Dichloroethane | mg/l | 0.0213 | 0.0209 | 85.0 | 70.7-126 | 1.89 | 20 | WG716867 |
| 1,1-Dichloroethene | mg/l | 0.0217 | 0.0215 | 87.0 | 67.8-129 | 1.02 | 20 | WG716867 |
| 1,1-Dichloropropene | mg/l | 0.0212 | 0.0211 | 85.0 | 73.1-125 | 0.450 | 20 | WG716867 |
| 1,2,3-Trichlorobenzene | mg/l | 0.0260 | 0.0248 | 104. | 64.9-135 | 4.69 | 20 | WG716867 |
| 1,2,3-Trichloropropane | mg/l | 0.0238 | 0.0219 | 95.0 | 71.8-121 | 8.09 | 20 | WG716867 |
| 1,2,3-Trimethylbenzene | mg/l | 0.0197 | 0.0194 | 79.0 | 72.3-116 | 1.42 | 20 | WG716867 |
| 1,2,4-Trichlorobenzene | mg/l | 0.0275 | 0.0267 | 110. | 69.7-136 | 2.93 | 20 | WG716867 |
| 1,2,4-Trimethylbenzene | mg/l | 0.0242 | 0.0238 | 97.0 | 75-123 | 1.58 | 20 | WG716867 |
| 1,2-Dibromo-3-Chloropropane | mg/l | 0.0249 | 0.0238 | 100. | 65.4-128 | 4.46 | 20 | WG716867 |
| 1,2-Dibromoethane | mg/l | 0.0261 | 0.0251 | 104. | 76.6-121 | 4.01 | 20 | WG716867 |
| 1,2-Dichlorobenzene | mg/l | 0.0246 | 0.0239 | 98.0 | 78.4-117 | 3.22 | 20 | WG716867 |
| 1,2-Dichloroethane | mg/l | 0.0221 | 0.0215 | 88.0 | 68.8-124 | 2.75 | 20 | WG716867 |
| 1,2-Dichloropropane | mg/l | 0.0223 | 0.0217 | 89.0 | 76.5-119 | 2.86 | 20 | WG716867 |
| 1,3,5-Trimethylbenzene | mg/l | 0.0250 | 0.0242 | 100. | 75.6-124 | 2.93 | 20 | WG716867 |
| 1,3-Dichlorobenzene | mg/l | 0.0261 | 0.0256 | 104. | 70.8-128 | 1.99 | 20 | WG716867 |
| 1,3-Dichloropropane | mg/l | 0.0240 | 0.0232 | 96.0 | 77.4-117 | 3.44 | 20 | WG716867 |
| 1,4-Dichlorobenzene | mg/l | 0.0245 | 0.0241 | 98.0 | 78.8-115 | 1.69 | 20 | WG716867 |
| 2,2-Dichloropropane | mg/l | 0.0211 | 0.0210 | 84.0 | 62.4-133 | 0.730 | 20 | WG716867 |
| 2-Chlorotoluene | mg/l | 0.0248 | 0.0244 | 99.0 | 74.7-122 | 1.43 | 20 | WG716867 |
| 4-Chlorotoluene | mg/l | 0.0237 | 0.0233 | 95.0 | 77.5-120 | 1.61 | 20 | WG716867 |
| Acetone | mg/l | 0.164 | 0.148 | 131. | 35.6-163 | 10.6 | 23.9 | WG716867 |
| Acrolein | mg/l | 0.108 | 0.103 | 87.0 | 10-190 | 5.15 | 28.1 | WG716867 |
| Acrylonitrile | mg/l | 0.100 | 0.0949 | 80.0 | 55.2-130 | 5.76 | 20 | WG716867 |
| Benzene | mg/l | 0.0210 | 0.0203 | 84.0 | 74.8-121 | 2.99 | 20 | WG716867 |
| Bromobenzene | mg/l | 0.0244 | 0.0237 | 98.0 | 77.5-116 | 2.87 | 20 | WG716867 |
| Bromodichloromethane | mg/l | 0.0209 | 0.0202 | 84.0 | 75.1-116 | 3.77 | 20 | WG716867 |
| Bromoform | mg/l | 0.0268 | 0.0256 | 107. | 67.5-130 | 4.49 | 20 | WG716867 |
| Bromomethane | mg/l | 0.0278 | 0.0266 | 111. | 49.9-162 | 4.74 | 20 | WG716867 |
| Carbon tetrachloride | mg/l | 0.0224 | 0.0223 | 89.0 | 70.2-123 | 0.390 | 20 | WG716867 |
| Chlorobenzene | mg/l | 0.0257 | 0.0252 | 103. | 78.1-119 | 2.16 | 20 | WG716867 |
| Chlorodibromomethane | mg/l | 0.0256 | 0.0246 | 102. | 74-121 | 3.72 | 20 | WG716867 |
| Chloroform | mg/l | 0.0214 | 0.0209 | 86.0 | 76-121 | 2.14 | 20 | WG716867 |
| Chloromethane | mg/l | 0.0202 | 0.0203 | 81.0 | 61.5-129 | 0.860 | 20 | WG716867 |

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Est. 1970

PES Environmental, Inc.- WA
Kelly Rankich
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

Quality Assurance Report
Level II

L694055

April 24, 2014

| Analyte | Units | Laboratory Control Sample Result | Ref | %Rec | Limit | Duplicate RPD | Limit | Batch |
|---|---|---|---|---|---|---|---|---|
| cis-1,2-Dichloroethene | mg/l | 0.0214 | 0.0207 | 86.0 | 76-119 | 3.40 | 20 | WG716867 |
| cis-1,3-Dichloropropene | mg/l | 0.0227 | 0.0219 | 91.0 | 78.2-120 | 3.16 | 20 | WG716867 |
| Dibromomethane | mg/l | 0.0235 | 0.0229 | 94.0 | 79.5-118 | 2.55 | 20 | WG716867 |
| Dichlorodifluoromethane | mg/l | 0.0266 | 0.0266 | 106. | 54.8-135 | 0.120 | 20 | WG716867 |
| Ethylbenzene | mg/l | 0.0256 | 0.0253 | 102. | 78.8-122 | 1.35 | 20 | WG716867 |
| Hexachloro-1,3-butadiene | mg/l | 0.0245 | 0.0236 | 98.0 | 64.7-129 | 3.74 | 20 | WG716867 |
| Isopropylbenzene | mg/l | 0.0266 | 0.0263 | 106. | 78.6-132 | 1.23 | 20 | WG716867 |
| Methyl tert-butyl ether | mg/l | 0.0212 | 0.0203 | 85.0 | 71.2-126 | 4.23 | 20 | WG716867 |
| Methylene Chloride | mg/l | 0.0207 | 0.0202 | 83.0 | 70.3-120 | 2.68 | 20 | WG716867 |
| n-Butylbenzene | mg/l | 0.0229 | 0.0226 | 92.0 | 76.2-126 | 1.43 | 20 | WG716867 |
| n-Propylbenzene | mg/l | 0.0247 | 0.0243 | 99.0 | 78.2-122 | 1.81 | 20 | WG716867 |
| Naphthalene | mg/l | 0.0250 | 0.0235 | 100. | 68.4-128 | 5.91 | 20 | WG716867 |
| p-Isopropyltoluene | mg/l | 0.0259 | 0.0255 | 104. | 74-131 | 1.32 | 20 | WG716867 |
| sec-Butylbenzene | mg/l | 0.0250 | 0.0247 | 100. | 74.4-127 | 1.17 | 20 | WG716867 |
| Styrene | mg/l | 0.0260 | 0.0255 | 104. | 80.4-126 | 1.93 | 20 | WG716867 |
| tert-Butylbenzene | mg/l | 0.0256 | 0.0250 | 102. | 75.3-126 | 2.45 | 20 | WG716867 |
| Tetrachloroethene | mg/l | 0.0272 | 0.0268 | 109. | 72.6-126 | 1.63 | 20 | WG716867 |
| Toluene | mg/l | 0.0222 | 0.0217 | 89.0 | 79.7-116 | 2.56 | 20 | WG716867 |
| trans-1,2-Dichloroethene | mg/l | 0.0202 | 0.0201 | 81.0 | 72.6-121 | 0.670 | 20 | WG716867 |
| Trichloroethene | mg/l | 0.0243 | 0.0238 | 97.0 | 77.7-118 | 1.96 | 20 | WG716867 |
| Trichlorofluoromethane | mg/l | 0.0260 | 0.0253 | 104. | 63.5-135 | 2.66 | 20 | WG716867 |
| Vinyl chloride | mg/l | 0.0224 | 0.0226 | 90.0 | 65.9-128 | 0.760 | 20 | WG716867 |
| Xylenes, Total | mg/l | 0.0759 | 0.0750 | 101. | 78.7-121 | 1.25 | 20 | WG716867 |
| 4-Bromofluorobenzene | | | | 105.0 | 71-126 | | | WG716867 |
| Dibromofluoromethane | | | | 96.30 | 78.3-121 | | | WG716867 |
| Toluene-d8 | | | | 103.0 | 88.5-111 | | | WG716867 |
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0232 | 0.0232 | 93.0 | 74.2-124 | 0.120 | 20 | WG716856 |
| 1,1,1-Trichloroethane | mg/l | 0.0256 | 0.0268 | 102. | 73.2-123 | 4.48 | 20 | WG716856 |
| 1,1,2,2-Tetrachloroethane | mg/l | 0.0264 | 0.0256 | 106. | 70.7-122 | 3.07 | 20 | WG716856 |
| 1,1,2-Trichloroethane | mg/l | 0.0258 | 0.0251 | 103. | 77.7-118 | 2.67 | 20 | WG716856 |
| 1,1,2-Trichlorotrifluoroethane | mg/l | 0.0237 | 0.0246 | 95.0 | 67.2-143 | 3.51 | 20 | WG716856 |
| 1,1-Dichloroethane | mg/l | 0.0274 | 0.0285 | 110. | 70.7-126 | 3.99 | 20 | WG716856 |
| 1,1-Dichloroethene | mg/l | 0.0228 | 0.0229 | 91.0 | 67.8-129 | 0.170 | 20 | WG716856 |
| 1,1-Dichloropropene | mg/l | 0.0268 | 0.0273 | 107. | 73.1-125 | 1.62 | 20 | WG716856 |
| 1,2,3-Trichlorobenzene | mg/l | 0.0275 | 0.0272 | 110. | 64.9-135 | 1.19 | 20 | WG716856 |
| 1,2,3-Trichloropropane | mg/l | 0.0244 | 0.0243 | 98.0 | 71.8-121 | 0.430 | 20 | WG716856 |
| 1,2,3-Trimethylbenzene | mg/l | 0.0215 | 0.0216 | 86.0 | 72.3-116 | 0.100 | 20 | WG716856 |
| 1,2,4-Trichlorobenzene | mg/l | 0.0267 | 0.0270 | 107. | 69.7-136 | 1.28 | 20 | WG716856 |
| 1,2,4-Trimethylbenzene | mg/l | 0.0234 | 0.0234 | 93.0 | 75-123 | 0.280 | 20 | WG716856 |
| 1,2-Dibromo-3-Chloropropane | mg/l | 0.0303 | 0.0302 | 121. | 65.4-128 | 0.430 | 20 | WG716856 |
| 1,2-Dibromoethane | mg/l | 0.0262 | 0.0254 | 105. | 76.6-121 | 3.14 | 20 | WG716856 |
| 1,2-Dichlorobenzene | mg/l | 0.0249 | 0.0249 | 99.0 | 78.4-117 | 0.160 | 20 | WG716856 |
| 1,2-Dichloroethane | mg/l | 0.0252 | 0.0253 | 101. | 68.8-124 | 0.510 | 20 | WG716856 |
| 1,2-Dichloropropane | mg/l | 0.0270 | 0.0263 | 108. | 76.5-119 | 2.51 | 20 | WG716856 |
| 1,3,5-Trimethylbenzene | mg/l | 0.0234 | 0.0233 | 94.0 | 75.6-124 | 0.470 | 20 | WG716856 |
| 1,3-Dichlorobenzene | mg/l | 0.0227 | 0.0224 | 91.0 | 70.8-128 | 1.10 | 20 | WG716856 |
| 1,3-Dichloropropane | mg/l | 0.0250 | 0.0244 | 100. | 77.4-117 | 2.48 | 20 | WG716856 |
| 1,4-Dichlorobenzene | mg/l | 0.0229 | 0.0226 | 92.0 | 78.8-115 | 1.45 | 20 | WG716856 |
| 2,2-Dichloropropane | mg/l | 0.0248 | 0.0250 | 99.0 | 62.4-133 | 0.760 | 20 | WG716856 |
| 2-Butanone (MEK) | mg/l | 0.178 | 0.183 | 142. | 55-149 | 2.68 | 20 | WG716856 |
| 2-Chloroethyl vinyl ether | mg/l | 0.157 | 0.149 | 125. | 43.8-150 | 5.22 | 20 | WG716856 |
| 2-Chlorotoluene | mg/l | 0.0226 | 0.0223 | 90.0 | 74.7-122 | 0.920 | 20 | WG716856 |
| 4-Chlorotoluene | mg/l | 0.0234 | 0.0232 | 94.0 | 77.5-120 | 0.600 | 20 | WG716856 |
| 4-Methyl-2-pentanone (MIBK) | mg/l | 0.168 | 0.163 | 134* | 70.5-133 | 2.83 | 20 | WG716856 |
| Acetone | mg/l | 0.183 | 0.193 | 146. | 35.6-163 | 5.45 | 23.9 | WG716856 |
| Acrolein | mg/l | 0.0677 | 0.0672 | 54.0 | 10-190 | 0.810 | 28.1 | WG716856 |
| Acrylonitrile | mg/l | 0.172 | 0.171 | 137* | 55.2-130 | 0.500 | 20 | WG716856 |

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Est. 1970

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Quality Assurance Report
Level II

L694055

April 24, 2014

| Analyte | Units | Laboratory Control Sample Result | Ref | %Rec | Limit | Duplicate RPD | Limit | Batch |
|---|---|---|---|---|---|---|---|---|
| Benzene | mg/l | 0.0270 | 0.0277 | 108. | 74.8-121 | 2.41 | 20 | WG716856 |
| Bromobenzene | mg/l | 0.0232 | 0.0227 | 93.0 | 77.5-116 | 2.06 | 20 | WG716856 |
| Bromodichloromethane | mg/l | 0.0257 | 0.0246 | 103. | 75.1-116 | 4.15 | 20 | WG716856 |
| Bromoform | mg/l | 0.0229 | 0.0219 | 92.0 | 67.5-130 | 4.42 | 20 | WG716856 |
| Bromomethane | mg/l | 0.0252 | 0.0248 | 101. | 49.9-162 | 1.55 | 20 | WG716856 |
| Carbon tetrachloride | mg/l | 0.0262 | 0.0265 | 105. | 70.2-123 | 0.900 | 20 | WG716856 |
| Chlorobenzene | mg/l | 0.0232 | 0.0231 | 93.0 | 78.1-119 | 0.550 | 20 | WG716856 |
| Chlorodibromomethane | mg/l | 0.0255 | 0.0248 | 102. | 74-121 | 2.87 | 20 | WG716856 |
| Chloroethane | mg/l | 0.0214 | 0.0209 | 86.0 | 61.7-135 | 2.39 | 20 | WG716856 |
| Chloroform | mg/l | 0.0265 | 0.0269 | 106. | 76-121 | 1.37 | 20 | WG716856 |
| Chloromethane | mg/l | 0.0324 | 0.0334 | 130* | 61.5-129 | 3.05 | 20 | WG716856 |
| cis-1,2-Dichloroethene | mg/l | 0.0276 | 0.0280 | 110. | 76-119 | 1.50 | 20 | WG716856 |
| cis-1,3-Dichloropropene | mg/l | 0.0280 | 0.0275 | 112. | 78.2-120 | 1.83 | 20 | WG716856 |
| Di-isopropyl ether | mg/l | 0.0297 | 0.0304 | 119. | 65.6-132 | 2.43 | 20 | WG716856 |
| Dibromomethane | mg/l | 0.0286 | 0.0289 | 114. | 79.5-118 | 0.900 | 20 | WG716856 |
| Dichlorodifluoromethane | mg/l | 0.0261 | 0.0260 | 104. | 54.8-135 | 0.120 | 20 | WG716856 |
| Ethylbenzene | mg/l | 0.0240 | 0.0235 | 96.0 | 78.8-122 | 2.28 | 20 | WG716856 |
| Hexachloro-1,3-butadiene | mg/l | 0.0231 | 0.0228 | 92.0 | 64.7-129 | 1.02 | 20 | WG716856 |
| Isopropylbenzene | mg/l | 0.0258 | 0.0258 | 103. | 78.6-132 | 0.0100 | 20 | WG716856 |
| Methyl tert-butyl ether | mg/l | 0.0295 | 0.0298 | 118. | 71.2-126 | 0.970 | 20 | WG716856 |
| Methylene Chloride | mg/l | 0.0265 | 0.0272 | 106. | 70.3-120 | 2.59 | 20 | WG716856 |
| n-Butylbenzene | mg/l | 0.0263 | 0.0259 | 105. | 76.2-126 | 1.22 | 20 | WG716856 |
| n-Propylbenzene | mg/l | 0.0239 | 0.0238 | 96.0 | 78.2-122 | 0.730 | 20 | WG716856 |
| Naphthalene | mg/l | 0.0296 | 0.0290 | 118. | 68.4-128 | 2.07 | 20 | WG716856 |
| p-Isopropyltoluene | mg/l | 0.0240 | 0.0236 | 96.0 | 74-131 | 1.80 | 20 | WG716856 |
| sec-Butylbenzene | mg/l | 0.0239 | 0.0236 | 96.0 | 74.4-127 | 1.52 | 20 | WG716856 |
| Styrene | mg/l | 0.0255 | 0.0248 | 102. | 80.4-126 | 3.08 | 20 | WG716856 |
| tert-Butylbenzene | mg/l | 0.0235 | 0.0231 | 94.0 | 75.3-126 | 1.71 | 20 | WG716856 |
| Tetrachloroethene | mg/l | 0.0220 | 0.0224 | 88.0 | 72.6-126 | 1.70 | 20 | WG716856 |
| Toluene | mg/l | 0.0261 | 0.0258 | 104. | 79.7-116 | 0.940 | 20 | WG716856 |
| trans-1,2-Dichloroethene | mg/l | 0.0265 | 0.0273 | 106. | 72.6-121 | 2.93 | 20 | WG716856 |
| trans-1,3-Dichloropropene | mg/l | 0.0265 | 0.0263 | 106. | 74.3-123 | 0.960 | 20 | WG716856 |
| Trichloroethene | mg/l | 0.0250 | 0.0246 | 100. | 77.7-118 | 1.42 | 20 | WG716856 |
| Trichlorofluoromethane | mg/l | 0.0210 | 0.0220 | 84.0 | 63.5-135 | 4.44 | 20 | WG716856 |
| Vinyl chloride | mg/l | 0.0251 | 0.0250 | 100. | 65.9-128 | 0.300 | 20 | WG716856 |
| Xylenes, Total | mg/l | 0.0708 | 0.0702 | 94.0 | 78.7-121 | 0.910 | 20 | WG716856 |
| 4-Bromofluorobenzene | | | | 92.20 | 71-126 | | | WG716856 |
| Dibromofluoromethane | | | | 100.0 | 78.3-121 | | | WG716856 |
| Toluene-d8 | | | | 102.0 | 88.5-111 | | | WG716856 |
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0246 | 0.0238 | 98.0 | 74.2-124 | 2.98 | 20 | WG717362 |
| 1,1,1-Trichloroethane | mg/l | 0.0262 | 0.0257 | 105. | 73.2-123 | 2.09 | 20 | WG717362 |
| 1,1,2,2-Tetrachloroethane | mg/l | 0.0241 | 0.0227 | 96.0 | 70.7-122 | 5.93 | 20 | WG717362 |
| 1,1,2-Trichloroethane | mg/l | 0.0247 | 0.0234 | 99.0 | 77.7-118 | 5.35 | 20 | WG717362 |
| 1,1,2-Trichlorotrifluoroethane | mg/l | 0.0277 | 0.0279 | 111. | 67.2-143 | 0.540 | 20 | WG717362 |
| 1,1-Dichloroethane | mg/l | 0.0277 | 0.0267 | 111. | 70.7-126 | 3.89 | 20 | WG717362 |
| 1,1-Dichloroethene | mg/l | 0.0278 | 0.0278 | 111. | 67.8-129 | 0.0400 | 20 | WG717362 |
| 1,1-Dichloropropene | mg/l | 0.0277 | 0.0270 | 111. | 73.1-125 | 2.80 | 20 | WG717362 |
| 1,2,3-Trichlorobenzene | mg/l | 0.0250 | 0.0230 | 100. | 64.9-135 | 8.41 | 20 | WG717362 |
| 1,2,3-Trichloropropane | mg/l | 0.0251 | 0.0243 | 100. | 71.8-121 | 3.16 | 20 | WG717362 |
| 1,2,3-Trimethylbenzene | mg/l | 0.0213 | 0.0200 | 85.0 | 72.3-116 | 5.94 | 20 | WG717362 |
| 1,2,4-Trichlorobenzene | mg/l | 0.0267 | 0.0246 | 107. | 69.7-136 | 8.24 | 20 | WG717362 |
| 1,2,4-Trimethylbenzene | mg/l | 0.0241 | 0.0233 | 96.0 | 75-123 | 3.49 | 20 | WG717362 |
| 1,2-Dibromo-3-Chloropropane | mg/l | 0.0249 | 0.0225 | 99.0 | 65.4-128 | 9.99 | 20 | WG717362 |
| 1,2-Dibromoethane | mg/l | 0.0273 | 0.0261 | 109. | 76.6-121 | 4.52 | 20 | WG717362 |
| 1,2-Dichlorobenzene | mg/l | 0.0249 | 0.0233 | 100. | 78.4-117 | 6.68 | 20 | WG717362 |
| 1,2-Dichloroethane | mg/l | 0.0262 | 0.0249 | 105. | 68.8-124 | 5.02 | 20 | WG717362 |
| 1,2-Dichloropropane | mg/l | 0.0259 | 0.0247 | 104. | 76.5-119 | 4.56 | 20 | WG717362 |

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Quality Assurance Report
Level II

L694055

April 24, 2014

| | | Laboratory Control Sample Duplicate | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Analyte | Units | Result | Ref | %Rec | Limit | RPD | Limit | Batch |
| 1,3,5-Trimethylbenzene | mg/l | 0.0255 | 0.0244 | 102. | 75.6-124 | 4.30 | 20 | WG717362 |
| 1,3-Dichlorobenzene | mg/l | 0.0257 | 0.0246 | 103. | 70.8-128 | 4.71 | 20 | WG717362 |
| 1,3-Dichloropropane | mg/l | 0.0257 | 0.0249 | 103. | 77.4-117 | 3.22 | 20 | WG717362 |
| 1,4-Dichlorobenzene | mg/l | 0.0252 | 0.0238 | 101. | 78.8-115 | 5.97 | 20 | WG717362 |
| 2-Chloroethyl vinyl ether | mg/l | 0.139 | 0.129 | 111. | 43.8-150 | 6.90 | 20 | WG717362 |
| 2-Chlorotoluene | mg/l | 0.0252 | 0.0242 | 101. | 74.7-122 | 4.02 | 20 | WG717362 |
| 4-Chlorotoluene | mg/l | 0.0264 | 0.0248 | 106. | 77.5-120 | 6.10 | 20 | WG717362 |
| 4-Methyl-2-pentanone (MIBK) | mg/l | 0.130 | 0.125 | 104. | 70.5-133 | 4.28 | 20 | WG717362 |
| Acetone | mg/l | 0.159 | 0.151 | 128. | 35.6-163 | 5.61 | 23.9 | WG717362 |
| Acrolein | mg/l | 0.121 | 0.123 | 97.0 | 10-190 | 1.81 | 28.1 | WG717362 |
| Acrylonitrile | mg/l | 0.134 | 0.130 | 108. | 55.2-130 | 3.76 | 20 | WG717362 |
| Benzene | mg/l | 0.0266 | 0.0259 | 106. | 74.8-121 | 2.77 | 20 | WG717362 |
| Bromobenzene | mg/l | 0.0244 | 0.0234 | 98.0 | 77.5-116 | 4.27 | 20 | WG717362 |
| Bromodichloromethane | mg/l | 0.0234 | 0.0228 | 94.0 | 75.1-116 | 2.59 | 20 | WG717362 |
| Bromoform | mg/l | 0.0240 | 0.0230 | 96.0 | 67.5-130 | 4.11 | 20 | WG717362 |
| Bromomethane | mg/l | 0.0318 | 0.0320 | 127. | 49.9-162 | 0.480 | 20 | WG717362 |
| Carbon tetrachloride | mg/l | 0.0263 | 0.0258 | 105. | 70.2-123 | 2.20 | 20 | WG717362 |
| Chlorobenzene | mg/l | 0.0262 | 0.0250 | 105. | 78.1-119 | 4.50 | 20 | WG717362 |
| Chlorodibromomethane | mg/l | 0.0244 | 0.0234 | 98.0 | 74-121 | 4.34 | 20 | WG717362 |
| Chloroethane | mg/l | 0.0310 | 0.0302 | 124. | 61.7-135 | 2.88 | 20 | WG717362 |
| Chloroform | mg/l | 0.0265 | 0.0255 | 106. | 76-121 | 3.52 | 20 | WG717362 |
| Chloromethane | mg/l | 0.0284 | 0.0292 | 114. | 61.5-129 | 2.59 | 20 | WG717362 |
| cis-1,2-Dichloroethene | mg/l | 0.0268 | 0.0253 | 107. | 76-119 | 5.91 | 20 | WG717362 |
| cis-1,3-Dichloropropene | mg/l | 0.0254 | 0.0249 | 101. | 78.2-120 | 1.91 | 20 | WG717362 |
| Di-isopropyl ether | mg/l | 0.0247 | 0.0238 | 99.0 | 65.6-132 | 3.72 | 20 | WG717362 |
| Dibromomethane | mg/l | 0.0267 | 0.0259 | 107. | 79.5-118 | 2.91 | 20 | WG717362 |
| Dichlorodifluoromethane | mg/l | 0.0270 | 0.0278 | 108. | 54.8-135 | 3.00 | 20 | WG717362 |
| Ethylbenzene | mg/l | 0.0261 | 0.0251 | 104. | 78.8-122 | 3.67 | 20 | WG717362 |
| Hexachloro-1,3-butadiene | mg/l | 0.0242 | 0.0228 | 97.0 | 64.7-129 | 6.00 | 20 | WG717362 |
| Isopropylbenzene | mg/l | 0.0277 | 0.0265 | 111. | 78.6-132 | 4.12 | 20 | WG717362 |
| Methyl tert-butyl ether | mg/l | 0.0248 | 0.0241 | 99.0 | 71.2-126 | 2.96 | 20 | WG717362 |
| Methylene Chloride | mg/l | 0.0281 | 0.0276 | 112. | 70.3-120 | 1.96 | 20 | WG717362 |
| n-Butylbenzene | mg/l | 0.0261 | 0.0243 | 104. | 76.2-126 | 7.22 | 20 | WG717362 |
| n-Propylbenzene | mg/l | 0.0261 | 0.0252 | 104. | 78.2-122 | 3.53 | 20 | WG717362 |
| Naphthalene | mg/l | 0.0253 | 0.0234 | 101. | 68.4-128 | 8.04 | 20 | WG717362 |
| p-Isopropyltoluene | mg/l | 0.0261 | 0.0246 | 104. | 74-131 | 5.70 | 20 | WG717362 |
| sec-Butylbenzene | mg/l | 0.0257 | 0.0243 | 103. | 74.4-127 | 5.39 | 20 | WG717362 |
| Styrene | mg/l | 0.0276 | 0.0261 | 110. | 80.4-126 | 5.83 | 20 | WG717362 |
| tert-Butylbenzene | mg/l | 0.0258 | 0.0246 | 103. | 75.3-126 | 4.93 | 20 | WG717362 |
| Tetrachloroethene | mg/l | 0.0259 | 0.0262 | 104. | 72.6-126 | 0.820 | 20 | WG717362 |
| Toluene | mg/l | 0.0251 | 0.0244 | 100. | 79.7-116 | 2.64 | 20 | WG717362 |
| trans-1,2-Dichloroethene | mg/l | 0.0270 | 0.0263 | 108. | 72.6-121 | 2.60 | 20 | WG717362 |
| trans-1,3-Dichloropropene | mg/l | 0.0234 | 0.0235 | 94.0 | 74.3-123 | 0.490 | 20 | WG717362 |
| Trichloroethene | mg/l | 0.0265 | 0.0261 | 106. | 77.7-118 | 1.75 | 20 | WG717362 |
| Trichlorofluoromethane | mg/l | 0.0292 | 0.0292 | 117. | 63.5-135 | 0.310 | 20 | WG717362 |
| Vinyl chloride | mg/l | 0.0286 | 0.0285 | 114. | 65.9-128 | 0.290 | 20 | WG717362 |
| Xylenes, Total | mg/l | 0.0764 | 0.0742 | 102. | 78.7-121 | 2.88 | 20 | WG717362 |
| 4-Bromofluorobenzene | | | | 103.0 | 71-126 | | | WG717362 |
| Dibromofluoromethane | | | | 106.0 | 78.3-121 | | | WG717362 |
| Toluene-d8 | | | | 102.0 | 88.5-111 | | | WG717362 |
| 2,2-Dichloropropane | mg/l | 0.0248 | 0.0257 | 99.0 | 62.4-133 | 3.59 | 20 | WG717315 |
| 2-Butanone (MEK) | mg/l | 0.131 | 0.137 | 105. | 55-149 | 4.92 | 20 | WG717315 |
| 4-Bromofluorobenzene | | | | 95.30 | 71-126 | | | WG717315 |
| Dibromofluoromethane | | | | 105.0 | 78.3-121 | | | WG717315 |
| Toluene-d8 | | | | 101.0 | 88.5-111 | | | WG717315 |

* Performance of this Analyte is outside of established criteria.
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Est. 1970

PES Environmental, Inc.- WA
Kelly Rankich
1215 Fourth Ave., Suite 1350

Seattle, WA 98161

Quality Assurance Report
Level II

April 24, 2014

L694055

| Analyte | Units | Matrix Spike MS Res | Ref Res | TV | % Rec | Limit | Ref Samp | Batch |
|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0242 | 0.0 | .025 | 97.0 | 64-128 | L694093-01 | WG716867 |
| 1,1,1-Trichloroethane | mg/l | 0.0203 | 0.0 | .025 | 81.0 | 58.7-134 | L694093-01 | WG716867 |
| 1,1,2,2-Tetrachloroethane | mg/l | 0.0218 | 0.0 | .025 | 87.0 | 56-132 | L694093-01 | WG716867 |
| 1,1,2-Trichloroethane | mg/l | 0.0234 | 0.0 | .025 | 94.0 | 66.3-125 | L694093-01 | WG716867 |
| 1,1,2-Trichlorotrifluoroethane | mg/l | 0.0233 | 0.0 | .025 | 93.0 | 54.8-154 | L694093-01 | WG716867 |
| 1,1-Dichloroethane | mg/l | 0.0207 | 0.0 | .025 | 83.0 | 58.5-132 | L694093-01 | WG716867 |
| 1,1-Dichloroethene | mg/l | 0.0212 | 0.0 | .025 | 85.0 | 51.1-140 | L694093-01 | WG716867 |
| 1,1-Dichloropropene | mg/l | 0.0208 | 0.0 | .025 | 83.0 | 57.3-136 | L694093-01 | WG716867 |
| 1,2,3-Trichlorobenzene | mg/l | 0.0243 | 0.0 | .025 | 97.0 | 59.1-138 | L694093-01 | WG716867 |
| 1,2,3-Trichloropropane | mg/l | 0.0228 | 0.0 | .025 | 91.0 | 61.4-128 | L694093-01 | WG716867 |
| 1,2,3-Trimethylbenzene | mg/l | 0.0191 | 0.0 | .025 | 76.0 | 61.3-122 | L694093-01 | WG716867 |
| 1,2,4-Trichlorobenzene | mg/l | 0.0256 | 0.0 | .025 | 100. | 63.6-143 | L694093-01 | WG716867 |
| 1,2,4-Trimethylbenzene | mg/l | 0.0232 | 0.0 | .025 | 93.0 | 57.4-137 | L694093-01 | WG716867 |
| 1,2-Dibromo-3-Chloropropane | mg/l | 0.0239 | 0.0 | .025 | 96.0 | 57.3-136 | L694093-01 | WG716867 |
| 1,2-Dibromoethane | mg/l | 0.0248 | 0.0 | .025 | 99.0 | 67.1-125 | L694093-01 | WG716867 |
| 1,2-Dichlorobenzene | mg/l | 0.0235 | 0.0 | .025 | 94.0 | 68.2-123 | L694093-01 | WG716867 |
| 1,2-Dichloroethane | mg/l | 0.0210 | 0.0 | .025 | 84.0 | 60-126 | L694093-01 | WG716867 |
| 1,2-Dichloropropane | mg/l | 0.0216 | 0.0 | .025 | 86.0 | 64.2-123 | L694093-01 | WG716867 |
| 1,3,5-Trimethylbenzene | mg/l | 0.0236 | 0.0 | .025 | 94.0 | 63.6-132 | L694093-01 | WG716867 |
| 1,3-Dichlorobenzene | mg/l | 0.0255 | 0.0 | .025 | 100. | 63.1-131 | L694093-01 | WG716867 |
| 1,3-Dichloropropane | mg/l | 0.0231 | 0.0 | .025 | 92.0 | 67.9-121 | L694093-01 | WG716867 |
| 1,4-Dichlorobenzene | mg/l | 0.0237 | 0.0 | .025 | 95.0 | 68.6-123 | L694093-01 | WG716867 |
| 2,2-Dichloropropane | mg/l | 0.0205 | 0.0 | .025 | 82.0 | 50.5-144 | L694093-01 | WG716867 |
| 2-Chlorotoluene | mg/l | 0.0244 | 0.0 | .025 | 98.0 | 63.6-128 | L694093-01 | WG716867 |
| 4-Chlorotoluene | mg/l | 0.0230 | 0.0 | .025 | 92.0 | 65.7-127 | L694093-01 | WG716867 |
| Acetone | mg/l | 0.0979 | 0.00324 | .125 | 76.0 | 10-130 | L694093-01 | WG716867 |
| Acrolein | mg/l | 0.0887 | 0.0 | .125 | 71.0 | 10-200 | L694093-01 | WG716867 |
| Acrylonitrile | mg/l | 0.0959 | 0.0 | .125 | 77.0 | 49.4-133 | L694093-01 | WG716867 |
| Benzene | mg/l | 0.0200 | 0.0 | .025 | 80.0 | 54.3-133 | L694093-01 | WG716867 |
| Bromobenzene | mg/l | 0.0234 | 0.0 | .025 | 94.0 | 63.9-124 | L694093-01 | WG716867 |
| Bromodichloromethane | mg/l | 0.0244 | 0.00507 | .025 | 78.0 | 63.9-121 | L694093-01 | WG716867 |
| Bromoform | mg/l | 0.0257 | 0.0 | .025 | 100. | 59.5-134 | L694093-01 | WG716867 |
| Bromomethane | mg/l | 0.0243 | 0.0 | .025 | 97.0 | 41.7-155 | L694093-01 | WG716867 |
| Carbon tetrachloride | mg/l | 0.0221 | 0.0 | .025 | 88.0 | 55.7-134 | L694093-01 | WG716867 |
| Chlorobenzene | mg/l | 0.0248 | 0.0 | .025 | 99.0 | 67-125 | L694093-01 | WG716867 |
| Chlorodibromomethane | mg/l | 0.0255 | 0.00100 | .025 | 98.0 | 64.3-125 | L694093-01 | WG716867 |
| Chloroform | mg/l | 0.0428 | 0.0300 | .025 | 51.0* | 63-129 | L694093-01 | WG716867 |
| Chloromethane | mg/l | 0.0208 | 0.0 | .025 | 83.0 | 42.4-135 | L694093-01 | WG716867 |
| cis-1,2-Dichloroethene | mg/l | 0.0208 | 0.0 | .025 | 83.0 | 59.2-129 | L694093-01 | WG716867 |
| cis-1,3-Dichloropropene | mg/l | 0.0215 | 0.0 | .025 | 86.0 | 66.4-125 | L694093-01 | WG716867 |
| Dibromomethane | mg/l | 0.0224 | 0.0 | .025 | 89.0 | 68.2-124 | L694093-01 | WG716867 |
| Dichlorodifluoromethane | mg/l | 0.0264 | 0.0 | .025 | 110. | 40.6-144 | L694093-01 | WG716867 |
| Ethylbenzene | mg/l | 0.0247 | 0.0 | .025 | 99.0 | 61.4-133 | L694093-01 | WG716867 |
| Hexachloro-1,3-butadiene | mg/l | 0.0229 | 0.0 | .025 | 92.0 | 55.1-136 | L694093-01 | WG716867 |
| Isopropylbenzene | mg/l | 0.0262 | 0.0 | .025 | 100. | 66.8-141 | L694093-01 | WG716867 |
| Methyl tert-butyl ether | mg/l | 0.0199 | 0.0 | .025 | 79.0 | 57.7-134 | L694093-01 | WG716867 |
| Methylene Chloride | mg/l | 0.0202 | 0.0 | .025 | 81.0 | 58.1-122 | L694093-01 | WG716867 |
| n-Butylbenzene | mg/l | 0.0221 | 0.0 | .025 | 88.0 | 62.7-140 | L694093-01 | WG716867 |
| n-Propylbenzene | mg/l | 0.0239 | 0.0 | .025 | 96.0 | 65.9-131 | L694093-01 | WG716867 |
| Naphthalene | mg/l | 0.0230 | 0.0 | .025 | 92.0 | 58-135 | L694093-01 | WG716867 |
| p-Isopropyltoluene | mg/l | 0.0249 | 0.0 | .025 | 100. | 63.2-139 | L694093-01 | WG716867 |
| sec-Butylbenzene | mg/l | 0.0242 | 0.0 | .025 | 97.0 | 62.2-136 | L694093-01 | WG716867 |
| Styrene | mg/l | 0.0208 | 0.0 | .025 | 83.0 | 66.8-133 | L694093-01 | WG716867 |
| tert-Butylbenzene | mg/l | 0.0247 | 0.0 | .025 | 99.0 | 63.3-134 | L694093-01 | WG716867 |
| Tetrachloroethene | mg/l | 0.0267 | 0.0 | .025 | 110. | 53-139 | L694093-01 | WG716867 |
| Toluene | mg/l | 0.0215 | 0.0 | .025 | 86.0 | 61.4-130 | L694093-01 | WG716867 |
| trans-1,2-Dichloroethene | mg/l | 0.0197 | 0.0 | .025 | 79.0 | 56.5-129 | L694093-01 | WG716867 |
| Trichloroethene | mg/l | 0.0233 | 0.0 | .025 | 93.0 | 44.1-149 | L694093-01 | WG716867 |
| Trichlorofluoromethane | mg/l | 0.0257 | 0.0 | .025 | 100. | 49.6-145 | L694093-01 | WG716867 |
| Vinyl chloride | mg/l | 0.0223 | 0.0 | .025 | 89.0 | 47.8-137 | L694093-01 | WG716867 |

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Est. 1970

PES Environmental, Inc.- WA
Kelly Rankich
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

Quality Assurance Report
Level II

April 24, 2014

L694055

| Analyte | Units | Matrix Spike MS Res | Ref Res | TV | % Rec | Limit | Ref Samp | Batch |
|---|---|---|---|---|---|---|---|---|
| Xylenes, Total | mg/l | 0.0739 | 0.0 | .075 | 98.0 | 63.3-131 | L694093-01 | WG716867 |
| 4-Bromofluorobenzene | | | | | 105.0 | 71-126 | | WG716867 |
| Dibromofluoromethane | | | | | 96.30 | 78.3-121 | | WG716867 |
| Toluene-d8 | | | | | 102.0 | 88.5-111 | | WG716867 |
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0235 | 0.0 | .025 | 94.0 | 64-128 | L694007-01 | WG716856 |
| 1,1,1-Trichloroethane | mg/l | 0.0264 | 0.0 | .025 | 100. | 58.7-134 | L694007-01 | WG716856 |
| 1,1,2,2-Tetrachloroethane | mg/l | 0.0271 | 0.0 | .025 | 110. | 56-132 | L694007-01 | WG716856 |
| 1,1,2-Trichloroethane | mg/l | 0.0257 | 0.0 | .025 | 100. | 66.3-125 | L694007-01 | WG716856 |
| 1,1,2-Trichlorotrifluoroethane | mg/l | 0.0239 | 0.0 | .025 | 96.0 | 54.8-154 | L694007-01 | WG716856 |
| 1,1-Dichloroethane | mg/l | 0.0284 | 0.0 | .025 | 110. | 58.5-132 | L694007-01 | WG716856 |
| 1,1-Dichloroethene | mg/l | 0.0230 | 0.0 | .025 | 92.0 | 51.1-140 | L694007-01 | WG716856 |
| 1,1-Dichloropropene | mg/l | 0.0266 | 0.0 | .025 | 110. | 57.3-136 | L694007-01 | WG716856 |
| 1,2,3-Trichlorobenzene | mg/l | 0.0271 | 0.0 | .025 | 110. | 59.1-138 | L694007-01 | WG716856 |
| 1,2,3-Trichloropropane | mg/l | 0.0246 | 0.0 | .025 | 98.0 | 61.4-128 | L694007-01 | WG716856 |
| 1,2,3-Trimethylbenzene | mg/l | 0.0214 | 0.0 | .025 | 86.0 | 61.3-122 | L694007-01 | WG716856 |
| 1,2,4-Trichlorobenzene | mg/l | 0.0274 | 0.0 | .025 | 110. | 63.6-143 | L694007-01 | WG716856 |
| 1,2,4-Trimethylbenzene | mg/l | 0.0236 | 0.0 | .025 | 94.0 | 57.4-137 | L694007-01 | WG716856 |
| 1,2-Dibromo-3-Chloropropane | mg/l | 0.0291 | 0.0 | .025 | 120. | 57.3-136 | L694007-01 | WG716856 |
| 1,2-Dibromoethane | mg/l | 0.0265 | 0.0 | .025 | 110. | 67.1-125 | L694007-01 | WG716856 |
| 1,2-Dichlorobenzene | mg/l | 0.0248 | 0.0 | .025 | 99.0 | 68.2-123 | L694007-01 | WG716856 |
| 1,2-Dichloroethane | mg/l | 0.0255 | 0.0 | .025 | 100. | 60-126 | L694007-01 | WG716856 |
| 1,2-Dichloropropane | mg/l | 0.0265 | 0.0 | .025 | 110. | 64.2-123 | L694007-01 | WG716856 |
| 1,3,5-Trimethylbenzene | mg/l | 0.0237 | 0.0 | .025 | 95.0 | 63.6-132 | L694007-01 | WG716856 |
| 1,3-Dichlorobenzene | mg/l | 0.0231 | 0.0 | .025 | 92.0 | 63.1-131 | L694007-01 | WG716856 |
| 1,3-Dichloropropane | mg/l | 0.0251 | 0.0 | .025 | 100. | 67.9-121 | L694007-01 | WG716856 |
| 1,4-Dichlorobenzene | mg/l | 0.0228 | 0.0 | .025 | 91.0 | 68.6-123 | L694007-01 | WG716856 |
| 2,2-Dichloropropane | mg/l | 0.0253 | 0.0 | .025 | 100. | 50.5-144 | L694007-01 | WG716856 |
| 2-Butanone (MEK) | mg/l | 0.178 | 0.0 | .125 | 140.* | 22.4-138 | L694007-01 | WG716856 |
| 2-Chloroethyl vinyl ether | mg/l | 0.00399 | 0.0 | .125 | 3.20* | 10-155 | L694007-01 | WG716856 |
| 2-Chlorotoluene | mg/l | 0.0231 | 0.0 | .025 | 92.0 | 63.6-128 | L694007-01 | WG716856 |
| 4-Chlorotoluene | mg/l | 0.0238 | 0.0 | .025 | 95.0 | 65.7-127 | L694007-01 | WG716856 |
| 4-Methyl-2-pentanone (MIBK) | mg/l | 0.166 | 0.0 | .125 | 130. | 60.8-140 | L694007-01 | WG716856 |
| Acetone | mg/l | 0.170 | 0.00183 | .125 | 140.* | 10-130 | L694007-01 | WG716856 |
| Acrolein | mg/l | 0.207 | 0.0 | .125 | 170. | 10-200 | L694007-01 | WG716856 |
| Acrylonitrile | mg/l | 0.177 | 0.0 | .125 | 140.* | 49.4-133 | L694007-01 | WG716856 |
| Benzene | mg/l | 0.0269 | 0.0 | .025 | 110. | 54.3-133 | L694007-01 | WG716856 |
| Bromobenzene | mg/l | 0.0235 | 0.0 | .025 | 94.0 | 63.9-124 | L694007-01 | WG716856 |
| Bromodichloromethane | mg/l | 0.0243 | 0.0 | .025 | 97.0 | 63.9-121 | L694007-01 | WG716856 |
| Bromoform | mg/l | 0.0227 | 0.0 | .025 | 91.0 | 59.5-134 | L694007-01 | WG716856 |
| Bromomethane | mg/l | 0.0241 | 0.0 | .025 | 96.0 | 41.7-155 | L694007-01 | WG716856 |
| Carbon tetrachloride | mg/l | 0.0263 | 0.0 | .025 | 100. | 55.7-134 | L694007-01 | WG716856 |
| Chlorobenzene | mg/l | 0.0235 | 0.0 | .025 | 94.0 | 67-125 | L694007-01 | WG716856 |
| Chlorodibromomethane | mg/l | 0.0255 | 0.0 | .025 | 100. | 64.3-125 | L694007-01 | WG716856 |
| Chloroethane | mg/l | 0.0209 | 0.0 | .025 | 84.0 | 51.5-136 | L694007-01 | WG716856 |
| Chloroform | mg/l | 0.0264 | 0.0 | .025 | 110. | 63-129 | L694007-01 | WG716856 |
| Chloromethane | mg/l | 0.0322 | 0.0 | .025 | 130. | 42.4-135 | L694007-01 | WG716856 |
| cis-1,2-Dichloroethene | mg/l | 0.0280 | 0.0 | .025 | 110. | 59.2-129 | L694007-01 | WG716856 |
| cis-1,3-Dichloropropene | mg/l | 0.0269 | 0.0 | .025 | 110. | 66.4-125 | L694007-01 | WG716856 |
| Di-isopropyl ether | mg/l | 0.0294 | 0.0 | .025 | 120. | 56.9-136 | L694007-01 | WG716856 |
| Dibromomethane | mg/l | 0.0282 | 0.0 | .025 | 110. | 68.2-124 | L694007-01 | WG716856 |
| Dichlorodifluoromethane | mg/l | 0.0263 | 0.0 | .025 | 100. | 40.6-144 | L694007-01 | WG716856 |
| Ethylbenzene | mg/l | 0.0239 | 0.0 | .025 | 96.0 | 61.4-133 | L694007-01 | WG716856 |
| Hexachloro-1,3-butadiene | mg/l | 0.0235 | 0.0 | .025 | 94.0 | 55.1-136 | L694007-01 | WG716856 |
| Isopropylbenzene | mg/l | 0.0266 | 0.0 | .025 | 110. | 66.8-141 | L694007-01 | WG716856 |
| Methyl tert-butyl ether | mg/l | 0.0297 | 0.0 | .025 | 120. | 57.7-134 | L694007-01 | WG716856 |
| Methylene Chloride | mg/l | 0.0272 | 0.000322 | .025 | 110. | 58.1-122 | L694007-01 | WG716856 |
| n-Butylbenzene | mg/l | 0.0259 | 0.0 | .025 | 100. | 62.7-140 | L694007-01 | WG716856 |

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Est. 1970

PES Environmental, Inc.- WA
Kelly Rankich
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

Quality Assurance Report
Level II

April 24, 2014

L694055

| Analyte | Units | Matrix Spike MS Res | Ref Res | TV | % Rec | Limit | Ref Samp | Batch |
|---|---|---|---|---|---|---|---|---|
| n-Propylbenzene | mg/l | 0.0243 | 0.0 | .025 | 97.0 | 65.9-131 | L694007-01 | WG716856 |
| Naphthalene | mg/l | 0.0293 | 0.0 | .025 | 120. | 58-135 | L694007-01 | WG716856 |
| p-Isopropyltoluene | mg/l | 0.0243 | 0.0 | .025 | 97.0 | 63.2-139 | L694007-01 | WG716856 |
| sec-Butylbenzene | mg/l | 0.0241 | 0.0 | .025 | 96.0 | 62.2-136 | L694007-01 | WG716856 |
| Styrene | mg/l | 0.0257 | 0.0 | .025 | 100. | 66.8-133 | L694007-01 | WG716856 |
| tert-Butylbenzene | mg/l | 0.0238 | 0.0 | .025 | 95.0 | 63.3-134 | L694007-01 | WG716856 |
| Tetrachloroethene | mg/l | 0.0255 | 0.00342 | .025 | 88.0 | 53-139 | L694007-01 | WG716856 |
| Toluene | mg/l | 0.0256 | 0.0 | .025 | 100. | 61.4-130 | L694007-01 | WG716856 |
| trans-1,2-Dichloroethene | mg/l | 0.0265 | 0.0 | .025 | 110. | 56.5-129 | L694007-01 | WG716856 |
| trans-1,3-Dichloropropene | mg/l | 0.0259 | 0.0 | .025 | 100. | 64.1-128 | L694007-01 | WG716856 |
| Trichloroethene | mg/l | 0.0243 | 0.000451 | .025 | 95.0 | 44.1-149 | L694007-01 | WG716856 |
| Trichlorofluoromethane | mg/l | 0.0220 | 0.0 | .025 | 88.0 | 49.6-145 | L694007-01 | WG716856 |
| Vinyl chloride | mg/l | 0.0252 | 0.0 | .025 | 100. | 47.8-137 | L694007-01 | WG716856 |
| Xylenes, Total | mg/l | 0.0718 | 0.0 | .075 | 96.0 | 63.3-131 | L694007-01 | WG716856 |
| 4-Bromofluorobenzene | | | | | 92.60 | 71-126 | | WG716856 |
| Dibromofluoromethane | | | | | 100.0 | 78.3-121 | | WG716856 |
| Toluene-d8 | | | | | 99.00 | 88.5-111 | | WG716856 |
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0241 | 0.0 | .025 | 96.0 | 64-128 | L694208-22 | WG717362 |
| 1,1,1-Trichloroethane | mg/l | 0.0268 | 0.0 | .025 | 110. | 58.7-134 | L694208-22 | WG717362 |
| 1,1,2,2-Tetrachloroethane | mg/l | 0.0227 | 0.0 | .025 | 91.0 | 56-132 | L694208-22 | WG717362 |
| 1,1,2-Trichloroethane | mg/l | 0.0240 | 0.0 | .025 | 96.0 | 66.3-125 | L694208-22 | WG717362 |
| 1,1,2-Trichlorotrifluoroethane | mg/l | 0.0302 | 0.0 | .025 | 120. | 54.8-154 | L694208-22 | WG717362 |
| 1,1-Dichloroethane | mg/l | 0.0272 | 0.0 | .025 | 110. | 58.5-132 | L694208-22 | WG717362 |
| 1,1-Dichloroethene | mg/l | 0.0286 | 0.0 | .025 | 110. | 51.1-140 | L694208-22 | WG717362 |
| 1,1-Dichloropropene | mg/l | 0.0279 | 0.0 | .025 | 110. | 57.3-136 | L694208-22 | WG717362 |
| 1,2,3-Trichlorobenzene | mg/l | 0.0232 | 0.0 | .025 | 93.0 | 59.1-138 | L694208-22 | WG717362 |
| 1,2,3-Trichloropropane | mg/l | 0.0239 | 0.0 | .025 | 96.0 | 61.4-128 | L694208-22 | WG717362 |
| 1,2,3-Trimethylbenzene | mg/l | 0.0209 | 0.0 | .025 | 84.0 | 61.3-122 | L694208-22 | WG717362 |
| 1,2,4-Trichlorobenzene | mg/l | 0.0266 | 0.0 | .025 | 110. | 63.6-143 | L694208-22 | WG717362 |
| 1,2,4-Trimethylbenzene | mg/l | 0.0241 | 0.0 | .025 | 96.0 | 57.4-137 | L694208-22 | WG717362 |
| 1,2-Dibromo-3-Chloropropane | mg/l | 0.0221 | 0.0 | .025 | 88.0 | 57.3-136 | L694208-22 | WG717362 |
| 1,2-Dibromoethane | mg/l | 0.0259 | 0.0 | .025 | 100. | 67.1-125 | L694208-22 | WG717362 |
| 1,2-Dichlorobenzene | mg/l | 0.0244 | 0.0 | .025 | 98.0 | 68.2-123 | L694208-22 | WG717362 |
| 1,2-Dichloroethane | mg/l | 0.0253 | 0.0 | .025 | 100. | 60-126 | L694208-22 | WG717362 |
| 1,2-Dichloropropane | mg/l | 0.0253 | 0.0 | .025 | 100. | 64.2-123 | L694208-22 | WG717362 |
| 1,3,5-Trimethylbenzene | mg/l | 0.0255 | 0.0 | .025 | 100. | 63.6-132 | L694208-22 | WG717362 |
| 1,3-Dichlorobenzene | mg/l | 0.0259 | 0.0 | .025 | 100. | 63.1-131 | L694208-22 | WG717362 |
| 1,3-Dichloropropane | mg/l | 0.0249 | 0.0 | .025 | 100. | 67.9-121 | L694208-22 | WG717362 |
| 1,4-Dichlorobenzene | mg/l | 0.0254 | 0.0 | .025 | 100. | 68.6-123 | L694208-22 | WG717362 |
| 2-Chloroethyl vinyl ether | mg/l | 0.0240 | 0.0 | .125 | 19.0 | 10-155 | L694208-22 | WG717362 |
| 2-Chlorotoluene | mg/l | 0.0251 | 0.0 | .025 | 100. | 63.6-128 | L694208-22 | WG717362 |
| 4-Chlorotoluene | mg/l | 0.0265 | 0.0 | .025 | 110. | 65.7-127 | L694208-22 | WG717362 |
| 4-Methyl-2-pentanone (MIBK) | mg/l | 0.124 | 0.0 | .125 | 99.0 | 60.8-140 | L694208-22 | WG717362 |
| Acetone | mg/l | 0.137 | 0.0180 | .125 | 95.0 | 10-130 | L694208-22 | WG717362 |
| Acrolein | mg/l | 0.254 | 0.0 | .125 | 200.* | 10-200 | L694208-22 | WG717362 |
| Acrylonitrile | mg/l | 0.126 | 0.0 | .125 | 100. | 49.4-133 | L694208-22 | WG717362 |
| Benzene | mg/l | 0.0261 | 0.0 | .025 | 100. | 54.3-133 | L694208-22 | WG717362 |
| Bromobenzene | mg/l | 0.0242 | 0.0 | .025 | 97.0 | 63.9-124 | L694208-22 | WG717362 |
| Bromodichloromethane | mg/l | 0.0230 | 0.0 | .025 | 92.0 | 63.9-121 | L694208-22 | WG717362 |
| Bromoform | mg/l | 0.0226 | 0.0 | .025 | 90.0 | 59.5-134 | L694208-22 | WG717362 |
| Bromomethane | mg/l | 0.0334 | 0.0 | .025 | 130. | 41.7-155 | L694208-22 | WG717362 |
| Carbon tetrachloride | mg/l | 0.0270 | 0.0 | .025 | 110. | 55.7-134 | L694208-22 | WG717362 |
| Chlorobenzene | mg/l | 0.0259 | 0.0 | .025 | 100. | 67-125 | L694208-22 | WG717362 |
| Chlorodibromomethane | mg/l | 0.0235 | 0.0 | .025 | 94.0 | 64.3-125 | L694208-22 | WG717362 |
| Chloroethane | mg/l | 0.0311 | 0.0 | .025 | 120. | 51.5-136 | L694208-22 | WG717362 |
| Chloroform | mg/l | 0.0261 | 0.0 | .025 | 100. | 63-129 | L694208-22 | WG717362 |
| Chloromethane | mg/l | 0.0300 | 0.0 | .025 | 120. | 42.4-135 | L694208-22 | WG717362 |

* Performance of this Analyte is outside of established criteria.
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Est. 1970

PES Environmental, Inc.- WA
Kelly Rankich
1215 Fourth Ave., Suite 1350

Seattle, WA 98161

Quality Assurance Report
Level II

April 24, 2014

L694055

| Analyte | Units | Matrix Spike MS Res | Ref Res | TV | % Rec | Limit | Ref Samp | Batch |
|---|---|---|---|---|---|---|---|---|
| cis-1,2-Dichloroethene | mg/l | 0.0256 | 0.0 | .025 | 100. | 59.2-129 | L694208-22 | WG717362 |
| cis-1,3-Dichloropropene | mg/l | 0.0252 | 0.0 | .025 | 100. | 66.4-125 | L694208-22 | WG717362 |
| Di-isopropyl ether | mg/l | 0.0241 | 0.0 | .025 | 96.0 | 56.9-136 | L694208-22 | WG717362 |
| Dibromomethane | mg/l | 0.0262 | 0.0 | .025 | 100. | 68.2-124 | L694208-22 | WG717362 |
| Dichlorodifluoromethane | mg/l | 0.0292 | 0.0 | .025 | 120. | 40.6-144 | L694208-22 | WG717362 |
| Ethylbenzene | mg/l | 0.0266 | 0.0 | .025 | 110. | 61.4-133 | L694208-22 | WG717362 |
| Hexachloro-1,3-butadiene | mg/l | 0.0246 | 0.0 | .025 | 98.0 | 55.1-136 | L694208-22 | WG717362 |
| Isopropylbenzene | mg/l | 0.0280 | 0.0 | .025 | 110. | 66.8-141 | L694208-22 | WG717362 |
| Methyl tert-butyl ether | mg/l | 0.0240 | 0.0 | .025 | 96.0 | 57.7-134 | L694208-22 | WG717362 |
| Methylene Chloride | mg/l | 0.0282 | 0.00120 | .025 | 110. | 58.1-122 | L694208-22 | WG717362 |
| n-Butylbenzene | mg/l | 0.0269 | 0.0 | .025 | 110. | 62.7-140 | L694208-22 | WG717362 |
| n-Propylbenzene | mg/l | 0.0266 | 0.0 | .025 | 110. | 65.9-131 | L694208-22 | WG717362 |
| Naphthalene | mg/l | 0.0227 | 0.0 | .025 | 91.0 | 58-135 | L694208-22 | WG717362 |
| p-Isopropyltoluene | mg/l | 0.0264 | 0.0 | .025 | 110. | 63.2-139 | L694208-22 | WG717362 |
| sec-Butylbenzene | mg/l | 0.0258 | 0.0 | .025 | 100. | 62.2-136 | L694208-22 | WG717362 |
| Styrene | mg/l | 0.0270 | 0.0 | .025 | 110. | 66.8-133 | L694208-22 | WG717362 |
| tert-Butylbenzene | mg/l | 0.0259 | 0.0 | .025 | 100. | 63.3-134 | L694208-22 | WG717362 |
| Tetrachloroethene | mg/l | 0.0278 | 0.0 | .025 | 110. | 53-139 | L694208-22 | WG717362 |
| Toluene | mg/l | 0.0259 | 0.000691 | .025 | 100. | 61.4-130 | L694208-22 | WG717362 |
| trans-1,2-Dichloroethene | mg/l | 0.0270 | 0.0 | .025 | 110. | 56.5-129 | L694208-22 | WG717362 |
| trans-1,3-Dichloropropene | mg/l | 0.0235 | 0.0 | .025 | 94.0 | 64.1-128 | L694208-22 | WG717362 |
| Trichloroethene | mg/l | 0.0273 | 0.0 | .025 | 110. | 44.1-149 | L694208-22 | WG717362 |
| Trichlorofluoromethane | mg/l | 0.0310 | 0.0 | .025 | 120. | 49.6-145 | L694208-22 | WG717362 |
| Vinyl chloride | mg/l | 0.0295 | 0.0 | .025 | 120. | 47.8-137 | L694208-22 | WG717362 |
| Xylenes, Total | mg/l | 0.0772 | 0.0 | .075 | 100. | 63.3-131 | L694208-22 | WG717362 |
| 4-Bromofluorobenzene | | | | | 101.0 | 71-126 | | WG717362 |
| Dibromofluoromethane | | | | | 104.0 | 78.3-121 | | WG717362 |
| Toluene-d8 | | | | | 103.0 | 88.5-111 | | WG717362 |
| 2,2-Dichloropropane | mg/l | 0.0249 | 0.0 | .025 | 100. | 50.5-144 | L694441-01 | WG717315 |
| 2-Butanone (MEK) | mg/l | 0.128 | 0.0 | .125 | 100. | 22.4-138 | L694441-01 | WG717315 |
| 4-Bromofluorobenzene | | | | | 96.80 | 71-126 | | WG717315 |
| Dibromofluoromethane | | | | | 108.0 | 78.3-121 | | WG717315 |
| Toluene-d8 | | | | | 102.0 | 88.5-111 | | WG717315 |

| Analyte | Units | Matrix Spike Duplicate MSD | Ref | %Rec | Limit | RPD | Limit | Ref Samp | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0247 | 0.0242 | 98.7 | 64-128 | 2.14 | 20 | L694093-01 | WG716867 |
| 1,1,1-Trichloroethane | mg/l | 0.0192 | 0.0203 | 76.8 | 58.7-134 | 5.35 | 20 | L694093-01 | WG716867 |
| 1,1,2,2-Tetrachloroethane | mg/l | 0.0245 | 0.0218 | 98.2 | 56-132 | 11.9 | 22.2 | L694093-01 | WG716867 |
| 1,1,2-Trichloroethane | mg/l | 0.0245 | 0.0234 | 97.9 | 66.3-125 | 4.52 | 20 | L694093-01 | WG716867 |
| 1,1,2-Trichlorotrifluoroethane | mg/l | 0.0216 | 0.0233 | 86.4 | 54.8-154 | 7.48 | 22.5 | L694093-01 | WG716867 |
| 1,1-Dichloroethane | mg/l | 0.0195 | 0.0207 | 78.1 | 58.5-132 | 5.90 | 20 | L694093-01 | WG716867 |
| 1,1-Dichloroethene | mg/l | 0.0202 | 0.0212 | 80.6 | 51.1-140 | 5.10 | 20.2 | L694093-01 | WG716867 |
| 1,1-Dichloropropene | mg/l | 0.0197 | 0.0208 | 79.0 | 57.3-136 | 5.12 | 20 | L694093-01 | WG716867 |
| 1,2,3-Trichlorobenzene | mg/l | 0.0265 | 0.0243 | 106. | 59.1-138 | 8.58 | 23.7 | L694093-01 | WG716867 |
| 1,2,3-Trichloropropane | mg/l | 0.0253 | 0.0228 | 101. | 61.4-128 | 10.5 | 22.4 | L694093-01 | WG716867 |
| 1,2,3-Trimethylbenzene | mg/l | 0.0197 | 0.0191 | 78.6 | 61.3-122 | 2.90 | 20 | L694093-01 | WG716867 |
| 1,2,4-Trichlorobenzene | mg/l | 0.0277 | 0.0256 | 111. | 63.6-143 | 7.63 | 21.9 | L694093-01 | WG716867 |
| 1,2,4-Trimethylbenzene | mg/l | 0.0239 | 0.0232 | 95.4 | 57.4-137 | 2.71 | 20 | L694093-01 | WG716867 |
| 1,2-Dibromo-3-Chloropropane | mg/l | 0.0278 | 0.0239 | 111. | 57.3-136 | 15.2 | 27 | L694093-01 | WG716867 |
| 1,2-Dibromoethane | mg/l | 0.0249 | 0.0248 | 99.6 | 67.1-125 | 0.210 | 20 | L694093-01 | WG716867 |
| 1,2-Dichlorobenzene | mg/l | 0.0250 | 0.0235 | 100. | 68.2-123 | 6.39 | 20 | L694093-01 | WG716867 |
| 1,2-Dichloroethane | mg/l | 0.0204 | 0.0210 | 81.7 | 60-126 | 2.49 | 20 | L694093-01 | WG716867 |
| 1,2-Dichloropropane | mg/l | 0.0206 | 0.0216 | 82.3 | 64.2-123 | 4.90 | 20 | L694093-01 | WG716867 |
| 1,3,5-Trimethylbenzene | mg/l | 0.0239 | 0.0236 | 95.4 | 63.6-132 | 1.03 | 20.5 | L694093-01 | WG716867 |
| 1,3-Dichlorobenzene | mg/l | 0.0266 | 0.0255 | 106. | 63.1-131 | 4.21 | 20 | L694093-01 | WG716867 |

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PES Environmental, Inc.- WA
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1215 Fourth Ave., Suite 1350

Seattle, WA 98161

Quality Assurance Report
Level II

L694055

April 24, 2014

| Analyte | Units | Matrix Spike Duplicate MSD | Ref | %Rec | Limit | RPD | Limit | Ref Samp | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,3-Dichloropropane | mg/l | 0.0229 | 0.0231 | 91.7 | 67.9-121 | 0.530 | 20 | L694093-01 | WG716867 |
| 1,4-Dichlorobenzene | mg/l | 0.0250 | 0.0237 | 99.8 | 68.6-123 | 5.11 | 20 | L694093-01 | WG716867 |
| 2,2-Dichloropropane | mg/l | 0.0197 | 0.0205 | 78.8 | 50.5-144 | 4.02 | 21.9 | L694093-01 | WG716867 |
| 2-Chlorotoluene | mg/l | 0.0245 | 0.0244 | 97.9 | 63.6-128 | 0.390 | 20 | L694093-01 | WG716867 |
| 4-Chlorotoluene | mg/l | 0.0236 | 0.0230 | 94.4 | 65.7-127 | 2.52 | 20 | L694093-01 | WG716867 |
| Acetone | mg/l | 0.104 | 0.0979 | 80.8 | 10-130 | 6.36 | 27.9 | L694093-01 | WG716867 |
| Acrolein | mg/l | 0.0959 | 0.0887 | 76.7 | 10-200 | 7.83 | 27.7 | L694093-01 | WG716867 |
| Acrylonitrile | mg/l | 0.0995 | 0.0959 | 79.6 | 49.4-133 | 3.77 | 25.3 | L694093-01 | WG716867 |
| Benzene | mg/l | 0.0192 | 0.0200 | 76.9 | 54.3-133 | 3.73 | 20 | L694093-01 | WG716867 |
| Bromobenzene | mg/l | 0.0244 | 0.0234 | 97.4 | 63.9-124 | 4.00 | 20 | L694093-01 | WG716867 |
| Bromodichloromethane | mg/l | 0.0247 | 0.0244 | 78.4 | 63.9-121 | 0.930 | 20 | L694093-01 | WG716867 |
| Bromoform | mg/l | 0.0283 | 0.0257 | 113. | 59.5-134 | 9.41 | 20.5 | L694093-01 | WG716867 |
| Bromomethane | mg/l | 0.0225 | 0.0243 | 90.2 | 41.7-155 | 7.38 | 21.9 | L694093-01 | WG716867 |
| Carbon tetrachloride | mg/l | 0.0206 | 0.0221 | 82.3 | 55.7-134 | 7.26 | 20 | L694093-01 | WG716867 |
| Chlorobenzene | mg/l | 0.0246 | 0.0248 | 98.5 | 67-125 | 0.820 | 20 | L694093-01 | WG716867 |
| Chlorodibromomethane | mg/l | 0.0266 | 0.0255 | 102. | 64.3-125 | 4.08 | 20.8 | L694093-01 | WG716867 |
| Chloroform | mg/l | 0.0451 | 0.0428 | 60.2* | 63-129 | 5.29 | 20 | L694093-01 | WG716867 |
| Chloromethane | mg/l | 0.0199 | 0.0208 | 79.8 | 42.4-135 | 4.15 | 20 | L694093-01 | WG716867 |
| cis-1,2-Dichloroethene | mg/l | 0.0195 | 0.0208 | 78.0 | 59.2-129 | 6.40 | 20 | L694093-01 | WG716867 |
| cis-1,3-Dichloropropene | mg/l | 0.0212 | 0.0215 | 84.9 | 66.4-125 | 1.42 | 20 | L694093-01 | WG716867 |
| Dibromomethane | mg/l | 0.0218 | 0.0224 | 87.3 | 68.2-124 | 2.39 | 20 | L694093-01 | WG716867 |
| Dichlorodifluoromethane | mg/l | 0.0249 | 0.0264 | 99.7 | 40.6-144 | 5.83 | 20.2 | L694093-01 | WG716867 |
| Ethylbenzene | mg/l | 0.0243 | 0.0247 | 97.1 | 61.4-133 | 1.71 | 20 | L694093-01 | WG716867 |
| Hexachloro-1,3-butadiene | mg/l | 0.0245 | 0.0229 | 97.9 | 55.1-136 | 6.45 | 23.6 | L694093-01 | WG716867 |
| Isopropylbenzene | mg/l | 0.0264 | 0.0262 | 106. | 66.8-141 | 0.630 | 20 | L694093-01 | WG716867 |
| Methyl tert-butyl ether | mg/l | 0.0195 | 0.0199 | 77.9 | 57.7-134 | 1.99 | 20 | L694093-01 | WG716867 |
| Methylene Chloride | mg/l | 0.0190 | 0.0202 | 75.9 | 58.1-122 | 6.40 | 20 | L694093-01 | WG716867 |
| n-Butylbenzene | mg/l | 0.0229 | 0.0221 | 91.5 | 62.7-140 | 3.27 | 20.3 | L694093-01 | WG716867 |
| n-Propylbenzene | mg/l | 0.0242 | 0.0239 | 96.6 | 65.9-131 | 1.16 | 20 | L694093-01 | WG716867 |
| Naphthalene | mg/l | 0.0260 | 0.0230 | 104. | 58-135 | 12.1 | 25.5 | L694093-01 | WG716867 |
| p-Isopropyltoluene | mg/l | 0.0258 | 0.0249 | 103. | 63.2-139 | 3.55 | 20.4 | L694093-01 | WG716867 |
| sec-Butylbenzene | mg/l | 0.0250 | 0.0242 | 100. | 62.2-136 | 3.02 | 20.3 | L694093-01 | WG716867 |
| Styrene | mg/l | 0.0186 | 0.0208 | 74.2 | 66.8-133 | 11.4 | 20 | L694093-01 | WG716867 |
| tert-Butylbenzene | mg/l | 0.0255 | 0.0247 | 102. | 63.3-134 | 3.31 | 21 | L694093-01 | WG716867 |
| Tetrachloroethene | mg/l | 0.0253 | 0.0267 | 101. | 53-139 | 5.29 | 20 | L694093-01 | WG716867 |
| Toluene | mg/l | 0.0205 | 0.0215 | 82.1 | 61.4-130 | 4.74 | 20 | L694093-01 | WG716867 |
| trans-1,2-Dichloroethene | mg/l | 0.0185 | 0.0197 | 73.9 | 56.5-129 | 6.66 | 20 | L694093-01 | WG716867 |
| Trichloroethene | mg/l | 0.0219 | 0.0233 | 87.8 | 44.1-149 | 5.86 | 20 | L694093-01 | WG716867 |
| Trichlorofluoromethane | mg/l | 0.0242 | 0.0257 | 96.7 | 49.6-145 | 6.11 | 21.2 | L694093-01 | WG716867 |
| Vinyl chloride | mg/l | 0.0206 | 0.0223 | 82.5 | 47.8-137 | 7.74 | 20 | L694093-01 | WG716867 |
| Xylenes, Total | mg/l | 0.0728 | 0.0739 | 97.0 | 63.3-131 | 1.45 | 20 | L694093-01 | WG716867 |
| 4-Bromofluorobenzene | | | | 105.0 | 71-126 | | | | WG716867 |
| Dibromofluoromethane | | | | 97.20 | 78.3-121 | | | | WG716867 |
| Toluene-d8 | | | | 103.0 | 88.5-111 | | | | WG716867 |
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0228 | 0.0235 | 91.3 | 64-128 | 2.91 | 20 | L694007-01 | WG716856 |
| 1,1,1-Trichloroethane | mg/l | 0.0258 | 0.0264 | 103. | 58.7-134 | 2.27 | 20 | L694007-01 | WG716856 |
| 1,1,2,2-Tetrachloroethane | mg/l | 0.0275 | 0.0271 | 110. | 56-132 | 1.42 | 22.2 | L694007-01 | WG716856 |
| 1,1,2-Trichloroethane | mg/l | 0.0270 | 0.0257 | 108. | 66.3-125 | 5.03 | 20 | L694007-01 | WG716856 |
| 1,1,2-Trichlorotrifluoroethane | mg/l | 0.0238 | 0.0239 | 95.1 | 54.8-154 | 0.370 | 22.5 | L694007-01 | WG716856 |
| 1,1-Dichloroethane | mg/l | 0.0271 | 0.0284 | 108. | 58.5-132 | 4.58 | 20 | L694007-01 | WG716856 |
| 1,1-Dichloroethene | mg/l | 0.0222 | 0.0230 | 89.0 | 51.1-140 | 3.23 | 20.2 | L694007-01 | WG716856 |
| 1,1-Dichloropropene | mg/l | 0.0258 | 0.0266 | 103. | 57.3-136 | 3.17 | 20 | L694007-01 | WG716856 |
| 1,2,3-Trichlorobenzene | mg/l | 0.0274 | 0.0271 | 110. | 59.1-138 | 1.26 | 23.7 | L694007-01 | WG716856 |
| 1,2,3-Trichloropropane | mg/l | 0.0255 | 0.0246 | 102. | 61.4-128 | 3.32 | 22.4 | L694007-01 | WG716856 |
| 1,2,3-Trimethylbenzene | mg/l | 0.0213 | 0.0214 | 85.1 | 61.3-122 | 0.660 | 20 | L694007-01 | WG716856 |
| 1,2,4-Trichlorobenzene | mg/l | 0.0276 | 0.0274 | 110. | 63.6-143 | 0.820 | 21.9 | L694007-01 | WG716856 |
| 1,2,4-Trimethylbenzene | mg/l | 0.0232 | 0.0236 | 93.0 | 57.4-137 | 1.64 | 20 | L694007-01 | WG716856 |

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Seattle, WA 98161

Quality Assurance Report
Level II

L694055

April 24, 2014

| Analyte | Units | Matrix Spike MSD | Duplicate Ref | %Rec | Limit | RPD | Limit | Ref Samp | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dibromo-3-Chloropropane | mg/l | 0.0314 | 0.0291 | 126. | 57.3-136 | 7.65 | 27 | L694007-01 | WG716856 |
| 1,2-Dibromoethane | mg/l | 0.0273 | 0.0265 | 109. | 67.1-125 | 2.97 | 20 | L694007-01 | WG716856 |
| 1,2-Dichlorobenzene | mg/l | 0.0248 | 0.0248 | 99.1 | 68.2-123 | 0.0200 | 20 | L694007-01 | WG716856 |
| 1,2-Dichloroethane | mg/l | 0.0253 | 0.0255 | 101. | 60-126 | 0.920 | 20 | L694007-01 | WG716856 |
| 1,2-Dichloropropane | mg/l | 0.0260 | 0.0265 | 104. | 64.2-123 | 1.87 | 20 | L694007-01 | WG716856 |
| 1,3,5-Trimethylbenzene | mg/l | 0.0233 | 0.0237 | 93.2 | 63.6-132 | 1.79 | 20.5 | L694007-01 | WG716856 |
| 1,3-Dichlorobenzene | mg/l | 0.0229 | 0.0231 | 91.6 | 63.1-131 | 0.800 | 20 | L694007-01 | WG716856 |
| 1,3-Dichloropropane | mg/l | 0.0253 | 0.0251 | 101. | 67.9-121 | 1.03 | 20 | L694007-01 | WG716856 |
| 1,4-Dichlorobenzene | mg/l | 0.0231 | 0.0228 | 92.5 | 68.6-123 | 1.50 | 20 | L694007-01 | WG716856 |
| 2,2-Dichloropropane | mg/l | 0.0243 | 0.0253 | 97.0 | 50.5-144 | 4.25 | 21.9 | L694007-01 | WG716856 |
| 2-Butanone (MEK) | mg/l | 0.180 | 0.178 | 144.* | 22.4-138 | 1.17 | 27 | L694007-01 | WG716856 |
| 2-Chloroethyl vinyl ether | mg/l | 0.00101 | 0.00399 | 0.809* | 10-155 | 119.* | 20 | L694007-01 | WG716856 |
| 2-Chlorotoluene | mg/l | 0.0225 | 0.0231 | 90.1 | 63.6-128 | 2.34 | 20 | L694007-01 | WG716856 |
| 4-Chlorotoluene | mg/l | 0.0235 | 0.0238 | 93.8 | 65.7-127 | 1.42 | 20 | L694007-01 | WG716856 |
| 4-Methyl-2-pentanone (MIBK) | mg/l | 0.172 | 0.166 | 138. | 60.8-140 | 3.43 | 25.1 | L694007-01 | WG716856 |
| Acetone | mg/l | 0.171 | 0.170 | 136.* | 10-130 | 0.770 | 27.9 | L694007-01 | WG716856 |
| Acrolein | mg/l | 0.208 | 0.207 | 166. | 10-200 | 0.300 | 27.7 | L694007-01 | WG716856 |
| Acrylonitrile | mg/l | 0.179 | 0.177 | 143.* | 49.4-133 | 1.05 | 25.3 | L694007-01 | WG716856 |
| Benzene | mg/l | 0.0264 | 0.0269 | 106. | 54.3-133 | 1.95 | 20 | L694007-01 | WG716856 |
| Bromobenzene | mg/l | 0.0233 | 0.0235 | 93.3 | 63.9-124 | 0.610 | 20 | L694007-01 | WG716856 |
| Bromodichloromethane | mg/l | 0.0246 | 0.0243 | 98.5 | 63.9-121 | 1.48 | 20 | L694007-01 | WG716856 |
| Bromoform | mg/l | 0.0229 | 0.0227 | 91.7 | 59.5-134 | 1.21 | 20.5 | L694007-01 | WG716856 |
| Bromomethane | mg/l | 0.0246 | 0.0241 | 98.6 | 41.7-155 | 2.29 | 21.9 | L694007-01 | WG716856 |
| Carbon tetrachloride | mg/l | 0.0262 | 0.0263 | 105. | 55.7-134 | 0.170 | 20 | L694007-01 | WG716856 |
| Chlorobenzene | mg/l | 0.0230 | 0.0235 | 92.0 | 67-125 | 2.19 | 20 | L694007-01 | WG716856 |
| Chlorodibromomethane | mg/l | 0.0256 | 0.0255 | 102. | 64.3-125 | 0.190 | 20.8 | L694007-01 | WG716856 |
| Chloroethane | mg/l | 0.0212 | 0.0209 | 84.8 | 51.5-136 | 1.36 | 40 | L694007-01 | WG716856 |
| Chloroform | mg/l | 0.0260 | 0.0264 | 104. | 63-129 | 1.66 | 20 | L694007-01 | WG716856 |
| Chloromethane | mg/l | 0.0315 | 0.0322 | 126. | 42.4-135 | 2.12 | 20 | L694007-01 | WG716856 |
| cis-1,2-Dichloroethene | mg/l | 0.0265 | 0.0280 | 106. | 59.2-129 | 5.22 | 20 | L694007-01 | WG716856 |
| cis-1,3-Dichloropropene | mg/l | 0.0275 | 0.0269 | 110. | 66.4-125 | 2.07 | 20 | L694007-01 | WG716856 |
| Di-isopropyl ether | mg/l | 0.0290 | 0.0294 | 116. | 56.9-136 | 1.31 | 20 | L694007-01 | WG716856 |
| Dibromomethane | mg/l | 0.0288 | 0.0282 | 115. | 68.2-124 | 2.00 | 20 | L694007-01 | WG716856 |
| Dichlorodifluoromethane | mg/l | 0.0252 | 0.0263 | 101. | 40.6-144 | 4.21 | 20.2 | L694007-01 | WG716856 |
| Ethylbenzene | mg/l | 0.0238 | 0.0239 | 95.4 | 61.4-133 | 0.340 | 20 | L694007-01 | WG716856 |
| Hexachloro-1,3-butadiene | mg/l | 0.0234 | 0.0235 | 93.8 | 55.1-136 | 0.0500 | 23.6 | L694007-01 | WG716856 |
| Isopropylbenzene | mg/l | 0.0259 | 0.0266 | 104. | 66.8-141 | 2.56 | 20 | L694007-01 | WG716856 |
| Methyl tert-butyl ether | mg/l | 0.0295 | 0.0297 | 118. | 57.7-134 | 0.700 | 20 | L694007-01 | WG716856 |
| Methylene Chloride | mg/l | 0.0266 | 0.0272 | 105. | 58.1-122 | 2.32 | 20 | L694007-01 | WG716856 |
| n-Butylbenzene | mg/l | 0.0262 | 0.0259 | 105. | 62.7-140 | 1.03 | 20.3 | L694007-01 | WG716856 |
| n-Propylbenzene | mg/l | 0.0240 | 0.0243 | 96.0 | 65.9-131 | 1.25 | 20 | L694007-01 | WG716856 |
| Naphthalene | mg/l | 0.0307 | 0.0293 | 123. | 58-135 | 4.50 | 25.5 | L694007-01 | WG716856 |
| p-Isopropyltoluene | mg/l | 0.0239 | 0.0243 | 95.6 | 63.2-139 | 1.74 | 20.4 | L694007-01 | WG716856 |
| sec-Butylbenzene | mg/l | 0.0239 | 0.0241 | 95.6 | 62.2-136 | 0.890 | 20.3 | L694007-01 | WG716856 |
| Styrene | mg/l | 0.0254 | 0.0257 | 101. | 66.8-133 | 1.52 | 20 | L694007-01 | WG716856 |
| tert-Butylbenzene | mg/l | 0.0240 | 0.0238 | 96.1 | 63.3-134 | 1.11 | 21 | L694007-01 | WG716856 |
| Tetrachloroethene | mg/l | 0.0245 | 0.0255 | 84.3 | 53-139 | 4.11 | 20 | L694007-01 | WG716856 |
| Toluene | mg/l | 0.0259 | 0.0256 | 104. | 61.4-130 | 1.16 | 20 | L694007-01 | WG716856 |
| trans-1,2-Dichloroethene | mg/l | 0.0263 | 0.0265 | 105. | 56.5-129 | 0.850 | 20 | L694007-01 | WG716856 |
| trans-1,3-Dichloropropene | mg/l | 0.0252 | 0.0259 | 101. | 64.1-128 | 2.75 | 20 | L694007-01 | WG716856 |
| Trichloroethene | mg/l | 0.0248 | 0.0243 | 97.3 | 44.1-149 | 2.08 | 20 | L694007-01 | WG716856 |
| Trichlorofluoromethane | mg/l | 0.0212 | 0.0220 | 84.9 | 49.6-145 | 3.64 | 21.2 | L694007-01 | WG716856 |
| Vinyl chloride | mg/l | 0.0245 | 0.0252 | 98.1 | 47.8-137 | 2.55 | 20 | L694007-01 | WG716856 |
| Xylenes, Total | mg/l | 0.0707 | 0.0718 | 94.3 | 63.3-131 | 1.47 | 20 | L694007-01 | WG716856 |
| 4-Bromofluorobenzene | | | | 93.70 | 71-126 | | | | WG716856 |
| Dibromofluoromethane | | | | 98.80 | 78.3-121 | | | | WG716856 |
| Toluene-d8 | | | | 100.0 | 88.5-111 | | | | WG716856 |

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Est. 1970

PES Environmental, Inc.- WA
Kelly Rankich
1215 Fourth Ave., Suite 1350

Seattle, WA 98161

Quality Assurance Report
Level II

L694055

April 24, 2014

| Analyte | Units | Matrix Spike MSD | Duplicate Ref | %Rec | Limit | RPD | Limit | Ref Samp | Batch |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | mg/l | 0.0248 | 0.0241 | 99.2 | 64-128 | 2.79 | 20 | L694208-22 | WG717362 |
| 1,1,1-Trichloroethane | mg/l | 0.0270 | 0.0268 | 108. | 58.7-134 | 0.770 | 20 | L694208-22 | WG717362 |
| 1,1,2,2-Tetrachloroethane | mg/l | 0.0242 | 0.0227 | 96.7 | 56-132 | 6.11 | 22.2 | L694208-22 | WG717362 |
| 1,1,2-Trichloroethane | mg/l | 0.0247 | 0.0240 | 98.6 | 66.3-125 | 2.57 | 20 | L694208-22 | WG717362 |
| 1,1,2-Trichlorotrifluoroethane | mg/l | 0.0301 | 0.0302 | 120. | 54.8-154 | 0.350 | 22.5 | L694208-22 | WG717362 |
| 1,1-Dichloroethane | mg/l | 0.0283 | 0.0272 | 113. | 58.5-132 | 3.89 | 20 | L694208-22 | WG717362 |
| 1,1-Dichloroethene | mg/l | 0.0288 | 0.0286 | 115. | 51.1-140 | 0.900 | 20.2 | L694208-22 | WG717362 |
| 1,1-Dichloropropene | mg/l | 0.0288 | 0.0279 | 115. | 57.3-136 | 3.06 | 20 | L694208-22 | WG717362 |
| 1,2,3-Trichlorobenzene | mg/l | 0.0253 | 0.0232 | 101. | 59.1-138 | 8.56 | 23.7 | L694208-22 | WG717362 |
| 1,2,3-Trichloropropane | mg/l | 0.0258 | 0.0239 | 103. | 61.4-128 | 7.61 | 22.4 | L694208-22 | WG717362 |
| 1,2,3-Trimethylbenzene | mg/l | 0.0215 | 0.0209 | 85.8 | 61.3-122 | 2.58 | 20 | L694208-22 | WG717362 |
| 1,2,4-Trichlorobenzene | mg/l | 0.0270 | 0.0266 | 108. | 63.6-143 | 1.39 | 21.9 | L694208-22 | WG717362 |
| 1,2,4-Trimethylbenzene | mg/l | 0.0246 | 0.0241 | 98.6 | 57.4-137 | 2.10 | 20 | L694208-22 | WG717362 |
| 1,2-Dibromo-3-Chloropropane | mg/l | 0.0237 | 0.0221 | 94.8 | 57.3-136 | 6.96 | 27 | L694208-22 | WG717362 |
| 1,2-Dibromoethane | mg/l | 0.0277 | 0.0259 | 111. | 67.1-125 | 6.83 | 20 | L694208-22 | WG717362 |
| 1,2-Dichlorobenzene | mg/l | 0.0249 | 0.0244 | 99.7 | 68.2-123 | 2.18 | 20 | L694208-22 | WG717362 |
| 1,2-Dichloroethane | mg/l | 0.0266 | 0.0253 | 106. | 60-126 | 5.34 | 20 | L694208-22 | WG717362 |
| 1,2-Dichloropropane | mg/l | 0.0258 | 0.0253 | 103. | 64.2-123 | 2.20 | 20 | L694208-22 | WG717362 |
| 1,3,5-Trimethylbenzene | mg/l | 0.0260 | 0.0255 | 104. | 63.6-132 | 2.02 | 20.5 | L694208-22 | WG717362 |
| 1,3-Dichlorobenzene | mg/l | 0.0268 | 0.0259 | 107. | 63.1-131 | 3.61 | 20 | L694208-22 | WG717362 |
| 1,3-Dichloropropane | mg/l | 0.0260 | 0.0249 | 104. | 67.9-121 | 4.44 | 20 | L694208-22 | WG717362 |
| 1,4-Dichlorobenzene | mg/l | 0.0255 | 0.0254 | 102. | 68.6-123 | 0.360 | 20 | L694208-22 | WG717362 |
| 2-Chloroethyl vinyl ether | mg/l | 0.00520 | 0.0240 | 4.16* | 10-155 | 129.* | 20 | L694208-22 | WG717362 |
| 2-Chlorotoluene | mg/l | 0.0259 | 0.0251 | 104. | 63.6-128 | 3.09 | 20 | L694208-22 | WG717362 |
| 4-Chlorotoluene | mg/l | 0.0266 | 0.0265 | 106. | 65.7-127 | 0.600 | 20 | L694208-22 | WG717362 |
| 4-Methyl-2-pentanone (MIBK) | mg/l | 0.133 | 0.124 | 106. | 60.8-140 | 7.30 | 25.1 | L694208-22 | WG717362 |
| Acetone | mg/l | 0.152 | 0.137 | 107. | 10-130 | 10.1 | 27.9 | L694208-22 | WG717362 |
| Acrolein | mg/l | 0.265 | 0.254 | 212.* | 10-200 | 4.02 | 27.7 | L694208-22 | WG717362 |
| Acrylonitrile | mg/l | 0.140 | 0.126 | 112. | 49.4-133 | 10.4 | 25.3 | L694208-22 | WG717362 |
| Benzene | mg/l | 0.0269 | 0.0261 | 107. | 54.3-133 | 2.74 | 20 | L694208-22 | WG717362 |
| Bromobenzene | mg/l | 0.0248 | 0.0242 | 99.1 | 63.9-124 | 2.41 | 20 | L694208-22 | WG717362 |
| Bromodichloromethane | mg/l | 0.0236 | 0.0230 | 94.3 | 63.9-121 | 2.32 | 20 | L694208-22 | WG717362 |
| Bromoform | mg/l | 0.0240 | 0.0226 | 96.0 | 59.5-134 | 6.22 | 20.5 | L694208-22 | WG717362 |
| Bromomethane | mg/l | 0.0330 | 0.0334 | 132. | 41.7-155 | 1.34 | 21.9 | L694208-22 | WG717362 |
| Carbon tetrachloride | mg/l | 0.0275 | 0.0270 | 110. | 55.7-134 | 1.81 | 20 | L694208-22 | WG717362 |
| Chlorobenzene | mg/l | 0.0265 | 0.0259 | 106. | 67-125 | 2.54 | 20 | L694208-22 | WG717362 |
| Chlorodibromomethane | mg/l | 0.0247 | 0.0235 | 98.6 | 64.3-125 | 4.77 | 20.8 | L694208-22 | WG717362 |
| Chloroethane | mg/l | 0.0322 | 0.0311 | 129. | 51.5-136 | 3.65 | 40 | L694208-22 | WG717362 |
| Chloroform | mg/l | 0.0273 | 0.0261 | 109. | 63-129 | 4.31 | 20 | L694208-22 | WG717362 |
| Chloromethane | mg/l | 0.0311 | 0.0300 | 124. | 42.4-135 | 3.91 | 20 | L694208-22 | WG717362 |
| cis-1,2-Dichloroethene | mg/l | 0.0270 | 0.0256 | 108. | 59.2-129 | 5.64 | 20 | L694208-22 | WG717362 |
| cis-1,3-Dichloropropene | mg/l | 0.0256 | 0.0252 | 102. | 66.4-125 | 1.69 | 20 | L694208-22 | WG717362 |
| Di-isopropyl ether | mg/l | 0.0248 | 0.0241 | 99.3 | 56.9-136 | 3.13 | 20 | L694208-22 | WG717362 |
| Dibromomethane | mg/l | 0.0274 | 0.0262 | 110. | 68.2-124 | 4.37 | 20 | L694208-22 | WG717362 |
| Dichlorodifluoromethane | mg/l | 0.0288 | 0.0292 | 115. | 40.6-144 | 1.31 | 20.2 | L694208-22 | WG717362 |
| Ethylbenzene | mg/l | 0.0270 | 0.0266 | 108. | 61.4-133 | 1.32 | 20 | L694208-22 | WG717362 |
| Hexachloro-1,3-butadiene | mg/l | 0.0241 | 0.0246 | 96.3 | 55.1-136 | 2.08 | 23.6 | L694208-22 | WG717362 |
| Isopropylbenzene | mg/l | 0.0286 | 0.0280 | 114. | 66.8-141 | 2.10 | 20 | L694208-22 | WG717362 |
| Methyl tert-butyl ether | mg/l | 0.0251 | 0.0240 | 100. | 57.7-134 | 4.52 | 20 | L694208-22 | WG717362 |
| Methylene Chloride | mg/l | 0.0285 | 0.0282 | 109. | 58.1-122 | 1.07 | 20 | L694208-22 | WG717362 |
| n-Butylbenzene | mg/l | 0.0274 | 0.0269 | 110. | 62.7-140 | 1.75 | 20.3 | L694208-22 | WG717362 |
| n-Propylbenzene | mg/l | 0.0268 | 0.0266 | 107. | 65.9-131 | 0.720 | 20 | L694208-22 | WG717362 |
| Naphthalene | mg/l | 0.0252 | 0.0227 | 101. | 58-135 | 10.1 | 25.5 | L694208-22 | WG717362 |
| p-Isopropyltoluene | mg/l | 0.0266 | 0.0264 | 106. | 63.2-139 | 0.770 | 20.4 | L694208-22 | WG717362 |
| sec-Butylbenzene | mg/l | 0.0262 | 0.0258 | 105. | 62.2-136 | 1.85 | 20.3 | L694208-22 | WG717362 |
| Styrene | mg/l | 0.0277 | 0.0270 | 111. | 66.8-133 | 2.70 | 20 | L694208-22 | WG717362 |
| tert-Butylbenzene | mg/l | 0.0262 | 0.0259 | 105. | 63.3-134 | 1.49 | 21 | L694208-22 | WG717362 |
| Tetrachloroethene | mg/l | 0.0267 | 0.0278 | 107. | 53-139 | 4.22 | 20 | L694208-22 | WG717362 |
| Toluene | mg/l | 0.0264 | 0.0259 | 103. | 61.4-130 | 1.69 | 20 | L694208-22 | WG717362 |

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For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Est. 1970

PES Environmental, Inc.- WA
Kelly Rankich
1215 Fourth Ave., Suite 1350
Seattle, WA 98161

Quality Assurance Report
Level II

L694055

April 24, 2014

| Analyte | Units | Matrix Spike MSD | Duplicate Ref | %Rec | Limit | RPD | Limit | Ref Samp | Batch |
|---|---|---|---|---|---|---|---|---|---|
| trans-1,2-Dichloroethene | mg/l | 0.0277 | 0.0270 | 111. | 56.5-129 | 2.48 | 20 | L694208-22 | WG717362 |
| trans-1,3-Dichloropropene | mg/l | 0.0244 | 0.0235 | 97.5 | 64.1-128 | 3.61 | 20 | L694208-22 | WG717362 |
| Trichloroethene | mg/l | 0.0274 | 0.0273 | 109. | 44.1-149 | 0.290 | 20 | L694208-22 | WG717362 |
| Trichlorofluoromethane | mg/l | 0.0308 | 0.0310 | 123. | 49.6-145 | 0.540 | 21.2 | L694208-22 | WG717362 |
| Vinyl chloride | mg/l | 0.0295 | 0.0295 | 118. | 47.8-137 | 0.170 | 20 | L694208-22 | WG717362 |
| Xylenes, Total | mg/l | 0.0785 | 0.0772 | 105. | 63.3-131 | 1.67 | 20 | L694208-22 | WG717362 |
| 4-Bromofluorobenzene | | | | 102.0 | 71-126 | | | | WG717362 |
| Dibromofluoromethane | | | | 106.0 | 78.3-121 | | | | WG717362 |
| Toluene-d8 | | | | 103.0 | 88.5-111 | | | | WG717362 |
| 2,2-Dichloropropane | mg/l | 0.0249 | 0.0249 | 99.7 | 50.5-144 | 0.120 | 21.9 | L694441-01 | WG717315 |
| 2-Butanone (MEK) | mg/l | 0.117 | 0.128 | 93.5 | 22.4-138 | 8.92 | 27 | L694441-01 | WG717315 |
| 4-Bromofluorobenzene | | | | 96.20 | 71-126 | | | | WG717315 |
| Dibromofluoromethane | | | | 107.0 | 78.3-121 | | | | WG717315 |
| Toluene-d8 | | | | 102.0 | 88.5-111 | | | | WG717315 |

Batch number /Run number / Sample number cross reference

WG716867: R2906906: L694055-09 10
WG716856: R2907105: L694055-01 02 03 04 05 06 07 08
WG717362: R2907692: L694055-09 10 11
WG717315: R2908746: L694055-09 10 11

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Est. 1970

PES Environmental, Inc.- WA
Kelly Rankich
1215 Fourth Ave., Suite 1350

Seattle, WA 98161

Quality Assurance Report
Level II

L694055

April 24, 2014

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

| | | |
|---|---|---|
| **PES Environmental, Inc.- WA**<br>1215 Fourth Ave., Suite 1350<br>Seattle, WA 98161 | Billing Information:<br>Attn: Accounts Payable<br>1215 Fourth Ave., Ste. 1350<br>Seattle, WA 98161 | Analysis / Container / Preservative |
| Report to: Kelly Rankich | Email To: krankich@pesenv.com | |
| Project Description: Manhattan Village | City/State Collected: Normandy Park, WA | |
| Phone: 206-529-3980<br>Fax: 206-529-3985 | Client Project #: MVSC | Lab Project #: PESENVSWA-MVSC |
| Collected by (print): Karsten Grunstad | Site/Facility ID #: 1358.001.01.003 | P.O. #: 1358.001.01.003 |
| Collected by (signature): Immediately Packed on Ice N ___ Y X | *Rush?* (Lab MUST Be Notified)<br>___ Same Day .....200%<br>___ Next Day .....100%<br>___ Two Day .....50%<br>___ Three Day .....25% | Date Results Needed<br>Email? ___No X_Yes<br>FAX? ___No ___Yes |

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Cntrs | V8260 40mlAmb-HCl | V8260- Trip Blank 40mlAmb-HCl-Blk | Rem./Contaminant | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-15- 04/14/14 | Grab | GW | 48 | 4-14-14 | 1200 | 3 | X | | | -01 |
| MW-2- 04/14/14 | Grab | GW | 40 | 4-14-14 | 1330 | 3 | X | | | -02 |
| DC-13- 04/14/14 | Grab | GW | 41 | 4-14-14 | 1500 | 3 | X | | | -03 |
| DC-12- 04/15/14 | Grab | GW | 41 | 4-15-14 | 1030 | 3 | X | | | -04 |
| DC-20- 04/14/14 | Grab | GW | 47 | 4-14-14 | 1600 | 3 | X | | | -05 |
| KMW-9- 04/15/14 | Grab | GW | 41 | 4-15-14 | 1145 | 3 | X | | | -06 |
| DC-11- 04/15/14 | Grab | GW | 41 | 4-15-14 | 1230 | 3 | X | | | -07 |
| DC-15- 04/15/14 | Grab | GW | 39 | 4-15-14 | 1330 | 3 | X | | | -08 |
| EQ-1- 04/14/14 | Grab | GW | — | 4-14-14 | 1630 | 3 | X | | | -09 |
| EQ-2- 04/15/14 | Grab | GW | — | 4-15-14 | 1400 | 3 | X | | | -10 |

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

**Remarks:**

pH _____ Temp _____

Flow _____ Other _____

Chain of Custody Page 1 of 2

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 694055

A010

Acctnum: PESENVSWA
Template: T93252
Prelogin: P464964
TSR: 358 - Jarred Willis
PB: 4-7 KW
Shipped Via: FedEX Ground

| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| | 4-15-14 | 1430 | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) |
| | | | |
| Relinquished by : (Signature) | Date: | Time: | Received for lab by: (Signature) |
| | | | |

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 3.4 °C Bottles Received: 31=VP

Date: 4-16-14 Time: 1000

Hold #

Condition: 5 (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

**PES Environmental, Inc.- WA**

1215 Fourth Ave., Suite 1350
Seattle, WA 98161

Billing Information:

Attn: Accounts Payable
1215 Fourth Ave., Ste. 1350
Seattle, WA 98161

Report to: Kelly Rankich

Email To: krankich@pesenv.com

Project Description: Manhattan Village

City/State Collected: Normandy Park WA

Phone: 206-529-3980
Fax: 206-529-3985

Client Project # MVSC

Lab Project # PESENVSWA-MVSC

Collected by (print): Karsten Springstead

Site/Facility ID # 1358.001.01.003

P.O. # 1358.001.01.003

Collected by (signature):

Immediately Packed on Ice N ___ Y X

*Rush?* (Lab MUST Be Notified)
___ Same Day .....200%
___ Next Day .....100%
___ Two Day .....50%
___ Three Day .....25%

Date Results Needed

Email? ___No X_Yes
FAX? ___No ___Yes

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Cntrs | V8260 40mlAmb-HCl | V8260- Trip Blank 40mlAmb-HCl-Blk | Rem./Contaminant | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|
| TRIPBLANK-1 | — | GW | — | — | — | 1 | | X | | -1 |
| ~~TRIPBLANK-2~~ | | ~~GW~~ | | | | ~~1~~ | | ~~X~~ | | |
| | | ~~GW~~ | | | | ~~3~~ | ~~X~~ | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

ESC LABORATORIES
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L# 694055

Table #

Acctnum: PESENVSWA
Template: T93252
Prelogin: P464964
TSR: 358 - Jarred Willis
PB: 4-7 KW

Shipped Via: FedEX Ground

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Hold #

| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| | 4-15-14 | 1430 | |
| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
| | | | |
| Relinquished by : (Signature) | Date: | Time: | Received for lab by: (Signature) |
| | | | Alone |

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 3.7 °C Bottles Received: 3=VP

Date: 4-16-14 Time: 1000

Condition: J-S (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

# MEMORANDUM

**TO:** Project File **DATE:** May 2, 2014

**FROM:** Jerry Harris

**SUBJECT:** Laboratory Data Validation Review

**PROJECT:** MVSC

**PROJECT #:** 1358.001.01.003

**TASK:** April 14, 2014 Water Samples

**LAB:** ESC Analytical Service Request No. 694055

---

Groundwater sampling at the MVSC site was conducted on April 14 and 15, 2014. Ten water samples were collected. In addition, a laboratory-prepared trip blank traveled with the sample containers from the laboratory to the field and back to the laboratory with the collected samples.

The water samples were analyzed for volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Method 8260B. Four USEPA 8260B analysis lots (lot IDs WG716856, WG716867, WG717362 and WG717315) were analyzed on April 20, 21, 22 and 23, respectively). Laboratory analytical services were provided by ESC Lab Sciences (ESC) of Mt. Juliet, TN. FA Project number: 694055.

The quality assurance review of the laboratory data is summarized below.

## DATA QUALIFICATIONS

Guidelines established by USEPA for review of analytical data were used to validate the data. The comments presented in this memorandum refer to the laboratory's performance in meeting the quality control criteria outlined in the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA, 1999).

## DATA VALIDATION

### Completeness

All samples were collected and analyzed as requested. Data completeness is 100%.

### Sample Collection and Preservation

Samples were collected in appropriately preserved containers supplied by the analytical laboratory. The samples were received in good condition by the laboratory. The laboratory received the samples in one cooler. The cooler receipt temperature recorded by the laboratory was 3.4 degrees centigrade (°C). This temperature is within the recommended temperature

preservation range of 4°C +/- 2°C. A temperature blank was not included in the cooler. PES reviewed the case narrative and chain of custody and determined that the samples were received by the laboratory in good condition and properly preserved. No data were qualified based upon the sample collection, shipping, receipt or preservation issues.

## Holding Times

*USEPA 8260B (water)*
The VOC analyses were performed within nine days of sample collection. This is within the recommended holding time limit for VOC analyses of water samples. No data qualifications were warranted based upon holding times.

## Initial Calibration

Hard copies of the initial calibration data for this project are not required in the data deliverable. The laboratory is required to discuss discrepancies in initial calibration results associated with the project analyses if they occur. No discrepancies were reported; therefore no data qualifications were required.

## Continuing Calibration

Hard copies of the continuing calibration verification (CCV) data for this project are not required in the data deliverable. The laboratory is required to discuss discrepancies in continuing calibration results associated with the project analyses. No discrepancies were reported; therefore no data qualifications were required.

## Method Blank Results

*USEPA 8260B (water)*
Four laboratory method blanks were analyzed; one for each of the four water sample analysis lots. Therefore, this meets the required frequency for analyzing method blanks for the USEPA 8260B analytical method. The method blank results did not report any compounds at concentrations at or above the method reporting limits (MRLs: Note - MRLs are identified as Practicable Quantitation Limits [PQLs] in the laboratory report). No data qualifications were warranted.

## Trip Blank Results

*USEPA 8260B (water)*
One laboratory-prepared trip blank was analyzed with the project water samples. The trip blank results did not report any compounds at concentrations at or above the MRL. No data qualifications were warranted

## Field Duplicate Analyses

No field duplicates were required or collected during this field event.

## Laboratory Duplicate Analyses

*USEPA 8260B (water)*
The laboratory prepared duplicate laboratory control samples and duplicate matrix spike samples in lieu of project sample duplicates. This is acceptable for the method. The duplicate results are discussed in the Laboratory Control Sample and Matrix Spike sections below. No data qualifications were warranted based upon the lack of a project sample duplicate.

## Surrogate Recoveries

*USEPA 8260B (water)*
The surrogate percent recovery (%R) results for all USEPA Method 8260B water samples, sample duplicates, method blanks, matrix spikes and duplicates, and laboratory control samples were within the laboratory surrogate control limits. No data qualifications were required.

## Laboratory Control Samples

*USEPA 8260B (water)*
Four laboratory control samples (LCSs) were analyzed; one for each of the four USEPA 8260B analytical groups for water samples. The LCS's were analyzed at the appropriate frequency for this project. The LCS recovery results for all control compounds in analysis groups WG716867, WG717362 and WG717315 met the %R laboratory control criteria. In addition, a LCS duplicate (LCSD) was also prepared and analyzed for these three analysis groups. The LCSD %Rs and LCS/LCSD relative percent differences (RPDs) were also within the laboratory control criteria in analysis groups WG716867, WG717362 and WG717315. No data were qualified.

The LCS recovery results for all control compounds except acrylonitrile and chloromethane in analysis group WG716856 met the %R laboratory control criteria. For these two compounds, the %Rs exceeded the upper control limit, indicating a potential high bias for these compounds in associated samples. Acrylonitrile and chloromethane were not detected in the project samples; therefore, the potential high bias was not realized. In addition, a LCSD was prepared and analyzed for analysis group WG716856. The LCSD recovery results for all control compounds except 4-methyl-2-pentanone, acrylonitrile and chloromethane in analysis group WG716856 met the %R laboratory control criteria. For these three compounds, the %Rs exceeded the upper control limit, indicating a potential high bias for these compounds in associated samples. 4-methyl-2-pentanone, acrylonitrile and chloromethane were not detected in the project samples; therefore, the potential high bias was not realized. The LCS/LCSD RPDs were within the control criteria for all compounds in analysis group WG716856. No data were qualified based on the LCS/LCSD results.

## Matrix Spike/Matrix Spike Duplicates

*USEPA 8260B (water)*
Four matrix spike (MS)/matrix spike duplicate (MSD) pairs were prepared and analyzed; one MS/MSD pair for each water analysis group. The MS/MSD pairs were prepared from batch (non-project) samples. Several VOC target compounds were found to exceed the MS or MSD %R criteria or RPD criteria in MS/MSD pairs from analysis groups WG716867, WG717362 and

WG716856. Because the MS and MSD samples were prepared from non-project samples with a difference matrix and compound composition from the project samples, the MS/MSD exceedances are not considered sufficient cause to warrant qualification of the data. No data were qualified.

## Other Quality Control Issues

No other laboratory quality control issues were identified in the laboratory report.

## Quantitation Limits

Results of the VOC analyses were reported based on laboratory MRLs. The MRLs indicate the minimum quantity of a target analyte that can be confidently determined by the reference method. The MRLs were acceptable for the project; therefore, no data qualifiers were assigned.

## Data Assessment

No data were qualified. All data are judged to be acceptable for their intended use.

PES Environmental, Inc.
Engineering & Environmental Services

# MEMORANDUM

**TO:** Courtney Seim – Riddell Williams P.S.
Robert DiJulio – Wolfstone, Panchot & Bloch, P.S.

**FROM:** Matt Dahl, P.E.

**DATE:** July 7, 2014

**SUBJECT:** FINAL Air Sparging and Soil Vapor Extraction Design
Manhattan Village Shopping Center and Harris Properties
Normandy Park, Washington

**PROJECT NO.:** 1358.001.01

PES Environmental, Inc. (PES) has prepared this technical memorandum to present the engineering design for the air sparging (AS) and soil vapor extraction system (SVE) at the Manhattan Village Shopping Center (MVSC) property located at 17835 First Avenue South (the "MVSC property") and the Harris property located at 17817 – 17825 First Avenue South in Normandy Park, Washington (the "Harris property"), collectively referred to as the "Property." The "Site" as used in this memorandum refers to the locations where contaminants originating from the Property have come to be located. This memorandum has been prepared in accordance with the Washington Department of Ecology (Ecology) Model Toxics Control Act (MTCA) to address the requirements of Washington Administrative Code (WAC) 173-340-400(4).

This design includes the basis and plans for expanding an existing SVE system that has been operating at the Property since 2009 and installing an AS system to treat residual sources of PCE in soil and groundwater. This design document includes the layouts and design details for well and wellhead construction, system manifolds, process piping, SVE system process equipment, AS system process equipment, and associated utilities. The drawings are schematics, and as such do not show all potential construction conditions. Modifications to this design can occur due to minor interferences and structural obstructions as a component of the construction work. The following information is attached to this memorandum:

- Attachment A includes site figures;
- Attachment B includes the construction drawings; and
- Attachment C includes key design calculations.

## BACKGROUND

The MVSC and Harris properties are directly west of 1st Avenue South (Figure 1). MVSC is approximately four acres in area and consists of four buildings connected by a paved parking area and small areas of landscaping. The southern building is a single-story grocery store, the western building is a day care, the northern building is a strip mall which contains retail shops, restaurants, and the Four Star Dry Cleaners. The fourth building, located east of the strip mall, is currently unoccupied.

The Harris property includes six contiguous tax parcels with a total area of approximately 3.3 acres and is located adjacent and north of the MVSC property. The Harris property includes two residential structures, two single story commercial buildings, a storage shed, and two undeveloped tax parcels. The ground surface near the commercial buildings is a mix of gravel and pavement, the residences include lawns and landscaped areas, and the undeveloped parcels include vegetation and gravel. Records suggest that a dry cleaning facility (Manhattan Cleaners and Coin-Op Laundry) previously operated in the southern commercial building on the Harris property.

**Surface Elevations.** Surface elevations range from approximately 309 to 312 feet North American Vertical Datum 1988 (NAVD 88) on the MVSC property and between 307 to 309 feet on the Harris property. The properties are separated by a four to five foot high retaining wall, and the Harris property surface grade gently slopes to the north following local topography.

**Geologic Conditions.** Shallow soil across the Property generally consists of shallow silty sand from 0 to 10 feet below ground surface (bgs) and a well-sorted downward coarsening sand with varying amounts of silt and gravel to a depth of 46 to 56 feet bgs. Scattered silt and clay lenses are present at various depths from near surface to depths of approximately 32 feet bgs. A clay and silt unit has been encountered directly below the sand unit.

**Hydrogeologic Conditions.** Depth to groundwater on the Harris property is approximately 35 feet below ground surface (bgs) and 40 feet bgs on the MVSC property. The depth differences on the adjacent property are mainly due to differences in surface elevations. Groundwater flow direction has historically been toward the north with localized vectors ranging from north-northeast to north-northwest. Reported gradients on-Property have ranged from 0.004 to 0.006 feet/foot with gradients increasing significantly north of the Property (0.028 feet/foot). Reported hydraulic conductivities are between $1.3 \times 10^{-3}$ to $5.5 \times 10^{-2}$ centimeters per second (cm/s).

**Historical Releases and Investigations.** PCE has been detected in soil and groundwater at the Site, and available data indicate past releases of PCE from dry cleaning operations at the Four Star Dry Cleaners on MVSC property and from the former Manhattan Cleaners and Coin-Op Laundry on the Harris Property. Investigations indicated that PCE releases may have resulted in vadose zone soil impacts near the former septic systems at both properties, and the sanitary and possibly the storm sewer lines at the MVSC property. Groundwater impacts indicate that PCE in groundwater within the same areas as vadose zone impacts and extends north of the Property to the Dunn Lumber property.

**Current Extent of Impacted Soil.** Residual PCE likely remains in the vadose zone near the Four Star Cleaners, along the sanitary and storm sewer alignment near the MVSC strip mall, and near the former septic tank on the Harris property. In locations near the dry cleaner and sewer alignments, residual PCE is likely to remain in shallow soil within the upper silty sand to sand unit (e.g., upper 10 feet) and within the scattered silt and clay lenses (e.g., upper 32 feet). In locations near the former septic tank on the Harris property, residual PCE may remain in the lower vadose zone.

**Current Extent of Impacted Groundwater.** PCE in groundwater contamination is predominantly within the first 5 to 10 feet below the water table. The PCE plume appears to be primarily sourced from the northwestern corner of the MVSC property and southwestern corner of the Harris property, where the PCE in groundwater concentrations are the highest. However, there also appears to be remaining PCE in groundwater sourced along the sanitary sewer alignment (and possibly the storm sewer alignment) to the south to the suspected location of the former septic system on the MVSC property.

**Previous Remedial Actions.** The source of soil contamination was largely mitigated through operation of a seven-well SVE system in 1999 and 2000, replacement of 300 feet of sanitary sewer line behind the strip mall building on the MVSC property in July 2000, and excavation of PCE-impacted soil during removal of a septic tank on the Harris property in 2006. The SVE system operation and excavations resulted in significant reduction in PCE concentrations in groundwater.

**Current Remedial Action.** In 2009 a second SVE system was installed to address residual PCE in soil that was discovered following decommissioning of the first SVE system. The existing SVE system has been operated since 2009 and has removed an additional 95 pounds of residual PCE mass. Groundwater PCE concentrations continue to decline. The eastern half of the existing SVE system was temporarily shut down in February 2014 to evaluate for potential PCE rebound in nearby groundwater monitoring wells that have recently dropped below the MTCA Method A groundwater cleanup level (CUL) for PCE of 5 micrograms per liter (µg/L).

The existing SVE system consists of 10 SVE wells (SVE-1 through SVE-10), a 5 horse-power (HP) rotary lobe blower, moisture knockout, and condensate storage tank. As described in the April 2014 DRAFT operation and maintenance (O&M) status report[1], the SVE system has removed approximately 5 pounds of PCE over the last year. SVE well and discharge stack monitoring in November 2013 indicated that the SVE concentrations have declined significantly since 2010.

The existing SVE wells include a bypass valve that allows the wells to be operated under vacuum from the blower and to be open to atmosphere to induce fresh air into the subsurface. The SVE blower operates at approximately 240 to 280 standard cubic feet per minute (scfm), and when the entire well network is operating, each well is under approximately 3 to 7 inches of water column (in. w.c.) vacuum and generates between 18 to 26 scfm of vapor flow. Individual well vapor flow rates of more than 50 scfm have been observed when fewer SVE wells are

[1] PES, 2014. *Draft O&M Status Report - Manhattan Village and Harris Properties, September 2013 through March 2014.* April 2.

operated. Historical zone of influence (ZOI) has been observed at greater than 50 feet from the individual SVE wells.

Approximately 1,000 to 1,200 gallons of condensate is collected from the soil vapor stream when ambient air temperatures are cooler than the extracted soil vapors (mid-October and mid-April). Condensate drops out of the vapor stream in a moisture knockout vessel and is automatically transferred to a 200-gallon storage tank. The condensate is sampled and profiled prior to off-site disposal. Condensate generated in 2013 and early 2014 did not contain PCE above the laboratory method reporting limit (0.5 µg/L). This is likely a result of declining PCE concentrations in extracted soil vapors.

## SUMMARY OF REMEDIAL APPROACH

An AS and SVE system will be implemented to treat shallow groundwater and vadose zone soil in the southwest corner of the Harris property and the west of the sanitary sewer alignment on the MVSC property. This system will include an AS well network in shallow groundwater and a dual level SVE well network in the vadose zone. The overall remediation objectives of the AS and SVE systems is to reduce the mass of PCE in residual source areas to below the soil and groundwater CULs.

The AS wells will be designed to target the sand and silty sand aquifer directly above a silt and clay layer which has been encountered at depths of 46.5 to 50 feet bgs on the Harris property and 55 to 56 feet bgs on the MVSC property. The SVE wells will be installed at two levels within the vadose zone. Shallow screened wells (5 to 20 feet bgs) will target the upper vadose zone, and deeper screened wells (20 to 30 feet bgs on Harris property and 20 to 35 feet bgs on MVSC property) will target the lower vadose zone. Both the vadose zone and the aquifer contain varying amounts of gravel, and the vadose zone contains scattered silt and clay lenses at various locations and depths from near surface to approximately 32 feet bgs.

Operation of the AS and expanded SVE system will continue until groundwater within the AS ZOI is at or below the MTCA Method A groundwater CUL (5 µg/L). Residual PCE concentrations in areas outside of the AS system influence will be allowed to naturally degrade. When the AS and SVE systems is shut down, groundwater will be monitored for potential rebound, and soil samples will be collected to evaluate the removal of residual soil contamination to below the MTCA Method A soil CUL for PCE of 50 micrograms per kilogram (µg /kg). After achieving four consecutive quarters of below CUL groundwater monitoring results on the Property and documentation of below CUL soils on the Property, Ecology will be petitioned with a request for no further action (NFA) at the Site. The AS and SVE system will be decommissioned following Ecology approval.

## TECHNOLOGY JUSTIFICATION

AS and SVE has been selected to treat residual PCE in groundwater and soil source area groundwater plume. Application of these technologies is widely accepted for physically removing volatile organic compounds (VOC) from soil and groundwater.

**Air Sparging.** Critical design factors from the United States Army Corps of Engineers (USACE) engineering and design manual for AS include hydraulic conductivity of the saturated media, and the Henry's Law constant and vapor pressure of the VOC[2]. As listed below, the site criteria exceed the USACE minimum criteria:

**Table 1 – Critical Factors for Air Sparging**

| Parameter | USACE Minimum Criteria | Site |
|---|---|---|
| Media Hydraulic Conductivity | > $1 \times 10^{-4}$ cm/sec | $1.3 \times 10^{-3}$ to $5.5 \times 10^{-2}$ (pump test) |
| Chemical Henry's Law Constant | > $2 \times 10^{-3}$ atm-m3/mol | $1.5 \times 10^{-2}$ to $2.3 \times 10^{-2}$ |
| Chemical Vapor Pressure | > 1 mm Hg | 14 mm Hg |

Other pertinent factors favorable to AS include relatively shallow contaminant depth below water table (5 to 10 feet), relatively low and decreasing (with time) dissolved phase PCE concentrations, and moderate plume size (Figure 2). In addition, an air sparging pilot test conducted in June 2013[3] indicated that relatively low compressed pressures (8 pounds per square inch gauge [psig]) and flow rates (9 to 10 scfm) resulted in a projected 13 foot ZOI around the pilot test well, which is roughly equivalent to the bottom depth of the injection well screen below the water table surface.

**Soil Vapor Extraction.** The technology justification for SVE is largely based on the favorable performance of the existing SVE system and includes the relatively low vacuum requirements (less than 10 in. w.c.) and relatively large ZOI (50 feet or greater). It should be noted that the presence of scattered silt and clay lenses in various locations and depths to approximately 32 feet bgs will likely result in preferential vapor flow patterns around finer zones. If finer zones are impacted with PCE above the CUL (50 µg/kg), it may result in longer timeframes for PCE removal in these localized areas.

## GENERAL DESIGN CONSIDERATIONS

The following considerations were incorporated into the system design:

- Design capacity to operate the entire AS and SVE well fields at one time;
- Construct above ground AS and SVE manifolds on Harris property to decrease O&M costs, improve accessibility to monitor and control remediation wells, and minimize disruptions to MVSC property tenants and customers;
- Equipment noise limitations of 65 decibels for the blower and compressor;
- Automated condensate sparging and vapor recapture to lower O&M waste disposal fees;
- Freeze protection of the condensate piping for year-round operation; and

[2] USACE, 2008. *In-Situ Air Sparging, Manual No. 1110-1-4005*. Page 3-7. January.
[3] PES, 2014. *Air Sparging Pilot Test, Manhattan Village and Harris Properties, Normandy Park, Washington*. October 2.

- Automated systems and alarms to protect equipment and operator, and to decrease O&M costs.

## AIR SPARGING SYSTEM DESIGN

The AS system includes 31 air sparging wells and interconnecting piping, manifold, air compressor, and heat exchanger. Groundwater impacts appear to be limited to the upper 5 to 10 feet of the saturated zone, and therefore AS wells will be screened at least 10 feet below groundwater. Injection air pressures, flow rates, and well spacing will be based on the results of the 2013 AS pilot test. Well screen depths will be limited by the presence of a silt and clay layer that has been observed at between 12 to 16 feet below groundwater. Contingency AS header piping will be installed on the Harris property east of existing SVE-4 so that additional AS wells may be installed and operated if needed.

The compressor will be sized to operate all 31 wells simultaneously and include extra capacity for the diffused aeration tank (see SVE system discussion below) and for additional AS wells along the contingency header. The system is expected to operate at a flow rate of 10 scfm per well at 8 psig wellhead pressure, although the actual operational flow rate and pressure will be determined through startup testing. Well spacing is based on the results of the 2013 AS pilot test which determined an approximate 1 to 1 ratio of screen depth below the water table and ZOI radius, and on the depth of a silt/clay layer that has been encountered during previous drilling and well installation activities. Based on these factors, spacing for the wells on the Harris property includes a 13 foot ZOI, and spacing for wells on the MVSC property includes a 15 foot ZOI. The actual screen depths will be determined in the field during drilling. Sheet C-2 includes representation of the ZOIs for the AS wells.

The following subsections describe the major components of the AS system, their function, and key process control equipment and parameters. Construction drawings including layout, details, and sections are included in Attachment B. A schematic of the entire AS system is included on Sheet P-3.

**Air Sparging Wells.** The AS system will consist of 31 AS wells. One well, AS-1, was installed in May 2013 for the pilot test. The remaining 30 wells, AS-2 through AS-31, will be installed in the southwestern corner of the Harris Property and adjacent to the sanitary sewer alignment on the MVSC property (Drawing C-3). AS-1 was installed with a 1-inch diameter Schedule 80 polyvinyl chloride (PVC) casing and a 2-foot long PVC screen (0.020-inch slot). The remaining 30 wells will be constructed similarly except that 2-inch diameter materials will be installed. All wellheads will be completed in flush-with-grade traffic rated monuments. As shown on Sheet C-5, a threaded end cap will be fitted to the bottom of each well screen, and the screened interval will be backfilled with a 10-20 silica sand filter pack which extends 6 inches above the top of screen. A 2-foot bentonite chip seal will be constructed above the sand and the remaining well annulus will be filled with cement bentonite grout.

**Piping and Manifolds.** Pressurized air will be conveyed from the air compressor, through a pipe manifold, and through 1-inch diameter lateral pipes to each AS well. Schedule 40 galvanized will be used for above ground pressurized piping and manifolds. Above ground

galvanized pipe may either be threaded or welded. Schedule 80 PVC will be used for below ground piping. Weather resistant EPDM hose will be used when needed to make above ground piping connections.

- Manifold. Consists of a 3-inch diameter pipe from the compressor, reducing tees, 1-inch diameter AS well lateral pipes, and a 2-inch diameter spare AS pipe. Laterals to each AS well include a 1-inch brass ball valve for shut-off and flow control, pressure gauge, rotameter, and 1-inch brass check valve. The lateral to the 2-inch diameter spare AS pipe includes a 2-inch brass ball valve. The manifold piping will be secured with supports and pipe clamps. The manifold is shown on Sheets C-7 and C-8.
- Lateral Piping: There are two main corridors for AS lateral piping. One corridor extends to wellheads for AS-2 through AS-6 and includes the 2-inch diameter contingency pipe, and the other corridor extends to the remaining wellheads. The second corridor includes the lateral pipes for AS-7 through AS-31. The laterals for AS-8 through AS-27 will penetrate the retaining wall through cored holes with the pipes secured on supports with pipe clamps. Lateral pipes in trenches will be buried a minimum of 18 inches below grade, and the trench depth and width will vary by location. Lateral pipes branch from the main trench to the AS wells. At a minimum, piping must be spaced 1 inch from the trench wall and 1 inch from other pipes. Piping layouts are shown on Sheets C-3 and C-4, wellhead connection details are shown on Sheet C-5, trench sections are shown on Sheet C-6, and retaining wall penetrations are shown on Sheet C-7.
- Spare AS Pipe: The 2-inch diameter galvanized pipe will be routed in a trench with lateral pipes for AS-2 through AS-6. The spare pipe will daylight at the retaining wall and be routed above ground along the retaining wall to near SVE-9. The above ground section will include 2-inch diameter galvanized tees and threaded end caps spaced every 30 feet. The entire above ground section will be secured with supports and pipe clamps. Pipe routing is shown on Sheet C-4, and trench sections are shown on Sheet C-6.
- Lateral to Diffused Aeration Tank: A 1-inch galvanized pipe will be extended from the 3-inch compressed air line to the diffused aeration tank. The lateral will include a 1-inch brass ball valve for shut-off and flow control, pressure gauge, rotameter, and 1-inch brass check valve.

**Mechanical Equipment.** Mechanical equipment will be installed in the remediation equipment enclosure located on Harris Property at the approximate location shown on Sheet C-3. Mechanical equipment includes positive displacement blower (i.e., low pressure air compressor) and a heat exchange. Equipment layout is shown on Sheet C-7, and a schematic of the entire AS system is shown on Sheet P-3.

- Compressor (AC-301): Pressurized air will be supplied by a single positive displacement blower capable of delivering 360 scfm at approximately 12 psig in order to provide at least 10 psig at the manifold. The actual compressor type (e.g., rotary lobe, etc.) and pressure rating will be determined by the remediation equipment vendor. The motor will include a variable frequency drive so that the overall system flow rate may be adjusted to match system requirements. The compressor will be fitted with an inlet filter, influent and effluent silencers, and housed in a weather resistant sound enclosure rated to reduce

the sound within 3 feet of the enclosure to approximately 65 decibels. The sound enclosure will include air cooling and sound dampened air vents. The compressor discharge line will include a flow switch, which will notify the operator when adequate AS flow is not present. Automatic operation will require that the SVE blower be operating at least 1.5 times the design flow rate of the AS system (465 scfm).

- Heat Exchanger (HEX-301): Pressurized air exiting the compressor will be cooled using an air to air heat exchanger to approximately 20 degrees above ambient temperatures.

## SOIL VAPOR EXTRACTION SYSTEM DESIGN

The SVE system includes 22 SVE wells (10 existing and 12 new) and interconnecting piping, piping manifold, moisture knockout, condensate storage, and blower. The SVE system will be designed and operated to control off-gas from AS and to address residual PCE concentrations in soil that appear to be outside of the area of influence from the existing SVE system. The new and operating SVE wells will be screened in the vadose zone above the water table. Three of the new wells will be screened in the upper vadose zone (5 to 20 feet bgs), and the remaining nine wells will be screened in the lower vadose zone (20 to 35 feet bgs).

The system is designed to operate at flow rate of 40 scfm per well at 10 in. w.c. wellhead vacuum, although the actual operational flow rate and vacuum will be determined through startup testing. Well spacing is based on providing an approximate 2:1 ratio of SVE to AS flow, and an anticipated ZOI of 40 feet (see Sheet C-3).

The SVE system includes a management and storage for SVE condensate that drops out of the soil vapor stream and into the moisture knockout tank. Knockout water will be processed through a diffused aeration tank (DAT) and sparged so that residual PCE, if present in the water, may be transferred back into the SVE vapor stream. The sparged water will then be transferred to a holding tank for sampling, waste profiling, and off-site disposal.

Based on the expected mass transfer of PCE from soil and groundwater, the SVE system will be exempt from vapor treatment per Puget Sound Clean Air Agency (PSCAA) Regulation I, Article 6, Section 6.03(C)(94) and the Ecology toxic pollutant source control regulations WAC 173-460. Therefore, the SVE effluent will be discharged directly to atmosphere. If SVE effluent concentrations are higher than anticipated and result in mass discharge rates in excess of the PSCAA and Ecology limits (< 500 and 32.4 pounds per year, respectively), the SVE effluent stack can be bypassed to allow vapor treatment with granular activated carbon (GAC) prior to discharge.

The following subsections describe the major components of the SVE system, their function, and key process control equipment and parameters. Construction drawings including layout, details, and sections are included in Attachment B. A schematic of the entire SVE system is included on Sheet P-2.

**Soil Vapor Extraction Wells.** The SVE system will consist of 22 SVE wells and includes 10 existing wells which are currently operating as part of the existing SVE system (SVE-1 through SVE-10), 6 wells installed in November 2013 as part of a supplemental remedial investigation (SVE-11A through SVE-13B), and 6 new wells which will be installed prior to or during construction (SVE-14 through SVE-19). Existing wells SVE-1 through SVE-10 are constructed of 2-inch diameter Schedule 40 PVC and include 20- to 25-foot long well screens (except for SVE-6 which includes a 5-foot screen). The new wells will be constructed with 4-inch diameter Schedule 40 PVC and include a 0.020-inch slot PVC screen. All wellheads will be completed in flush-with-grade traffic rated monuments. As shown on Sheet C-5, a threaded end cap will be fitted to the bottom of each well screen, and the screened interval will be backfilled with a 10-20 silica sand filter pack which extends 2 feet above the top of screen. A 1.5 to 2-foot bentonite chip seal will be constructed above the sand and the remaining well annulus will be filled with cement bentonite grout.

**Piping and Manifolds.** Extracted soil vapors will be conveyed from the wells through lateral pipes, manifold and header pipes, moisture knockout, blower, and discharge stack. Schedule 40 PVC will be used for all laterals, manifolds, header to the moisture knockout, and discharge stack. Schedule 40 galvanized will be used on vapor piping between the knockout and the discharge stack, and on water piping between the condensate tanks.

- Manifold and Header Piping: The header consists of a new 6-inch diameter pipe that is routed from the knockout to the 6-inch diameter manifold. The new 6-inch header also connects to the existing 4-inch header for existing wells SVE-4 through SVE-10. The manifold includes tie-ins to the 2-inch diameter laterals from existing wells SVE-1 through SVE-3 and new wells SVE-11A through SVE-19. The lateral pipes within the manifold will include a 2-inch PVC ball valve for shut-off and flow control, and include a PVC labcock valve for sampling and monitoring vacuum at the individual SVE wells. The labcock may be removed, or a separate threaded plug may be installed for monitoring flow rate SVE well flow rate using a thermal anemometer. The manifold will be located adjacent to the retaining wall so that the individual laterals may tie directly into the manifold after passing through the wall. The manifold and header piping will be secured to the retaining wall with supports and pipe clamps. Above ground piping will slope towards SVE wells at a one percent slope. The manifold and header locations are shown on Sheet C-3, and manifold details are shown on Sheet C-9.
- Below Ground Piping and Trenching: Lateral pipes to new wells SVE-11A through SVE-19 will be routed below grade in common trenches wherever possible. Laterals for SVE wells SVE-11A through SVE-16 will extend south from the manifold and penetrate the retaining wall through cored holes with the pipes secured on supports with pipe clamps. Pipes in trenches will be buried a minimum of 18 inches below grade, and the trench depth and width will vary by location. At a minimum, piping must be spaced one-inch from the trench wall and one inch from other pipes. Below ground pipe locations are shown on Sheet C-3, well connection details are shown on Sheet C-5, trench sections are shown on Sheet C-6 and the manifold connections and retaining wall penetrations are shown on Sheet C-9.

- Discharge Pipe and Stack: The blower discharge includes several feet of a 6-inch diameter galvanized pipe to dissipate heat from the blower, and a 10 foot tall by 8-inch diameter Schedule 40 PVC stack pipe. The discharge stack will include a PVC labcock valve for monitoring and sampling.
- Water Piping: 1-inch diameter pipes will be installed between the condensate tanks and condensate transfer pumps. The pipes will include union fittings and ball valves at tanks and pumps, and will be heat traced, insulated, and wrapped with PVC sheets to prevent freezing.

**Mechanical Equipment.** Mechanical equipment will be installed in the remediation equipment enclosure located on Harris Property at the approximate location shown on Sheet C-3. Mechanical equipment includes an SVE blower and two condensate transfer pumps. Equipment layout is shown on Sheet C-6, and a schematic of the entire SVE system is shown on Sheet P-2.

- Blower (BL-101): SVE airflow and vacuum will be generated by a single positive displacement blower capable of delivering 880 scfm at approximately 60 in. w.c. vacuum in order to provide at least 25 in. w.c. vacuum at the upstream side of the inlet filter. The actual blower type (e.g., rotary lobe, etc.) and vacuum rating will be determined by the remediation equipment vendor. The blower motor will include a variable frequency drive so that the overall system flow rate may be adjusted to match system requirements. The blower will be fitted with an inlet filter, influent and effluent silencers, and housed in a weather resistant sound enclosure rated to reduce the sound within 3 feet of the enclosure to approximately 65 decibels. The sound enclosure will include air cooling and sound dampened air vents. The blower inlet line will include a flow meter and flow switch, which will notify the operator in the event of low SVE flow (e.g., 1.5 times the design AS flow rate, see above). A high level alarm float switch in the knockout tank (T-201) will disable the blower (and air compressor).
- Knockout Tank Transfer Pump (P-201): A centrifugal transfer pump will automatically transfer condensate water from the knockout tank to the DAT. Pumping will occur based on level control in tank knockout and can only be initiated when the diffused aeration tank level is low. High level alarm in any tank will disable the pump.
- Diffused Aeration Tank Transfer Pump (P-202): A centrifugal transfer pump will automatically transfer condensate water from the DAT to the holding tank. Pumping will initiate on high level in the knockout tank (P-201) and stop on low level in the DAT. This sequence is to ensure that the DAT level is low prior to transferring in fresh condensate from the knockout. High level alarm in either the DAT or the holding tank will disable the pump.

**Condensate Management and Storage Tanks.** Three tanks will be used to manage and store condensate. As referenced above, the tanks include a condensate knockout tank (T-201), DAT (T-202), and holding tank (T-203). Condensate accumulation is expected from mid-October through mid-April when ambient temperatures drop below the soil vapor temperature. Condensate accumulation in SVE systems is typically greatest in December and January when ambient temperatures are at their lowest, and the tank sizing is based on the following temperature related factors:

- An average daily cold weather condensate accumulation rate of 42 gallons per day is estimated based on average soil vapor temperature of 54°F and average ambient air temperature of 40°F;
- Process volumes in tanks T-201 and T-202 are rated at 75 gallons per day, which is equivalent to the single day condensate accumulation rate (above) with a 1.75 safety factor. This estimate allows for ambient temperatures below freezing; and
- Storage volume in T-203 is designed to hold at least 2 weeks of water at the below-freezing condensate accumulation rate, and at least 4 weeks of water at the average (cold weather) condensate accumulation rate.

Tanks T-201 and T-202 are sized to process condensate at a rate of one pump cycle per day, maximum, in order to optimize PCE transfer by maximizing the overall air to water ratio in the diffused aeration tank.

- Knockout Tank (T-201): The moisture knockout tank will remove moisture droplets from vapor stream and provide process capacity for 75 gallons of SVE condensate between the level switches for transfer pump P-201. The overall volume and configuration of this tank will be determined by the remediation equipment manufacturer.
- Diffused Aeration Tank (T-202): Consists of a 200-gallon polyethylene tank with a compressed air delivery pipe, a 5-way PVC pipe fitting, four sparger pipes installed inside and at the base of the tank, and a vent pipe connected to the 6-inch SVE inlet line. All pipes will be 1-inch diameter Schedule 40 PVC and the sparger pipes will include 1/8-inch diameter holes on 3 inch centers. The sparger pipes will be submerged with approximately 2 feet of water (below the low level shut-off switch) and with the 75-gallon process volume. Initially the compressed airflow rate will be set at 6 scfm to allow a single-day air to water ratio of approximately 450 to 1 (which is greater than the air to water ratio of a typical shallow tray air stripper).
- Holding Tank (T-203): Consists of a 1,500 gallons with approximately 1,200 gallons of storage below the high level float shut-off.

## CONTROLS

A NEMA 4X rated control panel including a programmable logic control system will be located inside the remediation equipment enclosure. The panel will provide automatic control of system components and operating parameters. The control panel will be fabricated by a UL 508 shop and meet national and local electric codes. The control panel will include a blank exterior door with an internal swing door for operator access to controls. Each motor associated with the process equipment will have a motor starter (with thermal overloads as well as circuit breaker wiring protection), a Hand/Off/Auto (HOA) switch, and a green run-light. Alarm indicator lights with first-fault lockout will be provided. The internal swing door will also include a system power selector switch (On/Off) and hour meters for the blower and compressor. All lights, selector switches, push buttons, hour meters, and other panel face-mounted devices will be labeled with white letters engraved on black metal labels.

The control panel will house an auto-dialer with inputs for all alarm conditions for the system, and the auto-dialer will be equipped with battery backup. The auto-dialer will alert the operator to major mechanical issues such as power interruption, blower shut-off or low flow, compressor shut-off or low flow, and high-high liquid level in the condensate tanks. Each alarm, when triggered, will be configured to automatically shut down equipment operation.

## POWER SUPPLY

The blower and compressor are expected to require 3-phase 460 voltage alternating current (VAC) at 60 hertz frequency. According to preliminary discussions with Puget Sound Energy, power is available nearby and may require transformer upgrade and an additional power pole. Sheets C-1 and C-4 show the locations of pole mounted transformers near the alley north of the MVSC strip mall building.

## CONSTRUCTION

Construction tasks include permitting, site preparation, well installation, trenching and piping, and equipment installation.

**Permitting.** Anticipated permits include local grading and electric permits, and a pre-application review conference with the City of Normandy Park to review the overall site plan and discuss the project to determine the applicable requirements in the local code. Prior to the conference, the applicant is required to submit an application package including the application form, overall site plan showing both on-site and off-site features, a written narrative and $300 fee. According to the City Planner, pre-application review period of two to four weeks is typical, and the applicant should anticipate additional fees for outside consultant review.

**Site Preparation.** Underground utility locations will be cleared prior to any drilling or trenching activities. The proposed locations of the remediation wells and trenches will be marked with white spray paint. At least five days prior to any subsurface work, a One-Call ticket will be submitted to mark the locations of utilities in the public right-of-way. A private locating company will also be contracted to mark the locations of utilities outside of the right-of-way.

All remediation wells on MVSC property will be cleared with an air knife/ vacuum truck rig, and remediation wells on the undeveloped Harris property will be cleared with hand tools. Clearing will be performed to a minimum depth of 4 feet bgs. If planned drilling locations interfere with underground utilities, the well will be relocated a safe distance away, but as close to the original location as possible.

Due to the number and extent of underground utilities on the MVSC property, it is expected that the remediation trenches will intersect utility trenches in several locations. The contractor will be expected to field locate and pothole to verify the exact location of existing utilities, and will be expected to protect the utilities and repair if damaged.

**Well Installation.** The AS and SVE wells will be installed by a Washington-licensed driller. During drilling, samples will be collected for lithology and for waste disposal profiling at 5 foot intervals. Continuous samples will also be collected from the AS wells starting at the 40 foot

depth interval to find the silt/clay layer at the base of the aquifer. The drilling work will be observed by field geologist who will log samples, monitor drilling activities, record well construction information, and prepare boring logs and well construction diagrams for each well.

The wells will be completed below grade and temporarily covered with a metal plate so that the construction contractor may find the wells and construct the wellhead completions as shown in the plans. The wells on the MVSC property will also include an asphalt patch covering the metal plate so that the well locations can be driven on during the interim period between drilling and construction.

**Trenching and Piping.** Trenches will be constructed a minimum of 12-inches wide and excavated to a minimum depth of three inches deeper than the bottom of the lowest installed pipe. The AS and SVE pipes will be buried at least 18-inches deep, covered with a minimum of 8-inches of compacted sand overlain by compacted backfill. The trenches on MVSC property will be paved to match the existing ground surface. Trenches on Harris property will be graded covered with black weed barrier shields, and a thin layer of gravel. Utility pipes in unpaved areas will be buried a minimum of 36 inches below grade.

Above-ground piping will be secured to supports using pipe clamps. Manifold supports shall be mounted to the concrete retaining wall.

The SVE manifold and SVE and AS pipe penetrations will require additional evaluation and field verification by the contractor so that these features may be constructed efficiently and cleanly relative to the retaining wall construction, remediation pipe locations, pipe slopes, underground utilities, etc. Prior to construction the contractor shall develop shop drawings for a proposed configuration and submit to the engineer for review and approval.

**Remediation Equipment Installation.** The remediation equipment consists of the SVE blower assembly, SVE compressor assembly, heat exchanger, transfer pumps, moisture knockout, DAT, 1,500-gallon storage tank, and control panel. The blower and compressor assemblies will be skid mounted and installed inside weather resistant sound enclosures. The compressor skid will include the compressor assembly and heat exchanger, and the blower skid will include the blower assembly, transfer pumps, moisture knockout, and DAT. The skids may be separate or combined and include the control panel.

The skid mounted equipment will be installed on 6-inch thick gravel pad underlain with black weed barrier shield material, and inside a 6 foot high chain link fence. Prior to construction the contractor shall develop shop drawings for the chain link fence materials and configuration per Chain Link Fence Manufacturers Institute guidelines and submit to the engineer for review and approval.

The contractor will coordinate a power drop for the remediation equipment with Puget Sound Energy (PSE). According to discussion with the local field engineer, there is currently a three month backlog for installation of transformers and utility poles. PSE will install power from the transformer to be agreed upon electrical meter location, and the contractor will be responsible for field wiring to the remediation equipment as well as field interconnections between equipment as specified by the equipment manufacturer.

The contractor will coordinate a telephone cable with Century Link, who will drop the cable to be agreed upon location. The contractor will be responsible for additional field wiring to the control panel.

**Shakedown and Testing.** Equipment shakedown and testing will be performed to ensure all automation and safety controls are fully functional. The AS and SVE well fields will be isolated during equipment shakedown. System shakedown activities will include pressure testing process piping, leak-checking liquid transfer lines, checking motors for proper rotation, voltage, and amperages, verifying instrument signals, verifying analog and discrete signals to control system, testing system operation with clean water and ambient air, and setting valves to proper pre-start positions.

**Survey.** The new AS and SVE wells will be surveyed by a licensed surveyor. Horizontal coordinates will be surveyed to the Washington State Plane coordinate system, and elevations surveyed to NAVD 88.

## OPERATION AND MAINTENANCE

A project specific O&M plan will be developed to describe to describe startup procedures, guidelines for overall system operation, manufacturers recommendations for equipment maintenance, preventative maintenance schedule, and forms. Initial operation will include baseline groundwater monitoring, SVE system startup and balancing, AS system startup and balancing, and relatively frequent O&M inspections and monitoring over the first several weeks of operation. After system operation is stabilized, O&M will be conducted on a monthly basis, and preventative maintenance performed in accordance with equipment manufacturer's guidelines.

Performance monitoring will be performed periodically to assess whether changes in system performance are needed to optimize contaminant removal efficiency. Performance monitoring will include stack emissions monitoring, groundwater quality monitoring, and groundwater gradient evaluation.

## RESIDUALS

Drill cuttings, trench spoils, purge water, decontamination water, and SVE condensate water generated during system construction, monitoring, and O&M activities will be contained in segregated approved waste containers (55-gallon drums, roll-off containers, etc.). Waste containers will be clearly labeled with a description of contents and the accumulation date. The waste will be sampled, profiled, and properly disposed of at an approved facility.

## REPORTING

The following reports are recommended as part of the remedial approach:

- Health and Safety Plan;
- O&M Manual;
- Construction and Startup Report; and

- Semi-annual Progress Reports.

## LIMITATIONS

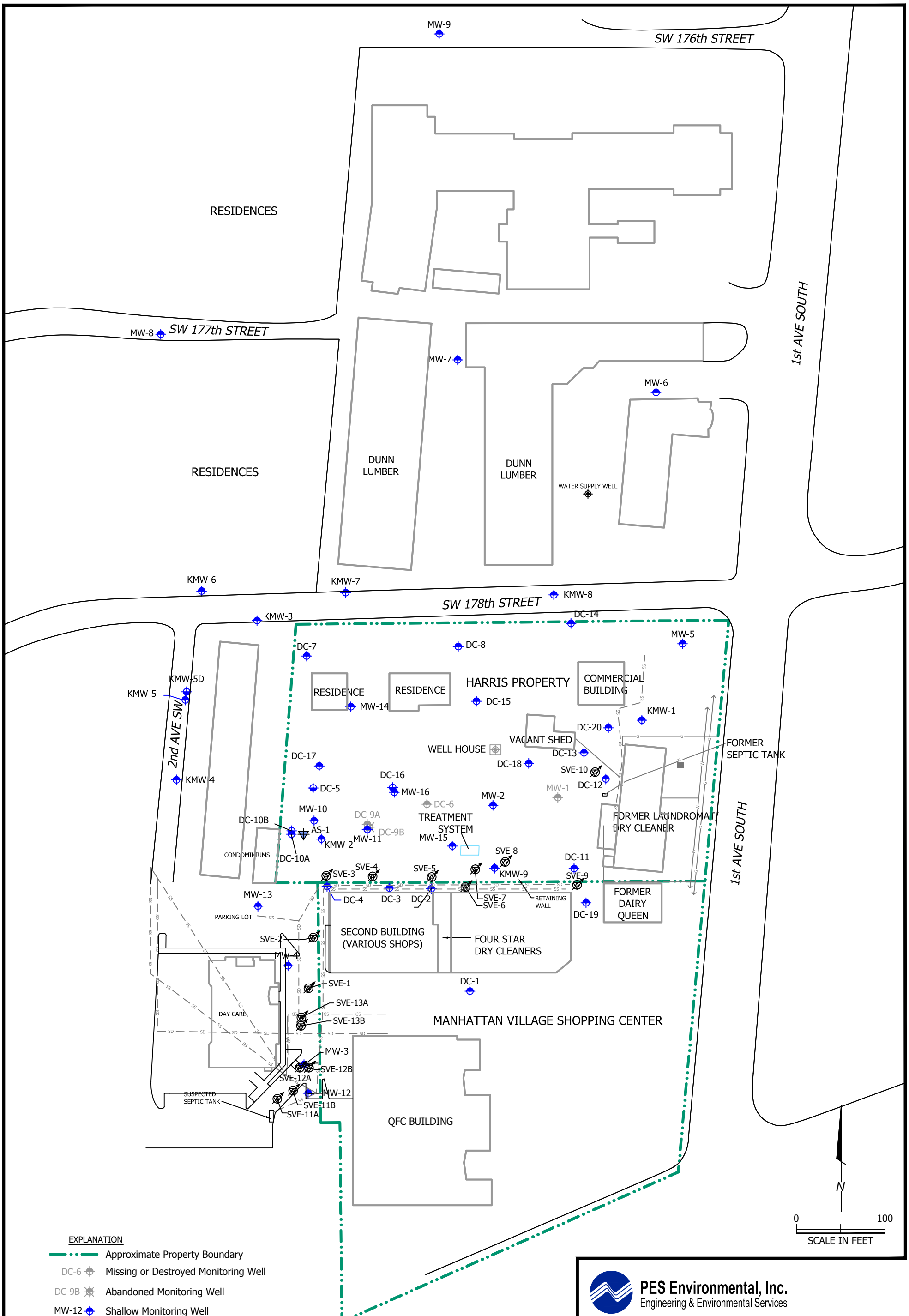
The services described in this technical memorandum were performed consistent with generally accepted professional consulting principles and practices. No other warranty, expressed or implied, is made. These services were performed consistent with our agreement with our client. This technical memorandum is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this technical memorandum apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

Enclosures: Attachment A – Site Figures
Attachment B –Construction Drawings
Attachment C – Calculations

# ATTACHMENT A

# SITE FIGURES




**PES Environmental, Inc.**
Engineering & Environmental Services

**Site Map**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

FIGURE
1

| 1358.001.01.003 | 1358-00101005_SVE_Fig1 | DRAFT | 3/14 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |

MW-9
SW 176th STREET
RESIDENCES
MW-8
SW 177th STREET
MW-7
(265.28)
MW-6
1st AVE SOUTH
266
267
268
269
270
271
272
273
DUNN LUMBER
DUNN LUMBER
RESIDENCES
WATER SUPPLY WELL
KMW-6
KMW-7
KMW-8
KMW-3
SW 178th STREET
DC-14
(271.84)
6.0
MW-5
DC-7
(271.94)
15
DC-8
(272.01)
11
HARRIS PROPERTY
COMMERCIAL BUILDING
KMW-5D
KMW-5
(271.80)
2nd AVE SW
RESIDENCE
RESIDENCE
MW-14
(272.25)
<1.0
DC-15
(272.28)
KMW-1
(272.51)
DC-20
(272.50)
1.7
VACANT SHED
WELL HOUSE
FORMER SEPTIC TANK
DC-17
(272.51)
21
KMW-4
DC-5
(272.65)
<1.0
DC-16
MW-16
(272.59)
2.5
DC-6
DC-13
(272.59)
1.7
DC-18
(272.59)
4.8
MW-2
(272.83)
2.4
MW-1
DC-12
(272.75)
2.3
DC-10B
MW-10
(272.88)
4.1
DC-9A
DC-9B
AS-1
DC-10A
(272.89)
19
KMW-2
(272.95)
22
MW-11
(272.87)
22
TREATMENT SYSTEM
MW-15
(272.89)
<1.0
FORMER LAUNDROMAT/ DRY CLEANER
CONDOMINIUMS
KMW-9
DC-11
MW-13
(273.08)
<1.0
PARKING LOT
DC-4
(273.06)
11
DC-3
DC-2
RETAINING WALL
DC-19
(273.22)
FORMER DAIRY QUEEN
SECOND BUILDING (VARIOUS SHOPS)
FOUR STAR DRY CLEANERS
MW-4
(273.28)
8.1
DC-1
(273.52)
DAY CARE
MANHATTAN VILLAGE SHOPPING CENTER
MW-3
(273.53)
4.0
MW-12
(273.55)
<1.0
SUSPECTED SEPTIC TANK
QFC BUILDING
N
0
100
SCALE IN FEET

EXPLANATION

- Approximate Property Boundary
- DC-6 Missing or Destroyed Monitoring Well
- DC-9B Abandoned Monitoring Well
- MW-12 Shallow Monitoring Well
- DC-16 Deep Monitoring Well
- AS-1 Air Sparge Well
- (273.52) Groundwater-Level Elevation in feet NAVD 88 on May 28, 2013
- 273 Generalized Groundwater Elevation Contour (dashed where inferred)
- 22 Tetrachloroethene (PCE) concentration in micrograms per liter (ug/L); results in red exceed the MTCA Method A cleanup level
- <1.0 PCE not detected at or above the indicated method reporting limit (MRL)

**PES Environmental, Inc.**
Engineering & Environmental Services

**Groundwater Elevations, Contours, and PCE Concentrations – May 2013**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

FIGURE 2

| 1358.001.01.003 | 1358-00101003_GW_1-2 | MVD | 8/13 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |

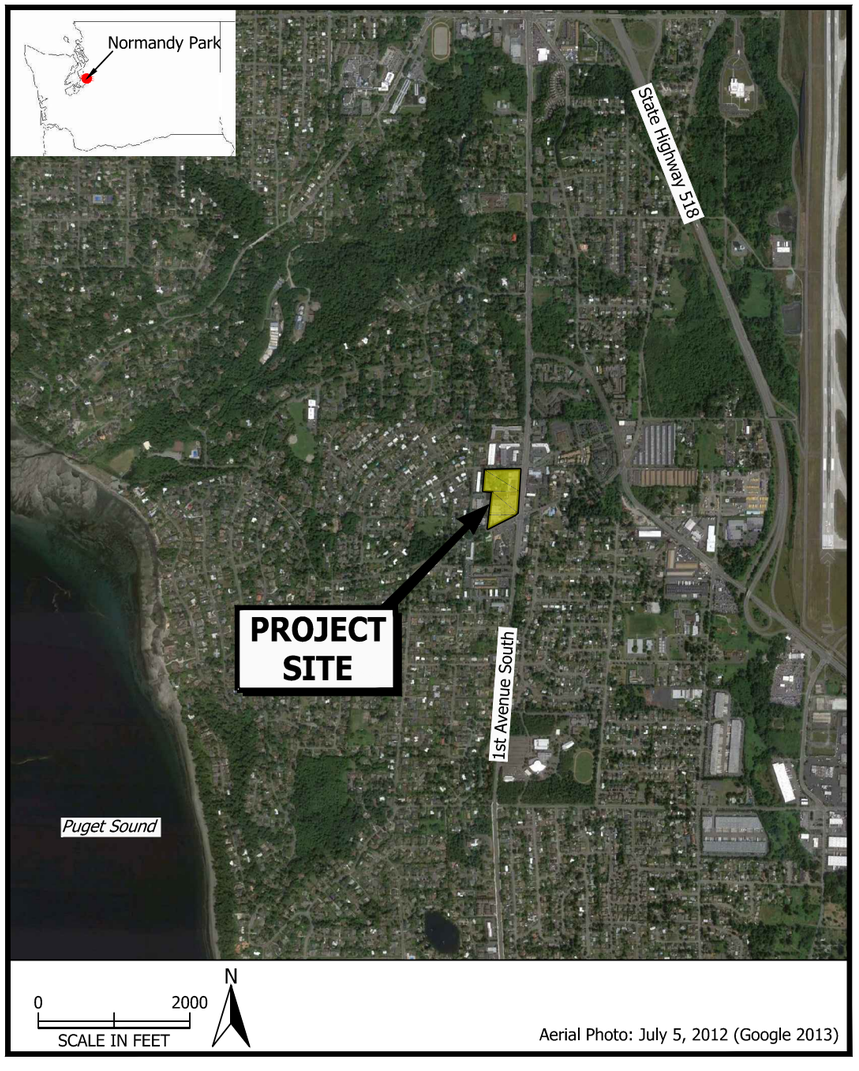
# ATTACHMENT B

# CONSTRUCTION DRAWINGS

# AIR SPARGING AND SOIL VAPOR EXTRACTION SYSTEMS DESIGN
# MANHATTAN VILLAGE SHOPPING CENTER / HARRIS PROPERTIES

### 17817, 17825, AND 17835 1ST AVENUE SOUTH
### NORMANDY PARK, WASHINGTON

## SITE LOCATION MAP




Aerial Photo: July 5, 2012 (Google 2013)

## DRAWING INDEX


| SHEET NUMBER | SHEET TITLE |
|---|---|
| T-1 | COVER SHEET |
| G-1 | GENERAL NOTES |
| C-1 | EXISTING SITE PLAN |
| C-2 | ZONE OF INFLUENCE LAYOUT |
| C-3 | SITE LAYOUT - WEST |
| C-4 | SITE LAYOUT - EAST |
| C-5 | WELL CONSTRUCTION DETAILS |
| C-6 | TRENCH SECTIONS |
| C-7 | RETAINING WALL PENETRATION AND EQUIPMENT LAYOUT |
| C-8 | AS MANIFOLD DETAILS |
| C-9 | SVE MANIFOLD DETAILS |
| P-1 | PROCESS AND INSTRUMENTATION NOTES |
| P-2 | PROCESS AND INSTRUMENTATION DIAGRAM - SVE SYSTEM |
| P-3 | PROCESS AND INSTRUMENTATION DIAGRAM - AS SYSTEM |


| No. | Date | Revisions | By |
|---|---|---|---|
| 0 | 7/22/14 | Issued for Bid | |

Scale: AS NOTED
Designed by: MD
Drawn by: BP
Checked by: BO
Approved by: MD

MATTHEW V. DAHL
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REGISTERED
PROFESSIONAL ENGINEER


PES Environmental, Inc.
Engineering & Environmental Services


**Cover Sheet**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet T-1

| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |
|---|---|---|---|
| 1358.001.01.005 | 1358-00101005_SVE_r1_T1 | BO | 7/14 |

## GENERAL NOTES:

1. LOCATIONS AND DESCRIPTIONS OF UTILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND ARE COMPILED FROM AVAILABLE RECORDS AND/OR LIMITED FIELD SURVEYS.
2. FIELD LOCATE AND POTHOLE TO VERIFY EXACT LOCATIONS OF EXISTING UTILITIES TO DETERMINE THE EXTENT OF PROTECTION REQUIRED AND/OR CHANGES THAT MAY BE REQUIRED PRIOR TO SUBSURFACE WORK. USE CARE WHEN EXCAVATING OR DRILLING NEAR UTILITIES, AND REPAIR ANY DAMAGED AT CONTRACTORS EXPENSE.
3. UTILITY LOCATES: CALL MINIMUM 5 DAYS AND MAXIMUM 10 DAYS BEFORE EXCAVATION AND DRILLING (1-800-424-5555).
4. COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS TO PERFORM WORK.
5. OBTAIN ALL PERMITS, INSURANCES, AND LICENSES TO PERFORM WORK.
6. CONSTRUCTION WORK AREA SHALL BE SECURED AGAINST UNAUTHORIZED ENTRY. MAINTAIN PEDESTRIAN ACCESS TO ALL BUILDING ENTRANCES AND EXITS, AND POST TEMPORARY SIGNAGE FOR DIRECTING PEDESTRIAN AND VEHICLE TRAFFIC AROUND THE CONSTRUCTION AREA.
7. ALL STREETS AND PARKING AREAS ADJACENT TO THE PROJECT SHALL BE KEPT CLEAN OF ALL MATERIAL DEPOSITS RESULTING FROM THE CONTRACTORS OPERATIONS.
8. PROTECT ALL EXISTING STRUCTURES, EXISTING WELLS, AND OTHER EXISTING SITE FEATURES, AND REPAIR ANY DAMAGED AS A RESULT OF THE WORK AT THE CONTRACTORS EXPENSE.
9. UPON COMPELETION OF WORK, RESTORE AREA TO ORIGINAL CONDITION.

## CONSTRUCTION NOTES:

1. VERIFY ALL FIELD CONDITIONS AND DIMENSIONS PRIOR TO WORK.
2. CUT ASPHALT, CONCRETE, AND CURBS IN A STRAIGHT LINE PRIOR TO REMOVAL FOR TRENCHING OR DRILLING.
3. EXCAVATE TRENCHES MINIMUM OF 3 INCHES DEEPER THAN BOTTOM OF LOWEST PIPE. COVER ALL PIPES WITH AT LEAST 6 INCHES OF COMPACTED SAND. MINIMUM BURIAL DEPTHS: 36 INCHES FOR UTILITY PIPES, AND 18 INCHES FOR REMEDIATION PIPES. MULTIPLE PIPES: MAINTAIN 1-INCH MINIMUM OF SAND AROUND ALL PIPES.
4. BACKFILL TRENCHES WITH CLEAN SAND. MAXIMUM LOOSE LIFT OF 8 INCHES BEFORE COMPACTION. COMPACT ABOVE PIPE ZONE TO AT LEAST 95% OF MAXIMUM DENSITY AND WITHIN +/- 3% OF OPTIMUM MOISTURE (ASTM D-1557).
5. INSTALL TRACEABLE WARNING TAPE IN ALL TRENCHES AT LEAST 6-INCHES ABOVE HIGHEST PIPE.
6. MATCH SURFACING MATERIALS AND THICKNESS TO SURROUNDING UNLESS NOTED. PRIOR TO ASPHALTING, APPLY TACK COAT TO SURFACES. UPON COMPLETION, APPLY SEAL COAT AND RESTRIPE.
7. ALL PANELS AND METERS SHALL BE MOUNTED AT LEAST 36 INCHES ABOVE GRADE ON UNISTRUT ON 2 FT CENTERS.
8. SUPPORT ALL ABOVE GROUND PIPES WITH UNISTRUT AND SECURE WITH PIPE CLAMPS. 5 FT MAXIMUM SPACING BETWEEN SUPPORTS.
9. PRESSURE TEST ALL PIPING TO A MINIMUM OF 75 PSI PRIOR TO BACKFILLING AND/OR USE.

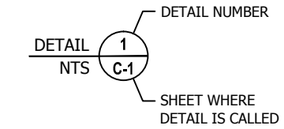
## PLAN SYMBOLS:

- MW-12 — SHALLOW MONITORING WELL
- DC-16 — DEEP MONITORING WELL
- SVE-1 — OPERATING SVE WELL
- VMP-1 — VAPOR MONITORING WELL
- SVE-14 — NEW SVE WELL
- AS-2 — NEW AS WELL
- — X — CHAIN LINK FENCE
- EXISTING ABOVEGROUND SVE PIPE
- EXISTING UNDERGROUND SVE PIPE
- PROPOSED ABOVEGROUND SVE PIPE
- PROPOSED UNDERGROUND SVE PIPE
- PROPOSED ABOVEGROUND AS PIPE
- PROPOSED UNDERGROUND AS PIPE
- APPROXIMATE PROPERTY BOUNDARY
- — E — OVERHEAD ELECTRICAL LINE
- — — E — UNDERGROUND ELECTRICAL LINE
- — T — OVERHEAD TELEPHONE LINE
- — — T — UNDERGROUND TELEPHONE LINE
- — — G — NATURAL GAS LINE
- — — SD — STORM DRAIN
- — — SS — SANITARY SEWER LINE
- — — W — WATER LINE
- XXXXXXXXXX TO BE DEMOLISHED OR DECOMISSIONED

## FILL PATTERNS:

- PAVEMENT
- SAND
- AGGREGATE
- SOIL
- CONCRETE
- BENTONITE CHIPS
- COMPACTED FILL
- CEMENT BENTONITE GROUT

SHEET WHERE DETAIL IS SHOWN:

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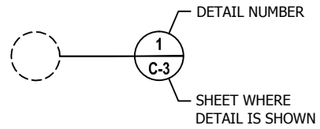


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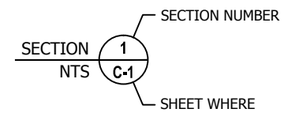


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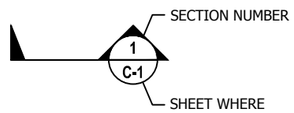


## ABBREVIATIONS:

| | | | |
|---|---|---|---|
| ø | DIAMETER | MVSC | MANHATTAN VILLAGE SHOPPING CENTER |
| ' | FEET | MW | MONITORING WELL |
| " | INCHES | NTS | NOT TO SCALE |
| # | NUMBER | SDMH | STORM DRAIN MANHOLE |
| APPROX | APPROXIMATE | SSMH | SANITARY SEWER MANHOLE |
| AS | AIR SPARGING | SVE | SOIL VAPOR EXTRACTION |
| CB | CATCH BASIN | PCE | TERACHLOROETHENE |
| EL | ELEVATION | PSI | POUNDS PER SQUARE INCH |
| ES | ESTIMATED | PVC | POLYVINYL CHLORIDE |
| FH | FIRE HYDRANT | SCH | SCHEDULE |
| MAX | MAXIMUM | TYP | TYPICAL |
| MIN | MINIMUM | WC | WATER COLUMN |
| MPT | MALE PIPE THREAD | XFMR | TRANSFORMER |

| No. | Date | Revisions | By |
|---|---|---|---|
| 0 | 7/22/14 | Issued for Bid | |

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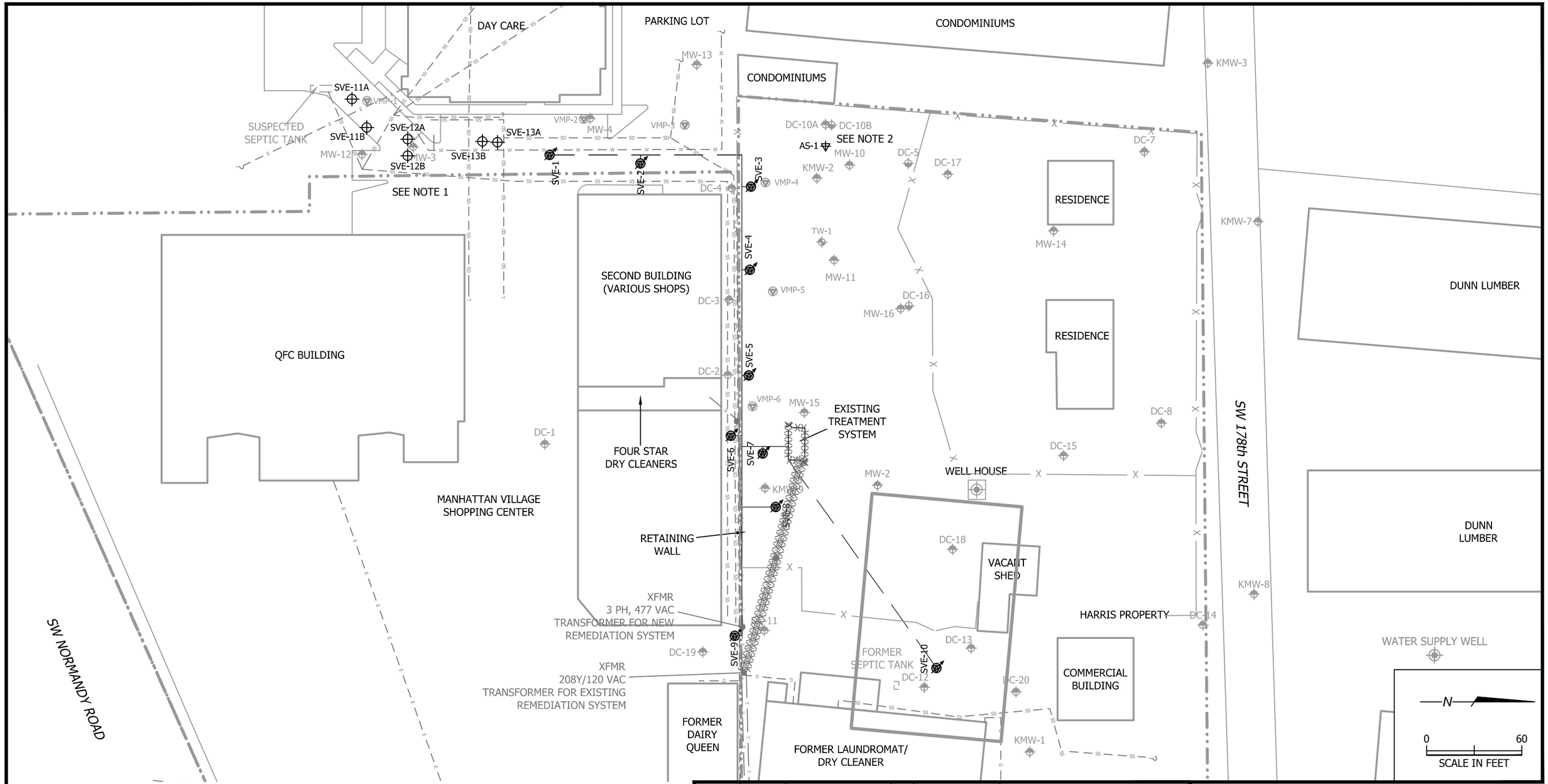
MATTHEW V. DAHL STATE OF WASHINGTON 50366 REGISTERED PROFESSIONAL ENGINEER

PES Environmental, Inc.
Engineering & Environmental Services

**General Notes**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet G-1

| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |
|---|---|---|---|
| 1358.001.01.005 | 1358-00101005_SVE_r1_G1 | BO | 7/14 |




NOTES:

1. EXISTING WELLS SVE-11A, SVE-11B, SVE-12A, SVE-12B, SVE-13A,AND SVE-13B WERE INSTALLED IN NOVEMBER 2013. THESE WELLS ARE NOT CONNECTED TO THE EXISTING SVE SYSTEM AND ARE CLASSIFIED AS NEW WELLS IN THESE PLANS.

2. EXISTING WELL AS-1 WAS INSTALLED IN JUNE 2012. THIS WELL IS NOT CONNECTED TO THE EXISTING REMEDIATION SYSTEM AND IS CLASSIFIED AS A NEW WELL IN THESE PLANS.

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|---|---|---|---|
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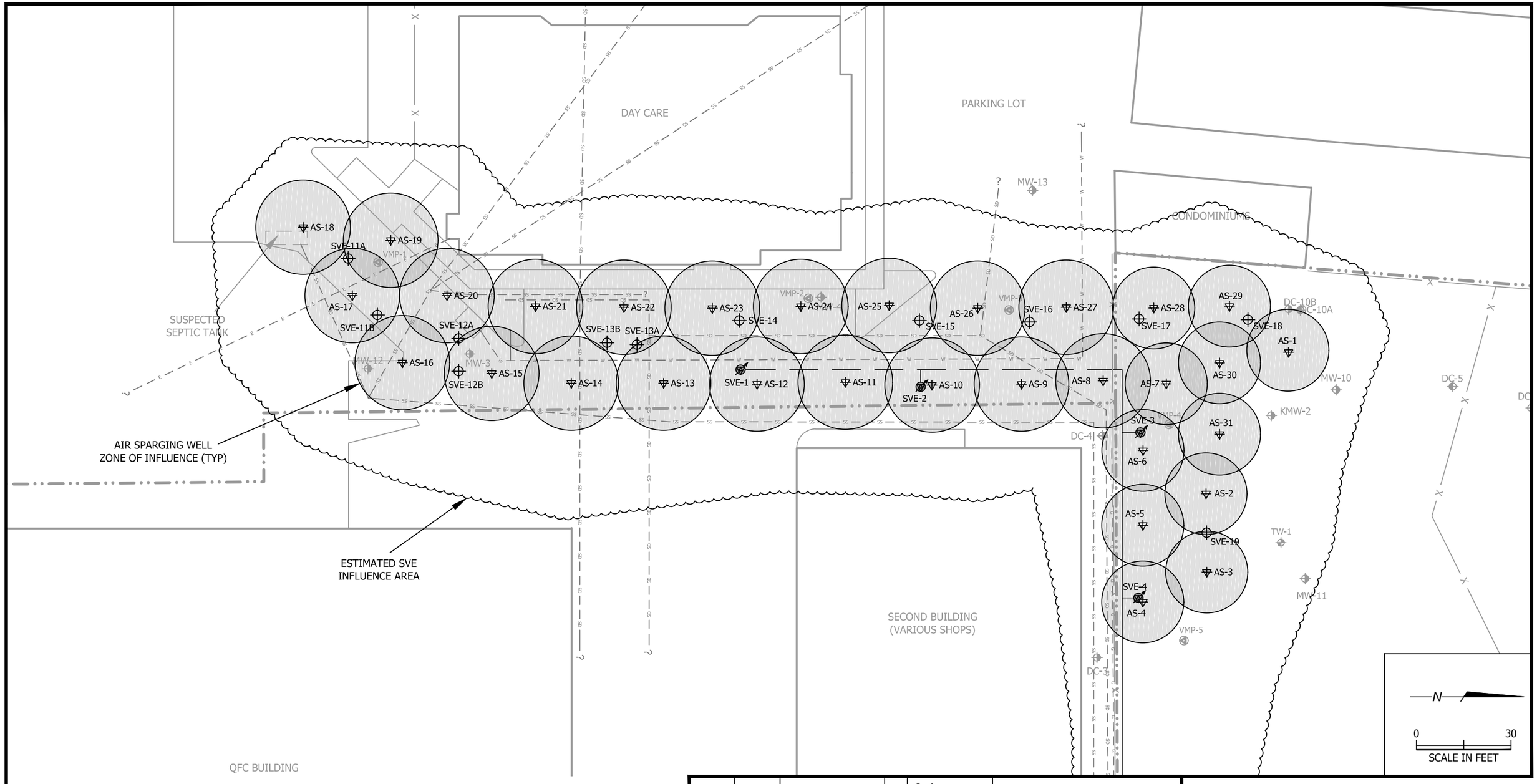
**PES Environmental, Inc.**
Engineering & Environmental Services

**Existing Site Plan**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet C-1

| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |
|---|---|---|---|
| 1358.001.01.005 | 1358-00101005_SVE_r1_C1-C5 | BO | 7/14 |




NOTES:
1. AS WELLS ON HARRIS PROPERTY INCLUDE AN ESTIMATED 13 FT ZONE OF INFLUENCE.
2. AS WELLS ON MVSC PROPERTY INCLUDE AN ESTIMATED 15 FT ZONE OF INFLUENCE.
3. SVE WELLS INCLUDE AN ESTIMATED 40 FT RADIUS OF INFLUENCE. THE COMBINED SVE INFLUENCE AREA INCLUDES ALL 22 OF THE SVE WELLS (SVE-1 THROUGH SVE-19).

| No. | Date | Revisions | By |
|---|---|---|---|
| 0 | 7/22/14 | Issued for Bid | |

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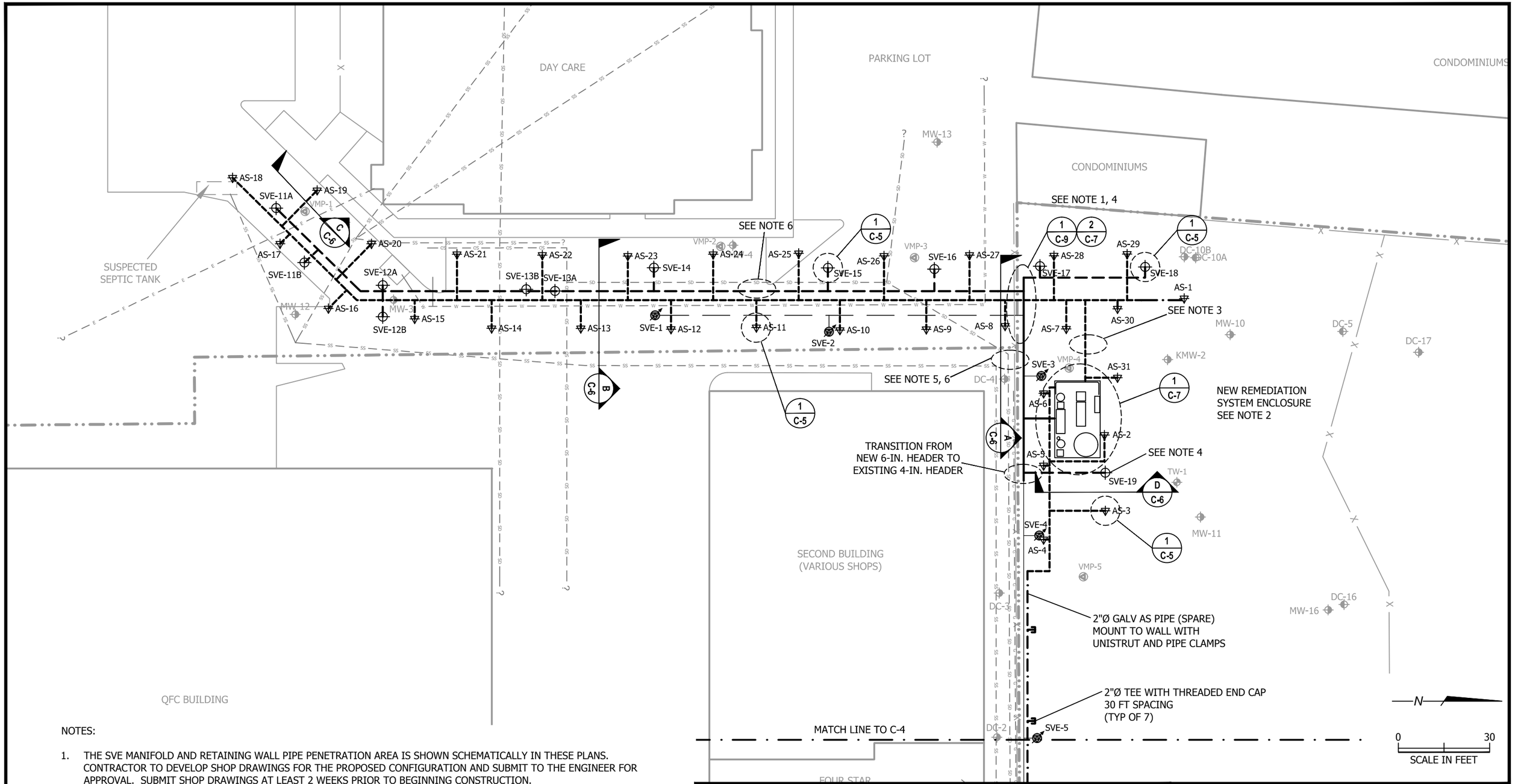
**PES Environmental, Inc.**
Engineering & Environmental Services

**Zone of Influence Layout**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet C-2

| 1358.001.01.005 | 1358-00101005_SVE_r1_C1-C5 | BO | 7/14 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |




NOTES:

1. THE SVE MANIFOLD AND RETAINING WALL PIPE PENETRATION AREA IS SHOWN SCHEMATICALLY IN THESE PLANS. CONTRACTOR TO DEVELOP SHOP DRAWINGS FOR THE PROPOSED CONFIGURATION AND SUBMIT TO THE ENGINEER FOR APPROVAL. SUBMIT SHOP DRAWINGS AT LEAST 2 WEEKS PRIOR TO BEGINNING CONSTRUCTION.
2. SUPPLY 3-PHASE 460 VAC POWER AND TELEPHONE UTILTIES TO THE NEW REMEDIATION SYSTEM ENCLOSURE. PROVIDE STEP DOWN TRANSFORMER FOR 120 VAC CONTROL LOADS AND GFCI OUTLETS.
3. INSTALL INDIVIDUAL LATERAL PIPES TO FLUSH GRADE WELLS IN COMMON TRENCHES WHEREVER POSSIBLE.
4. ROUTE LATERAL PIPES FROM SVE WELLS SVE-17, SVE-18, AND SVE-19 UNDERGROUND TO THE 6-INCH DIAMETER SVE HEADER AT THE RETAINING WALL. INSTALL MONITORING PORTS AND THROTTLING VALVES ON ABOVEGROUND SECTIONS OF LATERAL PIPES PRIOR TO HEADER TIE-IN.
5. SUPPORT ALL ABOVE GROUND PIPES AT 5 FT SPACING (MAX) TO PREVENT PIPE SAGS.
6. SLOPE SVE LATERALS AND HEADERS TO WELLS AT 1 PERCENT SLOPE.

| No. | Date | Revisions | By |
|---|---|---|---|
| 0 | 7/22/14 | Issued for Bid | |

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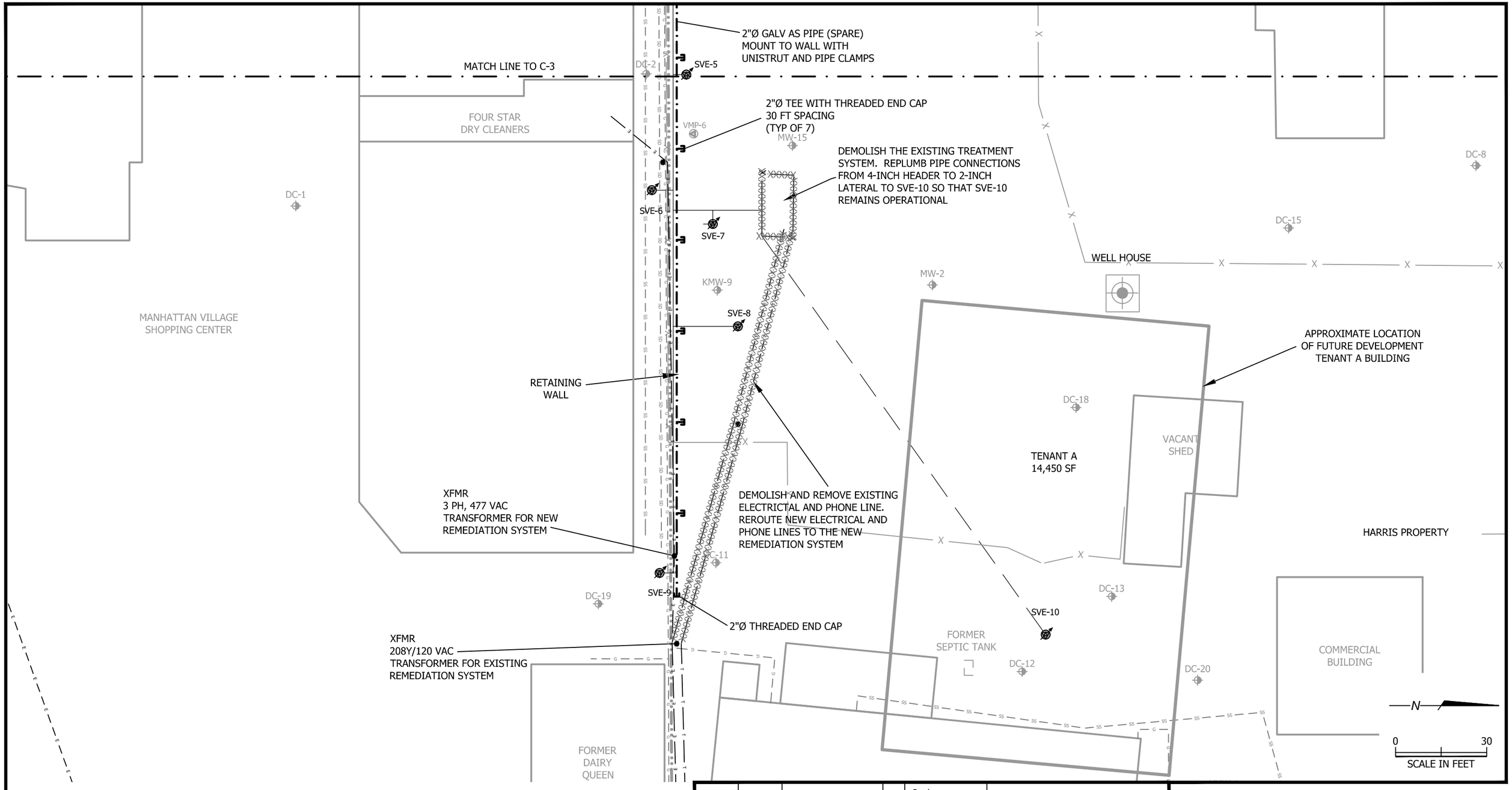
**PES Environmental, Inc.**
Engineering & Environmental Services

**Site Layout - West**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet C-3

| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |
|---|---|---|---|
| 1358.001.01.005 | 1358-00101005_SVE_r1_C1-C5 | BO | 7/14 |




| No. | Date | Revisions | By | |
|---|---|---|---|---|
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| | | | | Designed by: MD |
| | | | | Drawn by: BP |
| | | | | Checked by: BO |
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**PES Environmental, Inc.**
Engineering & Environmental Services

**Site Layout - East**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet
C-4

| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |
|---|---|---|---|
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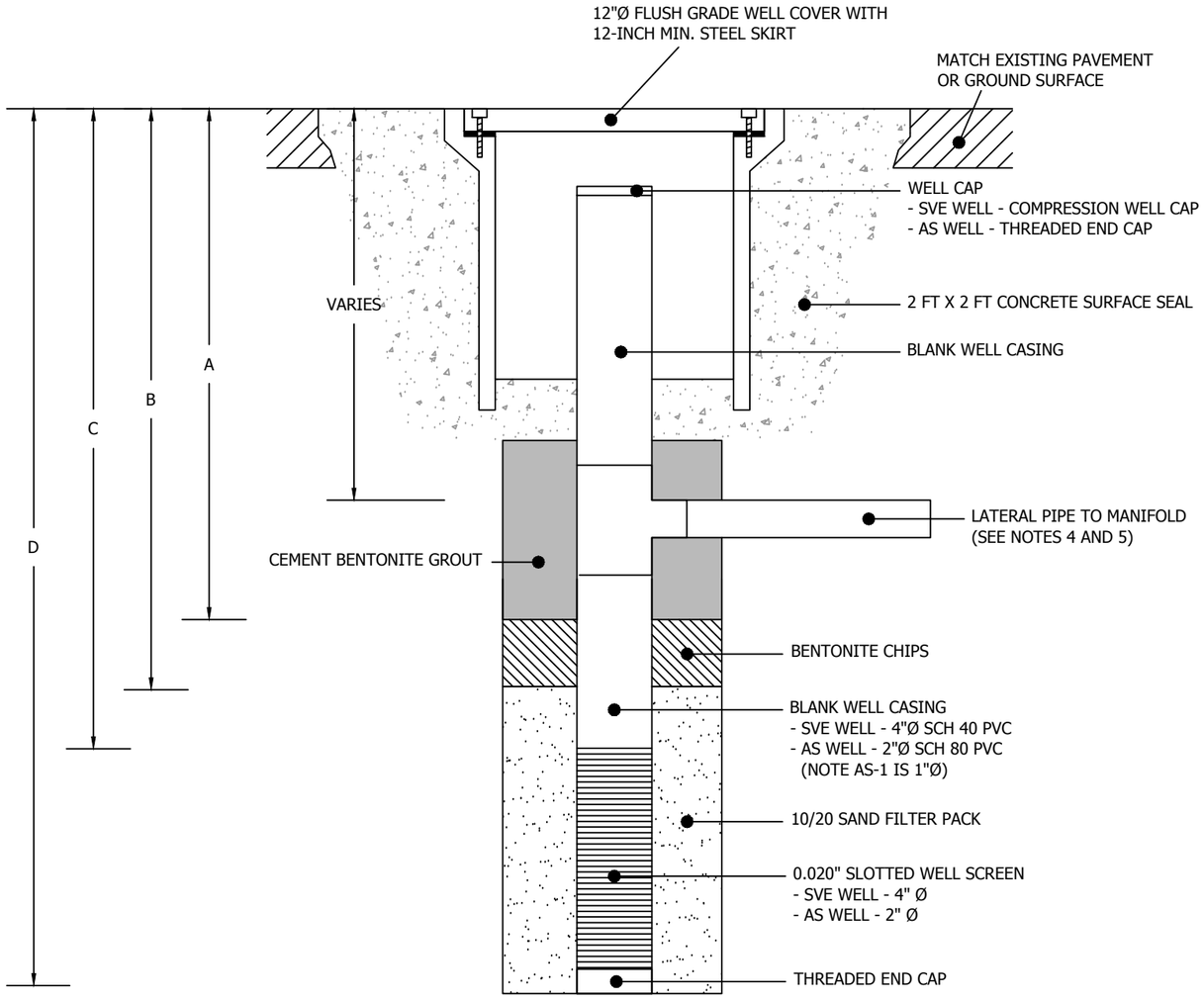


| SVE WELLS (FEET) | | | | |
|---|---|---|---|---|
| WELL | A | B | C | D |
| SVE-11A | 1.5 | 3 | 5 | 20 |
| SVE-11B | 2.5 | 18 | 20 | 35 |
| SVE-12A | 1.5 | 3 | 5 | 20 |
| SVE-12B | 2.5 | 18 | 20 | 35 |
| SVE-13A | 1.5 | 3 | 5 | 20 |
| SVE-13B | 2.5 | 18 | 20 | 35 |
| SVE-14 | 16 | 18 | 20 | 35 |
| SVE-15 | 16 | 18 | 20 | 35 |
| SVE-16 | 16 | 18 | 20 | 35 |
| SVE-17 | 16 | 18 | 20 | 30 |
| SVE-18 | 16 | 18 | 20 | 30 |
| SVE-19 | 16 | 18 | 20 | 30 |

| AS WELLS (FEET) | | | | |
|---|---|---|---|---|
| WELL | A | B | C | D |
| AS-1 | 2.5 | 43.5 | 43.8 | 45.8 |
| AS-2 | 44.5 | 46.5 | 47 | 49 |
| AS-3 | 44.5 | 46.5 | 47 | 49 |
| AS-4 | 44.5 | 46.5 | 47 | 49 |
| AS-5 | 44.5 | 46.5 | 47 | 49 |
| AS-6 | 44.5 | 46.5 | 47 | 49 |
| AS-7 | 44.5 | 46.5 | 47 | 49 |
| AS-8 | 44.5 | 46.5 | 47 | 49 |
| AS-9 | 44.5 | 46.5 | 47 | 49 |
| AS-10 | 44.5 | 46.5 | 47 | 49 |
| AS-11 | 44.5 | 51.5 | 52 | 54 |
| AS-12 | 44.5 | 51.5 | 52 | 54 |
| AS-13 | 44.5 | 51.5 | 52 | 54 |
| AS-14 | 44.5 | 51.5 | 52 | 54 |
| AS-15 | 44.5 | 51.5 | 52 | 54 |
| AS-16 | 44.5 | 51.5 | 52 | 54 |
| AS-17 | 44.5 | 51.5 | 52 | 54 |
| AS-18 | 44.5 | 51.5 | 52 | 54 |
| AS-19 | 44.5 | 51.5 | 52 | 54 |
| AS-20 | 44.5 | 52.5 | 53 | 55 |
| AS-21 | 44.5 | 52.5 | 53 | 55 |
| AS-22 | 44.5 | 52.5 | 53 | 55 |
| AS-23 | 44.5 | 52.5 | 53 | 55 |
| AS-24 | 44.5 | 52.5 | 53 | 55 |
| AS-25 | 44.5 | 52.5 | 53 | 55 |
| AS-26 | 44.5 | 52.5 | 53 | 55 |
| AS-27 | 44.5 | 52.5 | 53 | 55 |
| AS-28 | 44.5 | 52.5 | 53 | 55 |
| AS-29 | 44.5 | 52.5 | 53 | 55 |
| AS-30 | 44.5 | 52.5 | 53 | 55 |
| AS-31 | 44.5 | 52.5 | 53 | 55 |

TYPICAL SVE AND AS WELL CONSTRUCTION DETAIL (1 / C-3)
NTS

NOTES:
1. WELLS SVE-1 THROUGH SVE-13B (16 WELLS) AND AS-1 ARE EXISTING. SVE-1 THROUGH SVE-10 WERE INSTALLED IN 2009 AND MAKE UP THE EXISTING SVE SYSTEM. SVE-11A THROUGH SVE-13 AND AS-1 WERE INSTALLED IN 2013.
2. WELLS SVE-14 THROUGH SVE-19 AND AS-2 THROUGH AS-31 TO BE INSTALLED IN 2014.
3. SEE SVE AND AS WELL TABLES FOR WELL DIMENSIONS.
4. SVE LATERALS: 2"Ø SCH 4O PVC.
5. AS LATERALS: 1"Ø SCH 8O PVC BELOW GROUND, AND 1"Ø SCH 40 GALVANIZED ABOVE GROUND.

| No. | Date | Revisions | By |
|---|---|---|---|
| 0 | 7/22/14 | Issued for Bid | |

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Checked by: BO
Approved by: MD

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**PES Environmental, Inc.**
Engineering & Environmental Services

**Well Construction Details**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet C-5

| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |
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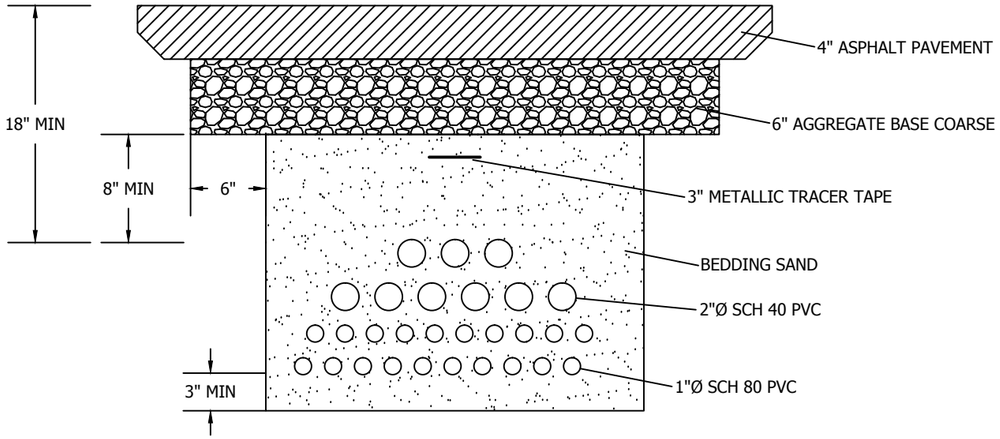
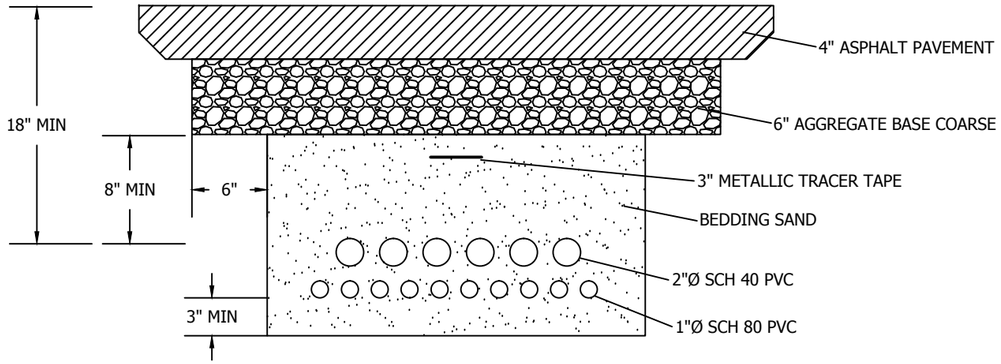


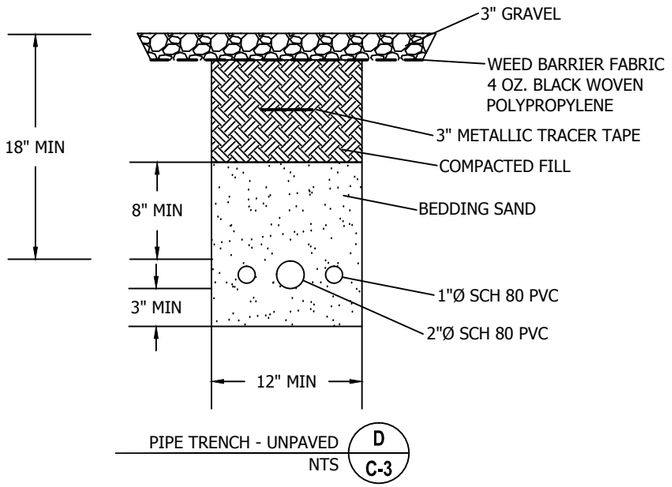

PIPE TRENCH - PAVED A / C-3
NTS



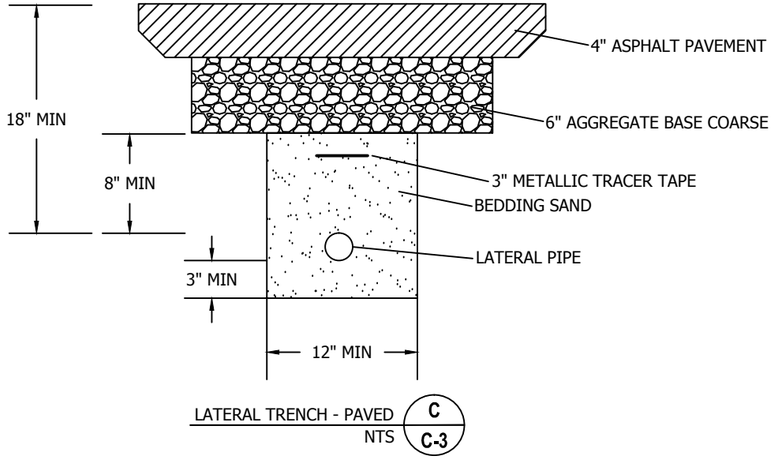

PIPE TRENCH - PAVED B / C-3
NTS

NOTES:

1. TRENCH DEPTH AND WIDTH WILL VARY BY LOCATION.
2. MULTIPLE PIPES: MAINTAIN 1" MIN. SAND AROUND ALL PIPES.
3. BACKFILL TRENCHES WITH CLEAN SAND WITH A MAXIMUM LOOSE LIFT OF 8-INCHES BEFORE COMPACTION.
4. COMPACT ABOVE THE PIPE ZONE TO AT LEAST 95% OF MAXIMUM DENSITY AND WITHIN +/- 3% OF OPTIMUM MOISTURE (ASTM D-1557).
5. AS LATERAL PIPE MATERIALS: SCH 80 PVC BELOW GROUND AND SCH 40 GALV ABOVE GROUND.




PIPE TRENCH - UNPAVED D / C-3
NTS




LATERAL TRENCH - PAVED C / C-3
NTS

| No. | Date | Revisions | By |
|---|---|---|---|
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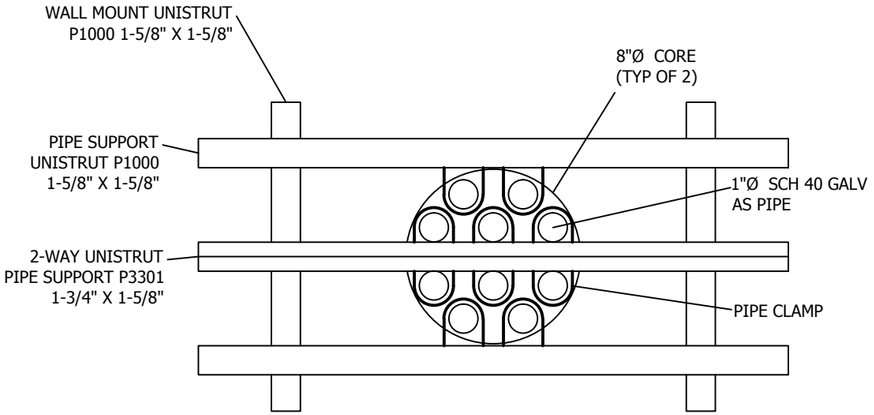
**PES Environmental, Inc.**
Engineering & Environmental Services

**Trench Sections**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet C-6

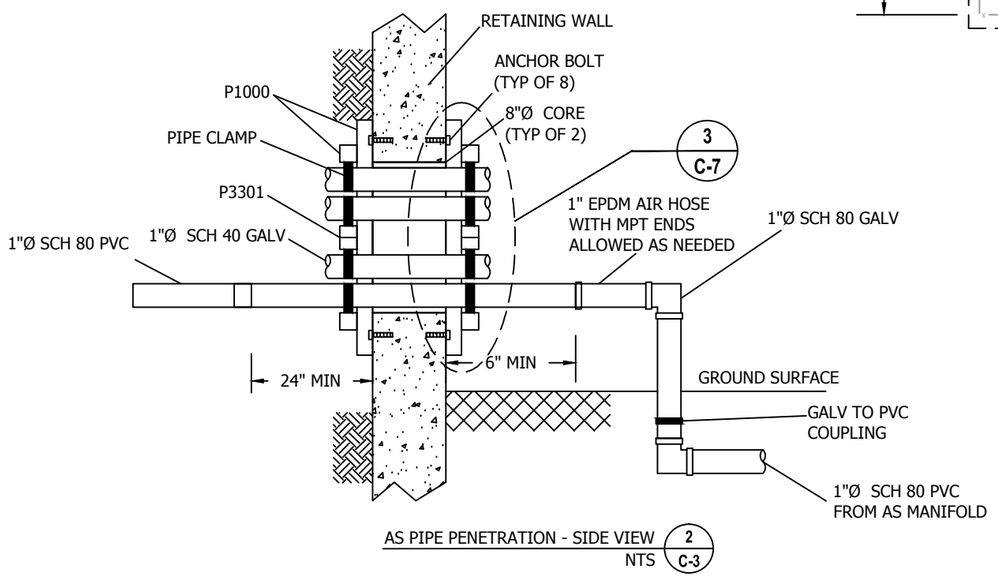
| 1358.001.01.005 | 1358-00101005_SVE_r1_C6 | BO | 7/14 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |



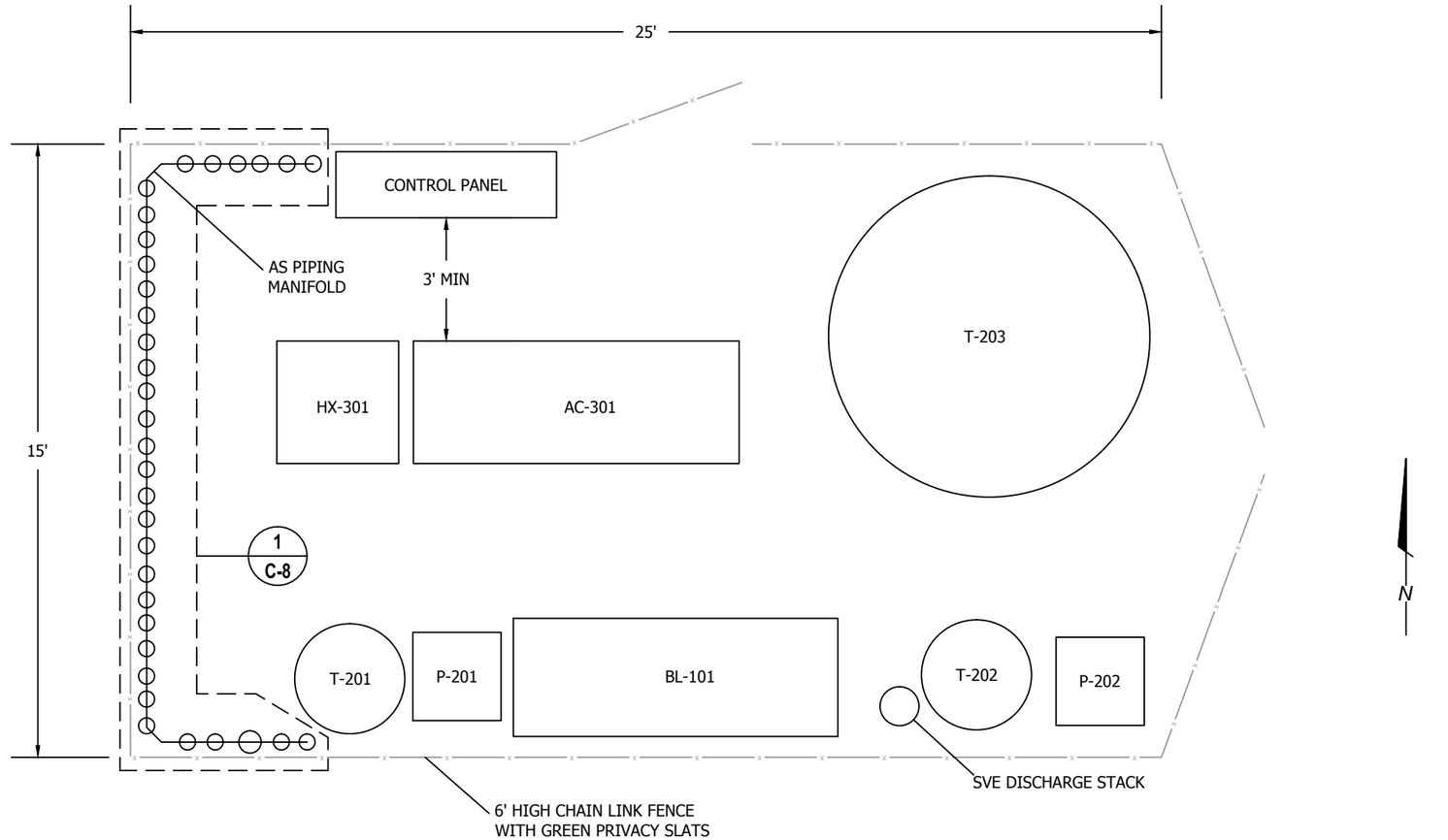

AS PIPE PENETRATION - FRONT VIEW 3/C-7
NTS

NOTES:

1. EXTEND 20 X 1"Φ SCH 40 GALV AS LATERAL PIPES THROUGH TWO 8"Φ CORES CUT INTO THE RETAINING WALL (18" SPACING MIN).
2. SECURE PIPES ON EITHER SIDE OF RETAINING WALL USING UNISTRUT AND PIPE CLAMPS.




AS PIPE PENETRATION - SIDE VIEW 2/C-3
NTS




EQUIPMENT LAYOUT 1/C-3
NTS

NOTE:
EQUIPMENT SIZES AND LAYOUT IS APPROXIMATE. CONTRACTOR TO SUBMIT FINAL EQUIPMENT LAYOUT TO ENGINEER FOR APPROVAL AT LEAST 2 WEEKS PRIOR TO CONSTRUCTION. FINAL LAYOUT TO BE BASED ON ACTUAL EQUIPMENT DIMENSIONS AND SETBACK REQUIREMENTS.

| No. | Date | Revisions | By |
|---|---|---|---|
| 0 | 7/22/14 | Issued for Bid | |

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50366
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PROFESSIONAL ENGINEER

**PES Environmental, Inc.**
Engineering & Environmental Services

**Retaining Wall Penetration and Equipment Layout**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet C-7

| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |
|---|---|---|---|
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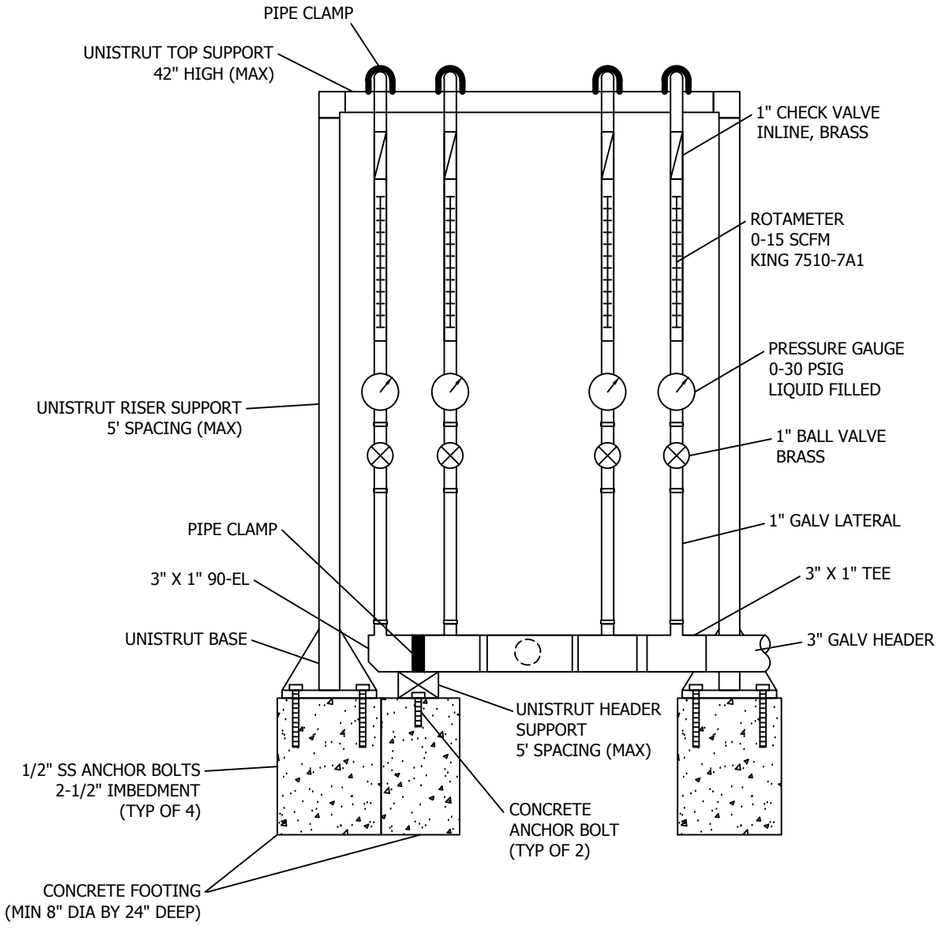
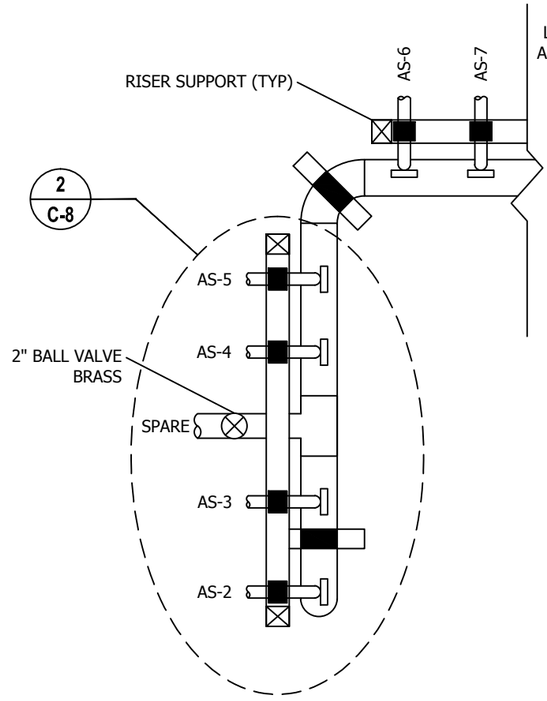
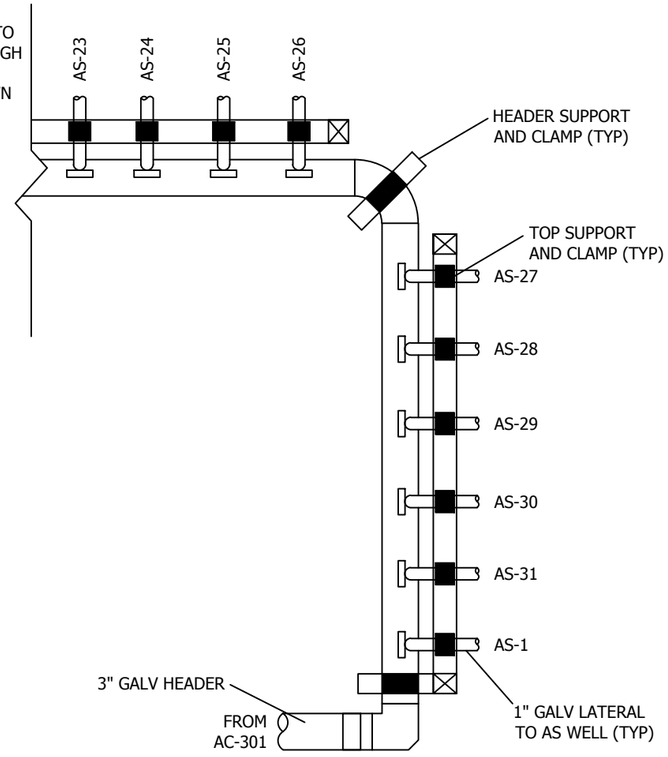



AS MANIFOLD FRONT VIEW 2 / C-8
NTS




NOTES:
1. EITHER THREADED OR WELDED GALVANIZED MANIFOLD IS ACCEPTABLE.
2. TRANSITION FROM GALVANIZED PIPE ABOVE GROUND TO SCH 80 PVC PIPE BELOW GROUND.

AS MANIFOLD TOP VIEW 1 / C-7
NTS

| No. | Date | Revisions | By |
|---|---|---|---|
| 0 | 7/22/14 | Issued for Bid | |

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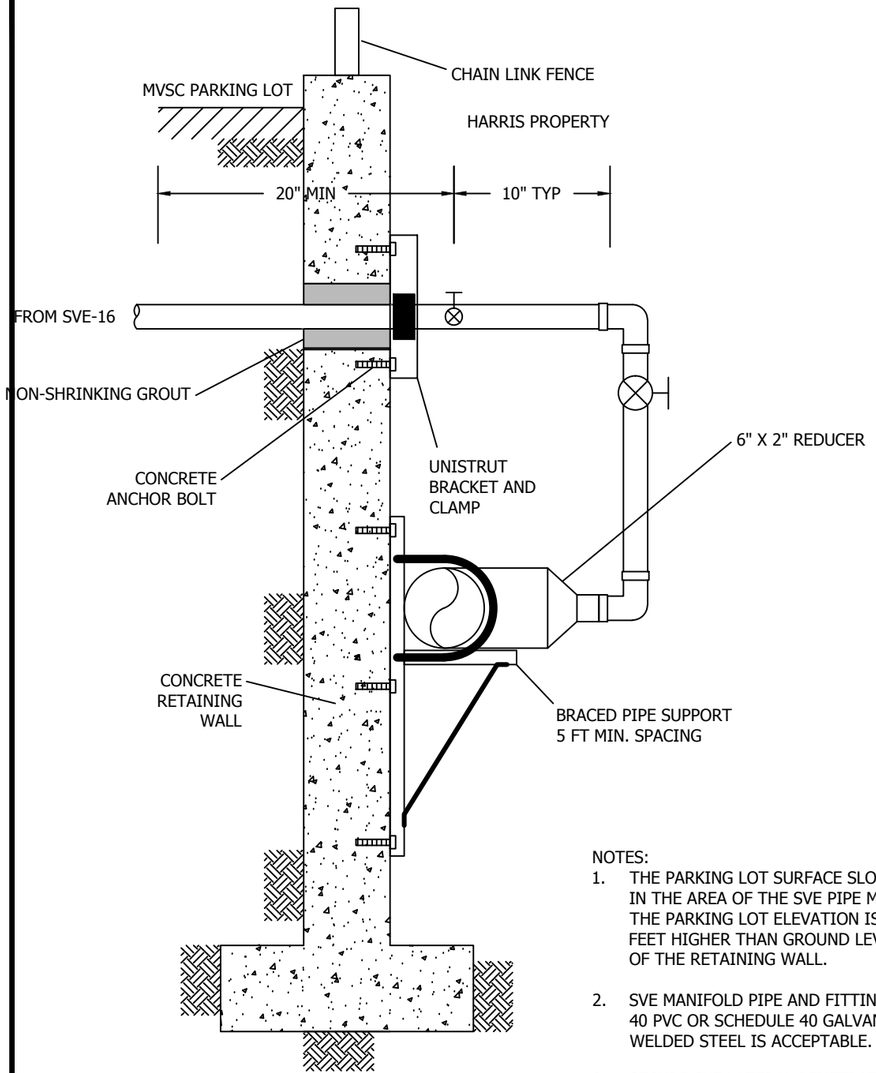
Engineering & Environmental Services

**AS Manifold Details**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet C-8

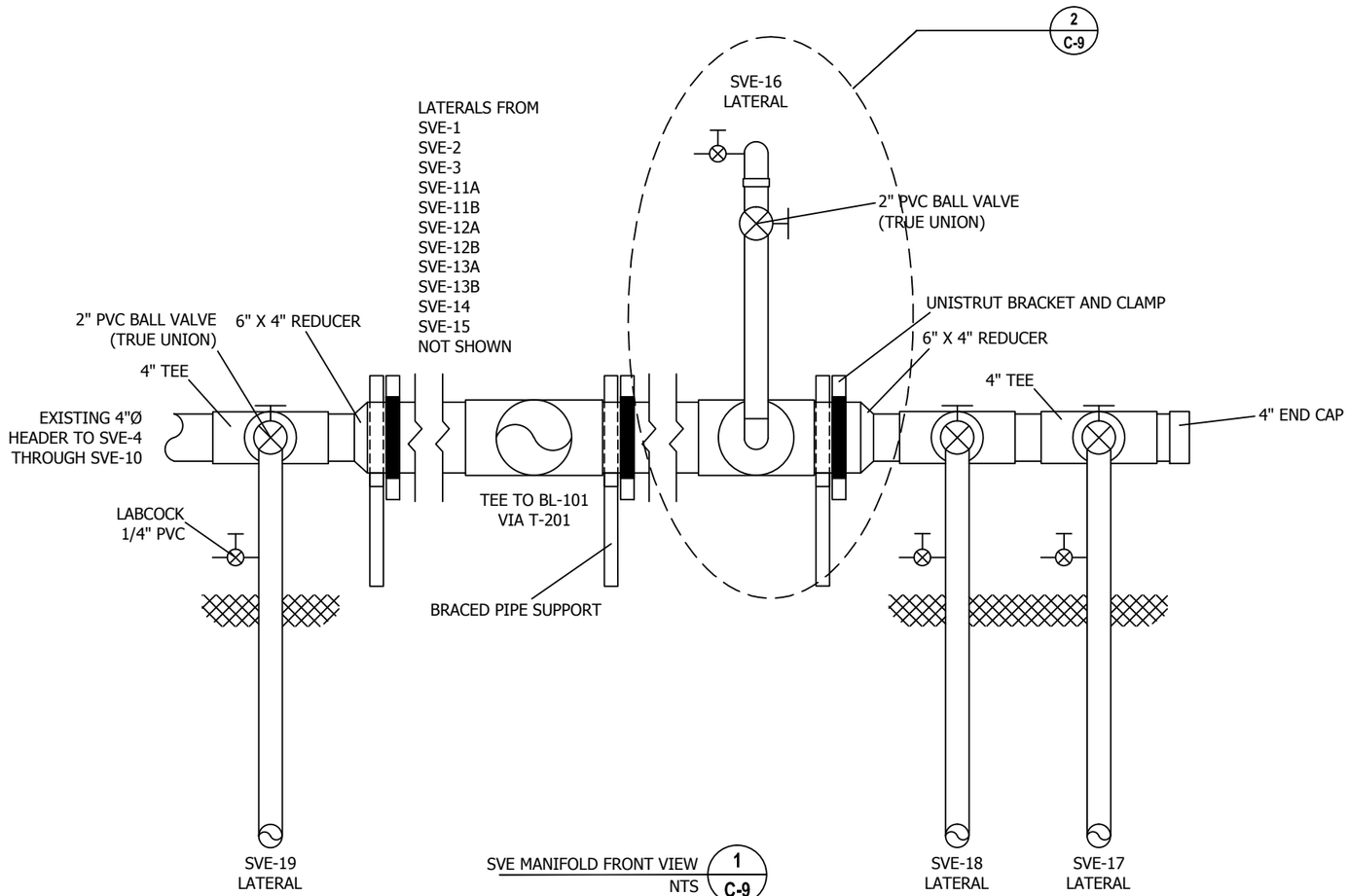
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |
|---|---|---|---|
| 1358.001.01.003 | 1358-00101005_SVE_r1_C7-C9 | BO | 7/14 |




SVE MANIFOLD SIDE VIEW 2 / C-9
NTS

NOTES:

1. THE PARKING LOT SURFACE SLOPES DOWN TO THE WEST IN THE AREA OF THE SVE PIPE MANIFOLD. IN THIS AREA THE PARKING LOT ELEVATION IS APPROXIMATELY 3 TO 5 FEET HIGHER THAN GROUND LEVEL ON THE NORTH SIDE OF THE RETAINING WALL.
2. SVE MANIFOLD PIPE AND FITTING MATERIALS: SCHEDULE 40 PVC OR SCHEDULE 40 GALVANIZED STEEL PIPE. WELDED STEEL IS ACCEPTABLE.
3. SECURE SVE LATERAL PENETRATIONS AND SVE HEADER PIPES TO RETAINING WALL USING UNISTRUT BRACKETS AND CLAMPS.
4. SUPPORT SVE HEADER PIPE USING HORIZONTAL UNISTRUT SUPPORTS WITH DIAGONAL BRACES. 5 FT MIN. SPACING BETWEEN PIPE SUPPORTS.




SVE MANIFOLD FRONT VIEW 1 / C-9
NTS

| No. | Date | Revisions | By |
|---|---|---|---|
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Approved by: MD

MATTHEW V. DAHL STATE OF WASHINGTON 50366 REGISTERED PROFESSIONAL ENGINEER

PES Environmental, Inc.
Engineering & Environmental Services

**SVE Manifold Details**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet C-9

| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |
|---|---|---|---|
| 1358.001.01.003 | 1358-00101005_SVE_r1_C7-C9 | BO | 7/14 |

## VALVE AND PIPING SYMBOLS

- GLOBE VALVE
- GATE VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- TRUE-UNION BALL VALVE
- RELIEF OR SAFETY VALVE
- SELF-CONTAINED PRESSURE REGULATING VALVE
- NEEDLE VALVE
- BALL VALVE
- 3-WAY VALVE
- SAMPLE PORT
- NO NORMALLY OPEN
- NC NORMALLY CLOSED
- LC LOCKED CLOSED
- DAMPER
- DIAPHRAGM VALVE
- ORIFICE VALVE

## GENERAL SYMBOLS

- Y-TYPE STRAINER
- EQUIPMENT DRAIN
- REMOVABLE CAP
- FLANGE
- EXHAUST TO ATMOSPHERE
- REDUCER
- FILTER REDUCER
- UNION
- QUICK DISCONNECT COUPLING
- CAMLOCK COUPLING
- FLEXIBLE HOSE
- EXPANSION JOINT (FLANGED)
- GRAVITY FLOW
- FLOW ORIFICE
- DIAPHRAGM SEAL
- SIGHT GLASS
- VORTEX DAMPER
- CLEAN OUT
- FLEXIBLE COUPLING

## VALVE OPERATOR SYMBOLS

- S SOLENOID
- M MOTOR, ELECTRIC
- DIAPHRAGM (GENERAL)
- P PNEUMATIC
- HAND

## PRIMARY ELEMENT SYMBOLS

- ORIFICE PLATE
- AVERAGING PITOT TUBE
- PROPELLOR OR TURBINE
- VARIABLE AREA
- F FLOW
- FLOAT LEVEL
- P PRESSURE
- M MAGNETIC
- T TOTALIZER

## EQUIPMENT SYMBOLS

- GROUNDWATER PUMP (ELECTRIC)
- CENTRIFUGAL PUMP
- AIR COMPRESSOR
- HEAT EXCHANGER (GAS/GAS)
- HEAT EXCHANGER (GAS/LIQUID)
- VFD VARIABLE FREQUENCY DRIVE
- REGENERATIVE BLOWER OR FAN
- PRODUCT PUMP (PNUEMATIC)
- 55 GALLON DRUM WITHIN 95 GALLON OVERPACK DRUM
- FILTER
- SUMP PUMP WITH LEVEL FLOAT
- METERING PUMP
- POSITIVE DISPLACEMENT BLOWER
- SILENCER
- TANK ADAPTER
- TANK FULL SHUTOFF (TFSO) UNIT
- CONDENSATE TRAP

## GENERAL INSTRUMENT SYMBOLS

| GENERAL INSTRUMENT OR FUNCTION SYMBOLS | FIELD MOUNTED | PRIMARY LOCATION ACCESSIBLE TO OPERATOR | AUXILLARY LOCATION ACCESSIBLE TO OPERATOR | NORMALLY INACCESSIBLE OR BEHIND THE PANEL |
|---|---|---|---|---|
| DISCRETE INSTRUMENTS | ○ | ⊖ | ⊖ | ⊖ |
| SHARED DISPLAY, SHARED CONTROL | □ | ▭ | ▭ | ▭ |
| COMPUTER FUNCTION | ⬡ | ⬡ | ⬡ | ⬡ |
| PROGRAMMABLE LOGIC CONTROL | ◇ | ◇ | ◇ | ◇ |

- IN-LINE DEVICE
- DIRECT CONNECTION TO PROCESS
- PILOT LAMP G = GREEN, R = RED
- 120 VAC ELECTRICAL SERVICE
- I# INTERLOCK - # INDICATES INTERLOCK NUMBER
- HOA HAND-OFF-AUTO
- HOR HAND-OFF-REMOTE
- I-O ON-OFF

## PLC INPUT/OUTPUT SYMBOLS

- DISCRETE INPUT
- DISCRETE OUTPUT
- ANALOG INPUT
- ANALOG OUTPUT

## LINE SYMBOLS

- PROCESS
- COMPRESSED AIR
- INTRINSICALLY SAFE SIGNAL
- ELECTRICAL SIGNAL
- FLEXIBLE TUBING
- SPARGER LINE
- SOFTWARE OR DATALINK

- FROM REFERENCED DRAWING OR EQUIPMENT
- TO REFERENCED DRAWING OR EQUIPMENT
- 1 / R-2 DETAIL LETTER OR NUMBER / DRAWING OF REFERENCE

## PROCESS LINE ABBREVIATIONS

| | |
|---|---|
| AIR | COMPRESSED AIR |
| CHEM | CHEMICAL ADDITION |
| COND | CONDENSATE |
| GW | GROUNDWATER |
| PROD | PRODUCT (LNAPL or DNAPL) |
| VAP | VAPOR |
| VENT | AIR VENT |

## PIPING MATERIAL IDENTIFICATION

| | |
|---|---|
| CPVC | CHLORINATED POLYVINYL CHLORIDE |
| CSP | CARBON STEEL PIPE |
| GALV | GALVANIZED CARBON STEEL PIPE |
| HDPE | HIGH DENSITY POLYETHYLENE |
| HSE | HOSE |
| SSP | STAINLESS STEEL PIPE |
| SST | STAINLESS STEEL TUBING |
| PE | POLYETHYLENE |
| PVC | POLYVINYL CHLORIDE |
| T | TUBING |

## EQUIPMENT IDENTIFICATION

| | |
|---|---|
| AD | AUTODIALER |
| AP | ANALYSIS/SAMPLE PORT |
| AC | AIR COMPRESSOR |
| BA | BOTTLED AIR |
| BL | BLOWER |
| CFP | CHEMICAL FEED PUMP |
| CP | CONTROL PANEL |
| FIL | FILTER |
| HEX | HEAT EXCHANGER |
| HMI | HUMAN MACHINE INTERFACE |
| HV | HAND VALVE |
| M | MOTOR |
| NPT | NATIONAL PIPE THREAD |
| P | PUMP |
| PLC | PROGRAMMABLE LOGIC CONTROLLER |
| RCP | REMOTE CONTROL PANEL |
| S | STRAINER OR VALVE |
| SG | VAPOR EXTRACTION WELL |
| SIL | SILENCER |
| SP | SAMPLE PORT |
| SVE | SOIL VAPOR EXTRACTION |
| T | TUBING |
| TFSO | TANK FULL SHUTOFF |
| VAC | VOLTAGE (ALTERNATING CURRENT) |
| VDC | VOLTAGE (DIRECT CURRENT) |
| VENT | PNEUMATIC PUMP AIR VENT |
| VFD | VARIABLE FREQUENCY DRIVE |
| XV | CHECK VALVE |

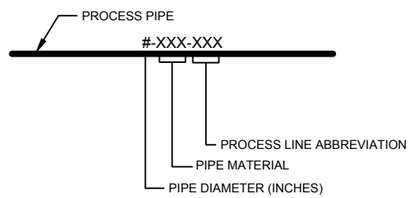
## VALVE AND INSTRUMENT IDENTIFICATION SYMBOLS

| | FIRST LETTER | | SUCCEEDING LETTER | | |
|---|---|---|---|---|---|
| | MEASURED OR INITIATING VARIABLE | MODIFIER | READOUT OR PASSIVE FUNCTION | OUTPUT FUNCTION | MODIFIER |
| | | | | | |
| A | ANALYSIS | | ALARM | | |
| B | BURNER FLAME | | | | |
| C | CONTROL | | | CONTROLLER | CLOSED |
| D | DENSITY (SP. GR.) | DIFFERENTIAL | DAMPER | | |
| E | VOLTAGE | | PRIMARY ELEMENT | | |
| F | FLOW RATE | RATIO | | | |
| G | GAUGING (DIMENSIONAL) | | GLASS | | |
| H | HAND (MANUAL) | | | | HIGH |
| I | CURRENT | | INDICATOR | | |
| J | POWER | SCAN | | | |
| K | TIME OR SCHEDULE | | | CONTROL STATION | |
| L | LEVEL | | LIGHT (PILOT) | | LOW |
| M | MOISTURE OR HUMIDITY | MOMENTARY | | | MIDDLE |
| N | | | | | |
| O | | | ORIFICE | | OPEN |
| P | PRESSURE OR VACUUM | RELIEF | POINT (TEST) | | |
| Q | QUANT. OR EVENT | INTEGRATE | | | |
| R | RADIATION | | RECORD OR PRINT | | RELIEF |
| S | SPEED/FREQUENCY | SAFETY | | SWITCH/SOLENOID | |
| T | TEMPERATURE | | | TRANSMITTER | TRANSDUCER |
| U | MULTIVARIABLE | | MULTIFUNCTION | | |
| V | VISCOSITY | | | VALVE | |
| W | WEIGHT | | WELL | | |
| X | POSITION | | UNCLASSIFIED | | |
| Y | | | | RELAY OR COMPUTE | |
| Z | POSITION | | | DRIVE, ACTUATE | |
| | | | | | |

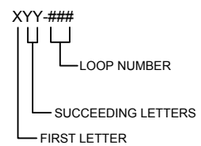
## GENERAL NOTES:

1. DRAWINGS ARE DIAGRAMMATIC AND CANNOT SHOW ALL DETAILS. CONTRACTOR TO PROVIDE AND INSTALL ALL FITTINGS FOR A COMPLETE AND OPERABLE SYSTEM.
2. COMPONENTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.
3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS.
4. REFER TO TECHNICAL SPECIFICATIONS FOR ADDTIONAL REQUIREMENTS. IN THE EVENT OF ANY DISCREPANCIES BETWEEN THE DRAWINGS AND THE SPECIFICATIONS, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND MOST STRINGENT SHALL APPLY.
5. VALVES SHALL BE ORIENTED FOR OPTIMUM ACCESSIBILITY AND OPERABILITY. COMPONENTS SHALL BE INSTALLED WITH SUFFICIENT SPACE FOR MAINTENANCE AND REPAIRS.
6. FLOW METERS, GAUGES AND OHER INSTRUMENTATION SHALL NOT BE SUBJECT TO PRESSURE TESTING UNLESS SPECIFICALLY ALLOWED BY MANUFACTURER.
7. UNLESS OTHERWISE SPECIFIED BY MANUFACTURER, FLOW INSTRUMENTS SHALL BE INSTALLED A MINIMUM OF 10 PIPE DIAMETERS UPSTREAM AND 5 PIPE DIAMETERS DOWNSTREAM FROM ANY FITTING, VALVE, OR OTHER INSTRUMENT.
8. QUICK CONNECT HOSES SHALL BE COLOR-CODED AND EQUIPPED WITH BRASS NON-INTERCHANGEABLE, DOUBLE SHUTOFF QUICK CONNECTS.

## PROCESS PIPING IDENTIFICATION




## VALVE AND INSTRUMENT IDENTIFICATION




| No. | Date | Revisions | By |
|---|---|---|---|
| 0 | 7/22/14 | Issued for Bid | |

Scale: AS NOTED

Designed by: MD

Drawn by: BP

Checked by: BO

Approved by: MD

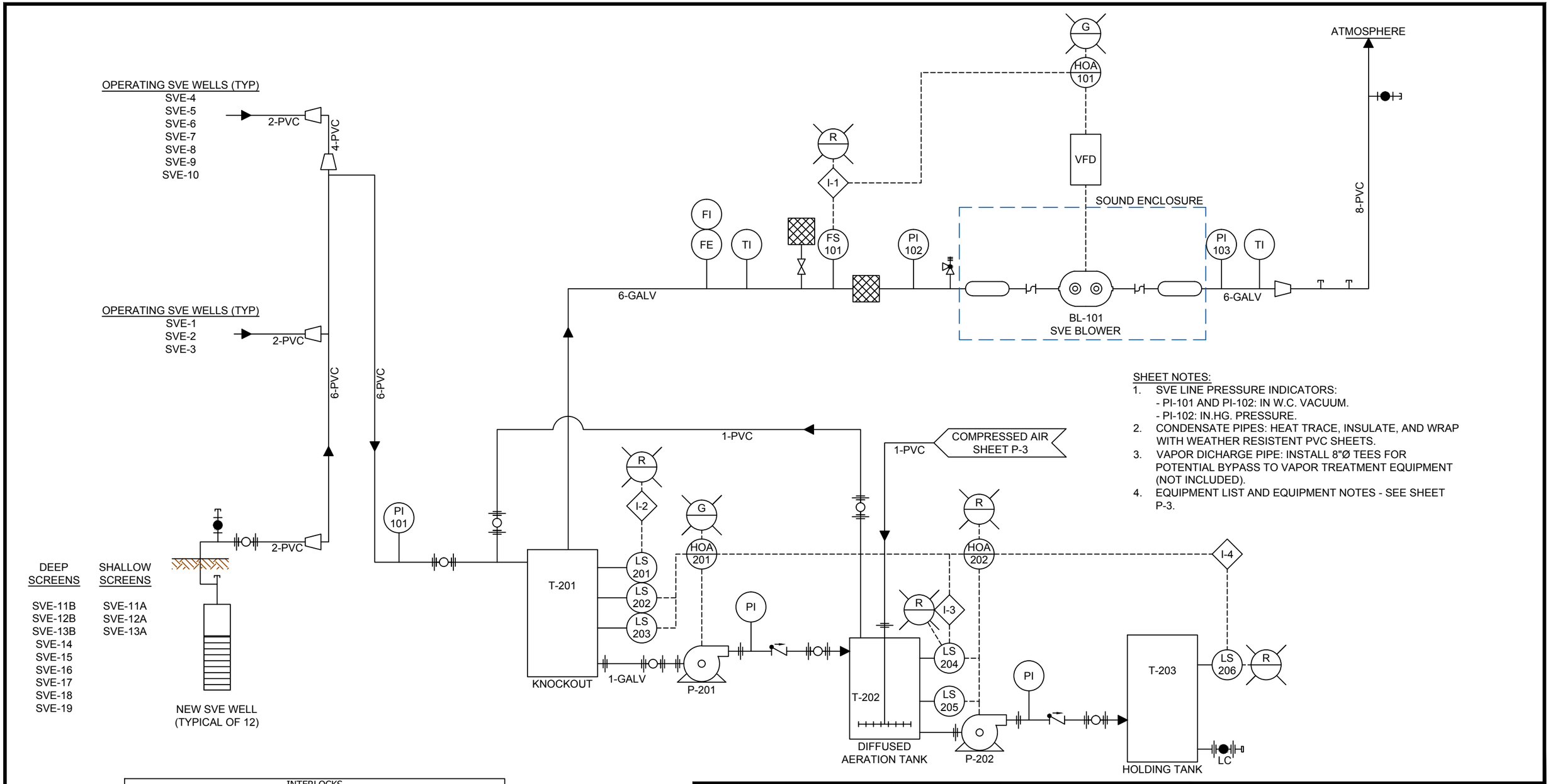
MATTHEW V. DAHL STATE OF WASHINGTON 50366 REGISTERED PROFESSIONAL ENGINEER

**PES Environmental, Inc.**
Engineering & Environmental Services

**Process and Instrumentation Notes**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet P-1

| 1358.001.01.005 | 1358-00101005_SVE_r1_P1-P3 | BO | 7/14 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |




SHEET NOTES:

1. SVE LINE PRESSURE INDICATORS:
   - PI-101 AND PI-102: IN W.C. VACUUM.
   - PI-102: IN.HG. PRESSURE.
2. CONDENSATE PIPES: HEAT TRACE, INSULATE, AND WRAP WITH WEATHER RESISTENT PVC SHEETS.
3. VAPOR DICHARGE PIPE: INSTALL 8"Ø TEES FOR POTENTIAL BYPASS TO VAPOR TREATMENT EQUIPMENT (NOT INCLUDED).
4. EQUIPMENT LIST AND EQUIPMENT NOTES - SEE SHEET P-3.

| INTERLOCKS | |
|---|---|
| I-1 | BL-101 (AUTO) AND FS-101: ENABLES AC-301 (AUTO) |
| I-2 | LS-201 DISABLES P-201 & BL-101 (AUTO) |
| I-3 | LS-204 DISABLES P-201 & P-202 (AUTO) |
| I-4 | LS-206 DISABLES P-201 & P-202 (AUTO) |

| ALARMS | |
|---|---|
| A-1 | LOW FLOW WHEN BL-101 IN AUTO |
| A-2 | LOW FLOW WHEN AC-301 IN AUTO (ALERT ONLY) |
| A-3 | HIGH LEVEL IN T-201 |
| A-4 | HIGH LEVEL IN T-202 |
| A-5 | HIGH LEVEL IN T-203 |

| No. | Date | Revisions | By |
|---|---|---|---|
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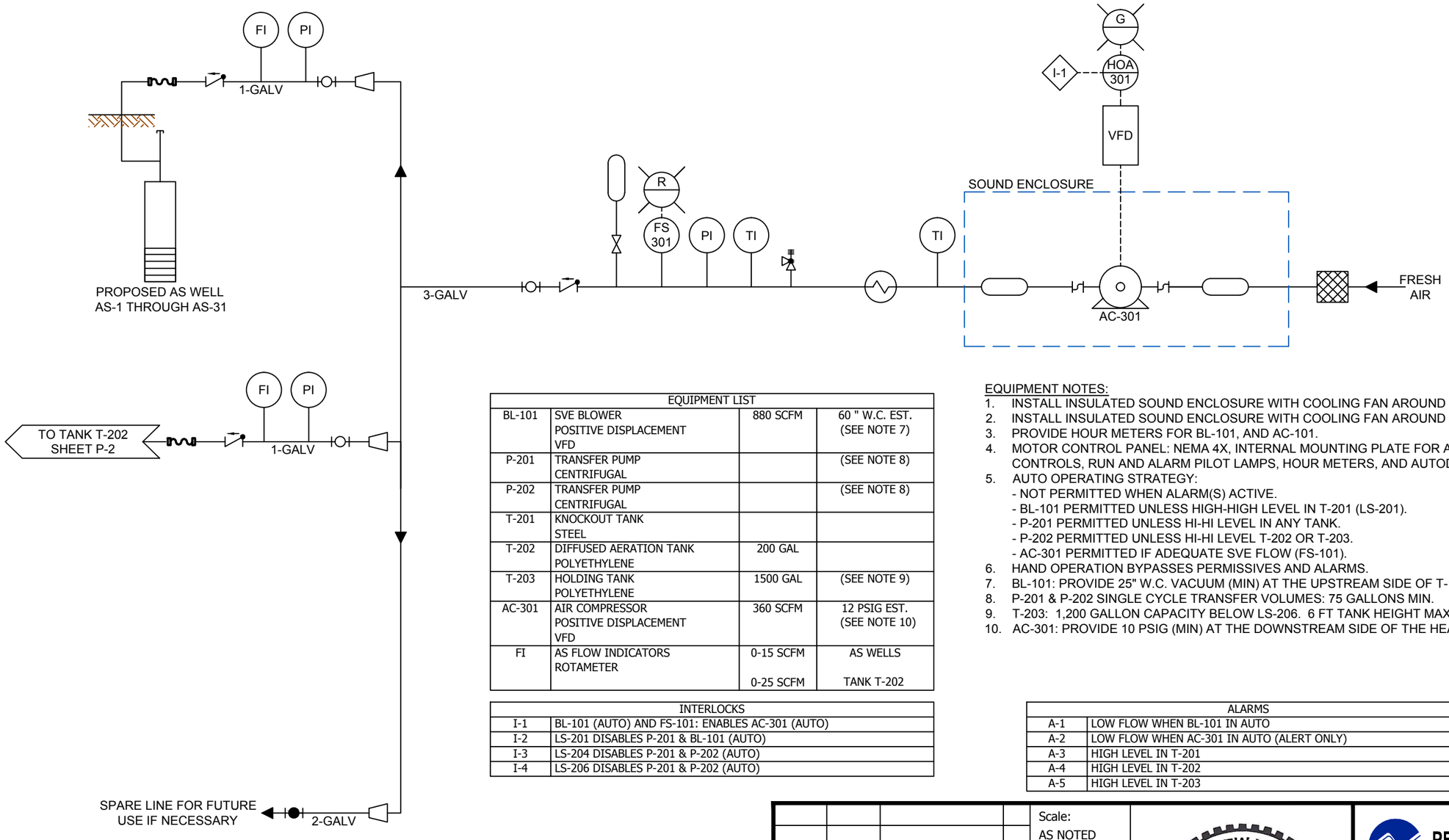
**PES Environmental, Inc.**
Engineering & Environmental Services

**Process and Instrumentation Diagram**
**SVE System**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet P-2

| 1358.001.01.005 | 1358-00101005_SVE_r1_P1-P3 | BO | 7/14 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |




| EQUIPMENT LIST | | | |
|---|---|---|---|
| BL-101 | SVE BLOWER<br>POSITIVE DISPLACEMENT<br>VFD | 880 SCFM | 60 " W.C. EST.<br>(SEE NOTE 7) |
| P-201 | TRANSFER PUMP<br>CENTRIFUGAL | | (SEE NOTE 8) |
| P-202 | TRANSFER PUMP<br>CENTRIFUGAL | | (SEE NOTE 8) |
| T-201 | KNOCKOUT TANK<br>STEEL | | |
| T-202 | DIFFUSED AERATION TANK<br>POLYETHYLENE | 200 GAL | |
| T-203 | HOLDING TANK<br>POLYETHYLENE | 1500 GAL | (SEE NOTE 9) |
| AC-301 | AIR COMPRESSOR<br>POSITIVE DISPLACEMENT<br>VFD | 360 SCFM | 12 PSIG EST.<br>(SEE NOTE 10) |
| FI | AS FLOW INDICATORS<br>ROTAMETER | 0-15 SCFM<br><br>0-25 SCFM | AS WELLS<br><br>TANK T-202 |

| INTERLOCKS | |
|---|---|
| I-1 | BL-101 (AUTO) AND FS-101: ENABLES AC-301 (AUTO) |
| I-2 | LS-201 DISABLES P-201 & BL-101 (AUTO) |
| I-3 | LS-204 DISABLES P-201 & P-202 (AUTO) |
| I-4 | LS-206 DISABLES P-201 & P-202 (AUTO) |

EQUIPMENT NOTES:

1. INSTALL INSULATED SOUND ENCLOSURE WITH COOLING FAN AROUND BL-101. EXTERIOR 65 DB.
2. INSTALL INSULATED SOUND ENCLOSURE WITH COOLING FAN AROUND AC-101. EXTERIOR 65 DB.
3. PROVIDE HOUR METERS FOR BL-101, AND AC-101.
4. MOTOR CONTROL PANEL: NEMA 4X, INTERNAL MOUNTING PLATE FOR ACCESS TO MOTOR CONTROLS, RUN AND ALARM PILOT LAMPS, HOUR METERS, AND AUTODIALER (ALARMS).
5. AUTO OPERATING STRATEGY:
   - NOT PERMITTED WHEN ALARM(S) ACTIVE.
   - BL-101 PERMITTED UNLESS HIGH-HIGH LEVEL IN T-201 (LS-201).
   - P-201 PERMITTED UNLESS HI-HI LEVEL IN ANY TANK.
   - P-202 PERMITTED UNLESS HI-HI LEVEL T-202 OR T-203.
   - AC-301 PERMITTED IF ADEQUATE SVE FLOW (FS-101).
6. HAND OPERATION BYPASSES PERMISSIVES AND ALARMS.
7. BL-101: PROVIDE 25" W.C. VACUUM (MIN) AT THE UPSTREAM SIDE OF T-101.
8. P-201 & P-202 SINGLE CYCLE TRANSFER VOLUMES: 75 GALLONS MIN.
9. T-203: 1,200 GALLON CAPACITY BELOW LS-206. 6 FT TANK HEIGHT MAX.
10. AC-301: PROVIDE 10 PSIG (MIN) AT THE DOWNSTREAM SIDE OF THE HEAT EXCHANGER.

| ALARMS | |
|---|---|
| A-1 | LOW FLOW WHEN BL-101 IN AUTO |
| A-2 | LOW FLOW WHEN AC-301 IN AUTO (ALERT ONLY) |
| A-3 | HIGH LEVEL IN T-201 |
| A-4 | HIGH LEVEL IN T-202 |
| A-5 | HIGH LEVEL IN T-203 |

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**PES Environmental, Inc.**
Engineering & Environmental Services

**Process and Instrumentation Diagram**
**AS System**
Manhattan Village/Harris Properties
17817, 17825, and 17835 1st Avenue South
Normandy Park, Washington

Sheet
P-3

| 1358.001.01.005 | 1358-00101005_SVE_r1_P1-P3 | BO | 7/14 |
|---|---|---|---|
| JOB NUMBER | DRAWING NUMBER | REVIEWED BY | DATE |

# ATTACHMENT C

# CALCULATIONS

PES Environmental, Inc.
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| | |
|---|---|
| SHEET | OF |
| JOB NO. | 1358.001.01 |
| FILE NAME | |
| PROJECT Muse/Harris AS/SVE Design | COMPUTED BY MWO DATE 4/2/2014 |
| SUBJECT Condensate Generation | CHECKED BY DATE |

**Problem:** Estimate SVE condensate accumulation in moisture knockout

**Assumptions:**
1) Temp. soil vapors = 54°F (field data)
2) Temp. Avg. Ambient Air = 40°F (JAN & DEC Avg. DAILY TEMP)
   SOURCE: NWS SEATAC 1948-2010
3) Water vapor content in soil vapor: Same as air @ same Temp. & pressure.
4) Soil vapors @ 100% RH.
5) SVE flow rate = 880 scfm

**Calculation:**

$$V_{COND} = \frac{(Hs_1)(\rho_{a_1}) - (Hs_2)(\rho_{a_2})}{\rho_{W_2}} \times Q_{SVE}$$

Where: Hs = Saturation Humidity
$\rho_a$ = Density air
$\rho_W$ = Density Water
$Q_{SVE}$ = SVE Flow

| Temp (°F) | Hs ($\frac{lb_W}{lb_A}$) | $\rho_a$ ($lb_a/ft^3$) | $\rho_W$ ($lb_W/gal$) |
|---|---|---|---|
| 54°F | $8.94 \times 10^{-3}$ | 0.0772 | 8.334 |
| 40°F | $5.21 \times 10^{-3}$ | 0.0794 | 8.336 |

Source: Chemical Engineers Handbook 4th ed. Page 15-6 McGraw Hill.

$V_1$ (Initial Water Content @ 54°F) $= 8.94 \times 10^{-3}\ lb_W/lb_a \times 0.0772\ \frac{lb_a}{ft^3} = 6.9 \times 10^{-4}\ \frac{lb_W}{ft^3}$

$V_2$ (final water content @ 40°F) $= 5.21 \times 10^{-3} \times 0.0794 = 4.1 \times 10^{-4}$

$\Delta = 2.8 \times 10^{-4}\ lb_W/ft^3$

$$V_{COND} = \left(2.8 \times 10^{-4}\ \frac{lb_W}{ft^3_A}\right)\left(880\ \frac{ft^3_A}{min}\right)\left(\frac{1}{8.336\ lb_W/gal}\right) = 0.0295\ gpm$$

$$0.0295\ gpm \times \frac{1440\ min}{day} = \underline{\underline{42.5\ gal/day}}$$

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| | |
|---|---|
| SHEET | 1 OF 4 |
| JOB NO. | 1358.001.01 |
| FILE NAME | |
| PROJECT | MVSC/HARRIS |
| COMPUTED BY | MM DATE 4/2/2014 |
| SUBJECT | PIPE HEAD LOSS - AS/SVE |
| CHECKED BY | DATE |

Problem: Estimate head loss in AS piping — longest run

Assumptions: 1) $Q_{LATERAL}$ = 10 scfm

2) $Q_{MANIFOLD}$ = 350 scfm (max if add extra AS wells)

3) Temp = 100°F (compressed air after heat exchanger - summer)

4) LATERAL PIPE: 1"ϕ SCH 40 GALV (ID = 1.049") or 1"ϕ SCH80 PVC (ID = 0.957") * use for calculation

5) Header pipe 3"ϕ SCH 40 GALV (ID = 3.068")

6) Pipe Roughness factor (ϵ) $\epsilon_{plastic} = 0.000005$ ft

$\epsilon_{GALV} = 0.00015$ ft

7) Kinematic Viscosity (ν) = $Air_{100F} = 1.80 \times 10^{-4}$ ft²/s

Step ① Determine $H_L$ per 100 ft pipe

$$H_L = \left(f\right)\left(\frac{L}{D}\right)\left(\frac{V^2}{2g}\right)$$

Where: $$f = \frac{1.325}{\left[\ln\left(\frac{\epsilon}{3.7D} + \frac{5.74}{Re^{0.9}}\right)\right]^2}$$

SOURCE: Fluid Mechanics, 8th ed. Page 220. 1985 Streeter, V.L & Wylie, E.B

NOTE: Approximates w/in 1% of Colebrook Eq. when $10^{-6} \leq \frac{\epsilon}{D} \leq 10^{-2}$ and $5000 \leq Re \leq 10^8$

L = pipe length (100 ft)

D = pipe dia

V = Fluid velocity (actual)

g = gravitational Constant = 32.17 ft/s²

Re = Reynolds Number = $\frac{VD}{\nu}$ where ν = kinematic viscosity

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| | |
|---|---|
| SHEET | 2 OF 4 |
| JOB NO. | 1358.001.01 |
| FILE NAME | |
| PROJECT | MVSC/HARRIS |
| SUBJECT | PIPE LOSS – AS/SVE |
| COMPUTED BY | MWD DATE 4/2/2014 |
| CHECKED BY | DATE |

A) Calculate actual flows: $Q_A = Q_{SCFM}\left(\frac{P_{STD}}{P_{ACT} - (P_{SAT})(\phi)}\right) \times \left(\frac{460^\circ + T_{ACT}}{520^\circ}\right)$

$P_{STD} = 14.7$ psia
$P_{ACT} = 14.7 + 10$ psia $= 24.7$ psia
$P_{SAT} = 0.946$ psi (steam tables)
$\phi = 70\%$ RH

- $Q_{LATERAL} = 10_{scfm} \times \left(14.7/24.7 - 0.946)(0.70\right)\left(\frac{460^\circ + 100^\circ}{520^\circ}\right) = 6.6$ acfm
- $Q_{A\ Header} = 350$ scfm $\times$ " $\times$ " $= 231$ acfm

B) VELOCITY

- $V_{ACTUAL\ LATERAL} = \frac{6.6 \text{ cfm}}{\frac{\pi\left(0.957'' \times \frac{1ft}{12''}\right)^2}{4}} = 1{,}202 \frac{ft}{min} = 21.0$ ft/s
- $V_{ACTUAL\ Header} = \frac{231 \text{ cfm}}{\frac{\pi(3.068)^2}{4}} = 4490$ ft/min $= 74.8$ ft/s

C) REYNOLDS #

- $Re_{LATERAL} = \frac{(21.0 \text{ ft/s})\left(0.957 \text{ in} \times \frac{1ft}{12in}\right)}{1.8 \times 10^{-4} \text{ ft}^2/\text{s}} = 9317$
- $Re_{Header} = \frac{(74.8 \text{ ft/s})(3.068 \text{ in})}{1.8 \times 10^{-4} \text{ ft}^2/\text{s}} = 106{,}290$

D) FRICTION FACTOR

- $f_{LATERAL} = \frac{1.325}{\left[\ln\left(\frac{0.000005 \text{ ft}}{(3.7)(0.957/12)\text{ft}} + \frac{5.74}{(9317)^{0.9}}\right)\right]^2} = 0.0317$
- $f_{Header} = \frac{1.325}{\left[\ln\left(\frac{0.00015 \text{ ft}}{(3.7)(3.068/12)\text{ft}} + \frac{5.74}{(106{,}290)^{0.9}}\right)\right]^2} = 0.0206$

E) Head Loss per 100 ft

- $H_{LATERAL} = \dfrac{(0.0317)(100\,ft)(21.9\,ft/s)^2}{\left(\frac{0.957}{12}\,ft\right)(2)(32.17\,ft/s^2)} = 273\ ft_{AIR} \times \rho_{AIR_{STD}}$ $(0.075\,lb/ft^3)$

$= 20.5\ lb/ft^2 / 144\ \frac{in^2}{ft^2}$

$= 0.14\ psi/100\,ft\ pipe$

- $H_{Header} = \dfrac{(0.0206)(100\,ft)(74.8)^2}{\left(3.068/12\right)(2)(32.17)} \times \dfrac{0.075}{144} = 0.37\ psi/100\,ft\ pipe$

Step (2) Calculate Equivalent Length of Pipe

$L_E = L_A + \left(\frac{L}{D}\right)_{eq\ fittings}$ where $L_A$ = measured pipe length

$(L/D)_{ft\ fittings}$ = eq. length of fittings per pipe diameter

- Lateral $L_A$ = 240 ft from Manifold to AS-20 Well Head

| Fittings | # | | $(L/D)_{eq}$ | | | |
|---|---|---|---|---|---|---|
| Ball Valve | 1 | x | 12 | x | 0.957 in / 12 in/ft | = 1.0 |
| Flow Meter | 1 | x | 30 est | x | " | = 2.4 |
| Check Valve | 1 | x | 100 | x | " | = 8.0 |
| Elbows (90°) | 10 | x | 30 | x | " | = 30 |
| Expansion (1"x2") | 1 | x | 36 | x | " | = 2.9 |
| Hose Coupling (ignore hose) | 2 | x | 5 | x | " | = 0.8 |
| 4" Tee (ignore) | — | | — | | | + |
| 4" Well (ignore) | — | | — | | | |
| | | | | | | = 45 ft |

$L_E$ = 240 ft + 45 ft = 285 ft for longest 1" ϕ pipe

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| SHEET 4 OF 4 | |
| JOB NO. 1358.001.01 | |
| FILE NAME | |
| PROJECT MWSC/HARRIS | COMPUTED BY MWD DATE 4/2/2014 |
| SUBJECT PIPE LOSS – AS/SVE | CHECKED BY DATE |

- HEADER ASSUME LA = 30 ft

| | Fittings | # | (L/D)eq | | | |
|---|---|---|---|---|---|---|
| (L/Deq) | TEE | 3 | x 60 | x 3.068"/12 | = | 46 ft |
| | BALLVALVE | 1 | x 12 | x " | = | 3.1 ft |
| | CHECK VALVE | 1 | x 100 | x " | = | 25.6 ft |
| | Reducer (3"x1") | 1 | x 16 | x " | = | 4.1 ft |
| | | | | | | 78.8 ft |

$L_E$ = 30 ft + 78.8 ft = 109 ft

Step (3) CALCULATE ~~TOTAL~~ $H_L$ per ACTUAL LENGTH

(A) 1"ϕ LATERAL: 0.14 psi/100 ft x 285 ft = 0.4 psi

(B) 3"ϕ MANIFOLD: 0.37 psi/100 ft x 109 ft = 0.4 psi

0.8 psi ≈ 1 psi

∴ Longest pipe Run $H_L$ = 1 psi

CHECK Pressure @ WELL HEAD 8 psig Required

Pressure @ Manifold 10 psig Supplied

Losses − 1 psi

9 psig > 8 psig Required OK

(WORST CASE SUMMER MONTHS)

AS PRESSURE 10 psig OK

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| SHEET | 1 OF 4 |
| JOB NO. | 1358.001.01 |
| FILE NAME | |
| PROJECT | MVSC/HARRIS |
| COMPUTED BY | MND DATE 4/2/2014 |
| SUBJECT | PIPE HEAD LOSS - AS/SVE |
| CHECKED BY | DATE |

Problem: Estimate head loss in SVE piping – longest run

Assumptions:
1) $Q_{LATERAL}$ = 40 scfm
2) $Q_{Header}$ = 880 scfm
3) Temp = 54°F
4) Lateral pipe = 2" ϕ SCH 40 PVC (ID = 2.067")
5) Header pipe = 6" ϕ SCH 40 PVC (ID = 6.065")
6) Pipe Roughness factor (ϵ) $\epsilon_{plastic}$ = 0.000005 ft
7) Kinematic Viscosity (ν) = $1.58 \times 10^{-4}$ ft²/s
8) Vacuum at Header = $-25"\text{w.c.} \times \frac{1\text{ psi}}{27.48"} = -0.91$ psi

Step ① Determine $H_L$ per 100 ft pipe

$$H_L = \left(f\right)\left(\frac{L}{D}\right)\left(\frac{V^2}{2g}\right)$$

Where:
$$f = \frac{1.325}{\left[\ln\left(\frac{\epsilon}{3.7D} + \frac{5.74}{Re^{0.9}}\right)\right]^2}$$

SOURCE: Fluid Mechanics, 8th ed. Page 220. 1985 Streeter, V.L. & Wylie, E.B.

NOTE: Approximates w/in 1% of Colebrook Eq. when $10^{-6} \leq \frac{\epsilon}{D} \leq 10^{-2}$ and $5000 \leq Re \leq 10^8$

L = pipe length (100 ft)
D = pipe dia
V = Fluid velocity (actual)
g = gravitational Constant = 32.17 ft/s²
Re = Reynolds Number = $\frac{VD}{\nu}$ where ν = kinematic viscosity

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| SHEET 2 OF 4 | |
| JOB NO. 1358.001.01 | |
| FILE NAME | |
| PROJECT MVSC/HARRIS | COMPUTED BY MJD DATE 4/2/2014 |
| SUBJECT PIPE LOSS – AS/SVE | CHECKED BY DATE |

A) Calculate actual flows: $Q_A = Q_{SCFM}\left(\frac{P_{STD}}{P_{ACT} - (P_{SAT})(\phi)}\right) \times \left(\frac{460° + T_{ACT}}{520°}\right)$

$P_{STD} = 14.7$ psia

$P_{ACT} = 14.7 + -0.91$ psi $= 13.79$ psi

$P_{SAT} = 0.206$ (steam tables) @ 54°F

$\phi = 100\%$

- $Q_{A\,LATERAL} = 40_{scfm} \times \left(14.7/13.79 - (0.206)(1.0)\right)\left(\frac{460° + 60°}{520°}\right) = 43.3$ acfm
- $Q_{A\,Header} = 880$ scfm $\times$ " $\times$ " $= 952$ acfm

B) VELOCITY

- $V_{ACTUAL\ LATERAL} = \frac{43.3\ cfm}{\frac{\pi\left(2.067'' \times \frac{1ft}{12''}\right)^2}{4}} = 1858\ \frac{ft}{min} = 31.0\ ft/s$
- $V_{ACTUAL\ Header} = \frac{952\ cfm}{\frac{\pi(6.065^2)}{4}} = 4747\ ft/min = 79.1\ ft/s$

C) REYNOLDS #

- $Re_{LATERAL} = \frac{(31.0\ ft/s)\left(2.067\ in \times \frac{1ft}{12in}\right)}{1.58 \times 10^{-4}\ ft^2/s} = 33,761$
- $Re_{Header} = \frac{(79.1\ ft/s)(6.065\ in)/12}{1.58 \times 10^{-4}\ ft^2/s} = 253,061$

D) FRICTION FACTOR

- $f_{LATERAL} = \frac{1.325}{\left[\ln\left(\frac{0.000005\ ft}{(3.7)(2.067/12)ft} + \frac{5.74}{(33,761)^{0.9}}\right)\right]^2} = 0.0228$
- $f_{Header} = \frac{1.325}{\left[\ln\left(\frac{0.000005\ ft}{(3.7)(6.065/12)ft} + \frac{5.74}{(253,061)^{0.9}}\right)\right]^2} = 0.0156$

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| PROJECT MUSC / Harris | COMPUTED BY MWD | DATE 4/2/2014 | |
| SUBJECT Pipe Loss – AS/SVE | CHECKED BY | DATE | |

E) Head Loss per 100 ft

- $H_{Lateral} = \dfrac{(0.0228)(100\,ft)(31.0\,ft/s)^2}{\left(\frac{2.067}{12}\,ft\right)(2)(32.17\,ft/s^2)} = 1197\ ft_{AIR} \times \rho_{AIR_{STD}}$ $(0.075\,lb/ft^3)$

  $= 14.8\ lb/ft^2 / 144\ \frac{in^2}{ft^2}$

  $= 0.1\ psi / 100\,ft\ pipe$

  $= 2.8"\ w.c. / 100\,ft$

- $H_{Header} = \dfrac{(0.0156)(100\,ft)(79.1)^2}{\left(6.065/12\right)(2)(32.17)} \times \dfrac{0.075}{144} = 0.156\ psi/100\,ft\ pipe$

  $= 4.3"\ w.c./100\,ft$

Step (2) Calculate 'Equivalent Length of Pipe

$L_E = L_A + \left(\frac{L}{D}\right)_{eq\ fittings}$ where $L_A$ = measured pipe length

$(L/D)_{ft\ fittings}$ = eq. length of fittings per pipe diameter

- Lateral $L_A$ = 260 ft to SVE-11A

| Fittings | # | | $(L/D)_{eq}$ | | | |
|---|---|---|---|---|---|---|
| Ball Valve | 1 | x | 12 | x | 2.067 in/12 in/ft | = 2.1 ft |
| Elbows (90°) | 3 | x | 30 | x | " | = 15.5 ft |
| Expansion (2"x4") | 1 | x | 36 | x | " | = 6.2 ft |
| | | | | | | 24 ft |

$L_E$ = 260 ft + 24 ft = 284 ft for longest 2" ϕ pipe

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|---|---|
| PROJECT | MVSC/HARRIS |
| SUBJECT | PIPE LOSS - AS/SVE |

- HEADER $L_A$ =

| $(L/D_{eq})$ Fittings | # | | $(L/D)_{eq}$ | | |
|---|---|---|---|---|---|
| Ball Valve | 1 | x | 12 | x 6.065 /12 in/ft | = 6.1 ft |
| Elbow (90°) | 4 | x | 30 | x " | = 61 ft |
| Tee-Straight | 1 | x | 20 | x " | = 10.1 ft |
| | | | | | 77 ft |

$L_E = 75$ ft + 77 ft = 152 ft

Step (3) CALCULATE TOTAL $H_L$ per ACTUAL LENGTH

(A) 2" ϕ LATERAL 2.8" wc /100 ft x 284 ft = 8.0" w.c.

(B) 6" ϕ MANIFOLD : 4.3" wc /100 ft x 152 ft = 6.5" w.c.

14.5" w.c.

∴ Longest pipe Run $H_L$ = 15" w.c.

CHECK

VACCUM AT WELLHEAD REQ'D = 10" w/c (MAX)

VACUUM AT HEADER = 25" w.c.

LOSSES = -15" w.c.

10" w.c. Available OK ✓

* 6" Header losses are conservative because header loses 40% of its flow w/in first half of pipe (to SVE-4 through SVE-10 & SVE-19) such that the actual losses in the header would be closer to 4 to 4.5" w.c. leaving roughly 12" w.c. available at SVE-11A.