Groundwater Compliance Monitoring Data Summary Report – August 2014

318 State Avenue NE Property
Olympia, Washington

for
City of Olympia

October 17, 2014

GeoEngineers
Earth Science + Technology

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Olympia, Washington

File No. 0415-049-06

October 17, 2014

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INTRODUCTION

This data summary report presents the results of groundwater compliance monitoring performed by the City of Olympia (City) in August 2014 at the 318 State Avenue NE property in Olympia, Washington (Property) (Figure 1). Groundwater compliance monitoring at the Property is intended to monitor the natural attenuation of chlorinated organic solvents and associated degradation products identified as chemicals of concern (COCs) in groundwater after completion of the soil remedial action performed in September and October 2009. Remediation of soil and groundwater at the Property is being performed to support the goal of achieving a No Further Action (NFA) determination for the Property under the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP).

The chlorinated solvents being monitored for natural attenuation as part of groundwater compliance monitoring include tetrachloroethene (PCE) and trichloroethene (TCE) as well as associated degradation products. Monitoring also includes measurement of water quality parameters that are indicators of the natural attenuation. Monitoring of chlorinated solvents, degradation products and natural attenuation parameters is being performed in accordance with the Groundwater Compliance Monitoring Plan (CMP) for the Property (GeoEngineers, 2010a).

Groundwater samples were collected on August 25, 2014 from three monitoring wells that included MW-03, MW-16 and MW-18 (Figure 2). These samples were submitted for analysis to TestAmerica Laboratory in Fife, Washington. Groundwater samples and groundwater levels were collected from selected monitoring wells at the site in accordance with the CMP for the Property (GeoEngineers, 2010a).

The following sections summarize the background for compliance monitoring, field sampling activities, groundwater gradients at the Property and results of groundwater sampling and analysis.

BACKGROUND

Remedial actions were performed in September and October 2009 to remove soil and fill material containing volatile organic compounds (VOCs) including chlorinated solvents, metals and carcinogenic polycyclic aromatic compounds (cPAHs) at concentrations greater than the Model Toxics Control Act (MTCA) cleanup levels (CULs). Soil samples were subsequently collected from the boundary of remedial action areas to assess if soil and fill with contaminant concentrations greater than cleanup levels were present at the limits of the remedial excavation. The results of the soil remedial action are presented in the Remedial Action Construction Report prepared for the Property (GeoEngineers, 2010b).

Compliance monitoring is being performed after completion of soil remedial actions to evaluate the concentrations and natural attenuation of chlorinated organic solvents in groundwater at the Property. The concentrations are compared to the MTCA groundwater CULs for unrestricted land use (ULU). The natural attenuation of chlorinated organic solvents has been monitored via quarterly monitoring through February 2012 and semi-annual monitoring starting in August 2012. Monitoring has included the following:

- Installation of two new monitoring wells in May 2010 during the first compliance groundwater monitoring event. Monitoring well MW-17 was installed within Contaminated Soil Zone 1 (CSZ 1) where soil remediation was performed in September and October 2009 and MW-18 was installed north of the CSZ 1 (Figure 2).
- Quarterly groundwater sampling at eight monitoring wells including MW-03, MW-04, MW-08, MW-09, MW-13 and MW-16 through MW-18 in May 2010, August 2010, November 2010 and February 2011.
- Quarterly groundwater sampling at five monitoring wells including MW-03, MW-08 and MW-16 through MW-18 in May 2011, August 2011, November 2011 and February 2012.
- Semi-annual groundwater sampling at five monitoring wells including MW-03, MW-08 and MW-16 through MW-18 in August 2012, February 2013 and August 2013.
- Semi-annual groundwater sampling at three monitoring wells including MW-03, MW-16 and MW-18 in February 2014 and August 2014.
- Analysis for chlorinated organic solvents and associated degradation products including PCE, TCE, 1,1-dichloroethene (1,1-DCE), cis-dichloroethene (cis-DCE), trans-dichloroethene (trans-DCE) and vinyl chloride (VC).
- Monitoring for indicators of natural attenuation including ferrous iron, sulfate, dissolved oxygen (DO), pH, electrical conductivity and oxidation-reduction potential (ORP).
- Monitoring of groundwater gradients by measuring water levels at all existing monitoring wells at the site through February 2012. Groundwater level measurements were reduced to five monitoring wells (i.e., MW-03, MW-08 and MW-16 through MW-18) for the monitoring events performed from August 2012 through August 2014.

Additionally, analysis for arsenic was performed in accordance with the CMP between May 2010 and February 2011 to provide additional information concerning arsenic concentrations in the area. Arsenic analysis was discontinued after the February 2011 groundwater compliance monitoring event because the arsenic results for sampling performed between May 2010 and February 2011 indicate that arsenic concentrations are less than the MTCA Method A CUL in groundwater on the Property (Table 1). Arsenic concentrations were detected at concentrations greater than the MTCA CUL in locations upgradient of the Property that are likely related to area-wide groundwater conditions or an upgradient source. Ecology concurrence for discontinuing arsenic analysis was provided in an email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers dated May 16, 2011.

Ecology also previously requested that groundwater be analyzed for constituents associated with a petroleum hydrocarbon release during the May 2010 groundwater compliance monitoring event to evaluate the potential impacts from a UST encountered at the Property during the remedial action for soil. The sampling and analysis requirements to assess potential impacts from the former UST were documented in an email from Iain Wingard, GeoEngineers to Eugene Radcliff; Ecology dated May 11, 2010. The additional analyses requested by Ecology were performed during the May 2010 compliance monitoring event (GeoEngineers, 2010c). Only benzene was detected in two samples at concentrations well below the MTCA Method A groundwater CUL. Based on the May 2010 sample results, no additional monitoring was necessary to assess potential impacts from the UST or petroleum hydrocarbons at the Property. However, Ecology requested in an email from

Eugene Radcliff of Ecology to Iain Wingard of GeoEngineers dated July 19, 2010 that compliance groundwater monitoring include benzene analysis. Therefore, groundwater compliance monitoring performed between May 2010 and February 2011 continued to include analysis for benzene. Benzene analysis was discontinued after the February 2011 compliance monitoring event because the results for sampling performed between May 2010 and February 2011 indicate that benzene is not present at concentrations greater than the MTCA Method A CUL (Table 1). Ecology concurrence for discontinuing benzene analysis was provided in an email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers dated May 16, 2011.

Eight groundwater wells were sampled during the May 2010, August 2010, November 2010 and February 2011 groundwater compliance monitoring events. The number of groundwater monitoring locations were reduced from eight to five during the May 2011 compliance monitoring event as the results of groundwater compliance monitoring performed between May 2010 and February 2011 indicate that the concentrations of chlorinated organic solvents and associated degradation products are less than the MTCA CULs at monitoring well locations MW-13, MW-04, MW-17 and MW-09 (Table 1). Ecology concurrence for discontinuing groundwater monitoring at monitoring well locations MW-13, MW-04 and MW-09 was provided in an email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers dated May 16, 2011. Groundwater compliance monitoring continued to be performed at MW-17 to monitor upgradient/background conditions on the Property.

Quarterly groundwater compliance monitoring was implemented between May 2010 and February 2012. The frequency of groundwater monitoring was reduced from quarterly to semi-annually during the August 2012 compliance monitoring event after the results of previous groundwater compliance monitoring events indicated that the highest and lowest concentrations of chlorinated organic solvents and associated degradation products were detected during the month of February and August (Table 1, Figures 4 through 6). Groundwater gradient mapping has also been discontinued as part of reporting and is not included in this compliance groundwater report because groundwater gradient patterns have generally been established through groundwater measurements collected between May 2010 and February 2012. Ecology concurrence for reducing compliance monitoring frequency and discontinuing groundwater gradient mapping was provided in an email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers dated May 8, 2012.

Five groundwater wells were sampled during the August and February 2011, August and February 2012 and August and February 2013 groundwater compliance monitoring events. The number of groundwater monitoring locations were reduced from five to three during the February 2014 compliance monitoring event as the results of groundwater compliance monitoring performed between February 2011 and August 2013 indicate that the concentrations of chlorinated organic solvents and associated degradation products are less than the MTCA CULs at monitoring well locations MW-08 and MW-17 (Table 1). Ecology concurrence for discontinuing groundwater monitoring at monitoring well locations MW-08 and MW-17 were provided in two emails from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers dated October 3, 2013 and November 4, 2013, respectively.

FIELD ACTIVITIES

Groundwater compliance monitoring samples were collected in August 2014 using low-flow/ low-turbidity sampling techniques to minimize the suspension of particulates in the samples. Groundwater samples were obtained from the wells using dedicated submersible electric pumps (Whale Pump Brand) with dedicated flexible vinyl tubing. Groundwater was pumped at approximately 0.5 liters per minute from the approximate mid-point of the screened interval to collect the samples.

Water quality parameters were measured during purging using an YSI Professional Plus water quality meter with a flow-through cell. The measured water quality parameters included electrical conductivity, DO, pH, turbidity, reduction potential (ORP), salinity, total dissolved solids (TDS) and temperature. Groundwater samples were collected once the water quality parameters generally varied by less than 10 percent on three consecutive measurements. All field measurements were documented on the field logs.

Following well purging, the flow-through cell was disconnected and the groundwater samples were collected in appropriate laboratory-prepared and -provided containers. The samples were protected and placed into a cooler with ice and delivered to TestAmerica Laboratory in Fife, Washington, for analysis following appropriate chain-of-custody procedures. Purge water was stored in labeled 55-gallon drums for future permitted off-site disposal. The groundwater samples were submitted for the following analyses to provide results for chlorinated organic solvents and associated degradation products as well as water quality parameters as specified in the CMP:

- VOCs by Environmental Protection Agency (EPA) Method 8260
- Sulfate by EPA Method 300.0

Ferrous iron concentrations were evaluated in the field using a Hach field test kit and the results were recorded on the field logs prior to collection of samples for laboratory analysis.

ANALYTICAL RESULTS

The results from groundwater sample collection and analysis performed in August 2014 are summarized in the following sections. Table 1 summarizes the results for the chemical analyses performed as part of groundwater compliance monitoring in August 2014. Table 1 also includes the results from groundwater compliance monitoring performed in: May, August and November 2010; February, May, August and November 2011; August and February 2012; August and February 2013; and February 2014 for comparison purposes. Table 2 summarizes water quality and natural attenuation parameter measurements collected in August 2014 and also includes the results from: May, August and November 2010; February, May, August and November 2011; August and February 2012; August and February 2013; and February 2014 for comparison. Finally, Appendix A contains the laboratory analytical reports and Appendix B contains the Data Quality Assessment Report presenting the results of data validation of the chemical analyses performed in August 2014.

Groundwater Compliance Monitoring Analyses

Natural Attenuation Parameters

The geochemical indicators of natural attenuation measured in August 2014 are generally similar to the August 2010, August 2011, August 2012 and August 2013 compliance events which indicate more reductive conditions in groundwater downgradient of soil remediation area CSZ 1 (Table 2). The more reductive conditions are indicated by generally lower sulfate and higher ferrous iron concentrations and lower ORP in groundwater collected from monitoring wells MW-03, MW-16 and MW-18.

The more reductive conditions measured downgradient of the soil remediation area CSZ 1 are likely related to seasonal groundwater conditions in August resulting from decreased precipitation and associated decrease in stormwater infiltration on and around the Property. The groundwater conditions in August 2014 are generally more favorable for degradation of chlorinated solvents (i.e., trichloroethene).

Chlorinated Organic Solvents and Associated Degradation Products

TCE, cis-DCE, trans-DCE and VC were detected in groundwater samples collected from monitoring wells MW-16 and MW-18 and cis-DCE, trans-DCE and VC were detected in the groundwater sample collected from monitoring well MW-03 in August 2014 (Table 1). The detected concentrations of TCE, cis-DCE and trans-DCE at the Property continue to be well below the MTCA groundwater CULs.

VC was detected in the groundwater samples collected from monitoring wells MW-03, MW-16 and MW-18 during the August 2014 sampling event at concentrations greater than the MTCA Method A CUL (Table 1 and Figure 3).

DISCUSSION

Natural Attenuation of Chlorinated Solvents and Associated Degradation Products in Groundwater

Soil remedial actions were performed at CSZ 1 in September and October 2009 to remove material with chemical concentrations greater than soil cleanup levels that was a source of chlorinated compounds in groundwater. Prior to remedial actions for soil, TCE and VC were detected at concentrations greater than CULs in groundwater. VC was detected in groundwater at concentrations greater than the CUL in seven wells present at the Property prior to completion of the remedial actions for soil. VC is the remaining chlorinated compound present in groundwater at the Property at a concentration greater than CULs. VC was detected in groundwater at three locations at a concentration greater than the CUL in August 2014.

Continued temporal analysis of the detected concentrations of chlorinated compounds present in groundwater at the Property was performed to assess trends in chlorinated compound concentrations. The detected chlorinated compound concentrations plotted through time are presented in Figures 4 through 6. The data presented for monitoring wells MW-03 and MW-16 include the results of the groundwater monitoring event performed prior to remedial actions for soil (i.e., March 2009) as well as the groundwater monitoring events that have been performed after

the completion of soil remedial. The data presented for monitoring well MW-18 include the groundwater monitoring events performed after the soil remedial actions as this well was installed after completion of the soil remedial actions. The following summarizes the results of the trend analysis:

- MW-03 – Monitoring well MW-03 is located downgradient/crossgradient of soil remedial action area CSZ 1 (Figure 3). The concentrations of chlorinated compounds including VC in groundwater from MW-03 decreased after completion of soil remedial actions at CSZ 1 in the sample collected in May 2010 (Figure 4 and Table 1). The concentrations of chlorinated compounds have fluctuated (i.e., increased and decreased) in groundwater at MW-03 between August 2010 and August 2014. Lower concentrations of chlorinated compounds in groundwater at MW-03 are generally present when groundwater levels are lowest in August, including August 2014 (Figure 5 and Tables 1 and 2). The VC concentration in groundwater at MW-03 in August 2014 (0.25 µg/L), which is slightly greater than the MTCA Method A CUL (0.2 µg/L), was similar to the concentrations during the August 2011 (0.37 µg/L), August 2012 (0.27 µg/L) and August 2013 (0.15 µg/L) monitoring events.
- MW-16 – Monitoring well MW-16 is located downgradient of soil remedial action area CSZ 1 (Figure 3). The concentration of VC in groundwater from MW-16 decreased after completion of soil remedial actions at CSZ 1 (Figure 5 and Table 1). Higher concentrations of chlorinated compounds are generally present in groundwater in MW-16 in August. VC was detected at MW-16 at concentrations greater than the MTCA Method A CUL during the August 2011 (0.70 µg/L), August 2012 (0.47 µg/L), and August 2013 (0.44 µg/L) monitoring events (Figure 5 and Table 1). VC was again detected at MW-16 at a concentration (0.52 µg/L) greater than the MTCA Method A CUL (0.2 µg/L) during the August 2014 monitoring event. VC was detected at MW-16 at concentrations less than the MTCA Method A CUL during February monitoring events in 2012, 2013 and 2014 (Figure 5 and Table 1). The concentrations of TCE, cis-DCE and trans-DCE continue to be an order of magnitude less than the MTCA CULs.
- MW-18 – Monitoring well MW-18 is located downgradient of soil remedial action area CSZ 1 (Figure 3). The concentration of VC in groundwater from MW-18 decreased between May 2010 and February 2011 after completion of soil remedial actions at CSZ 1 (Figure 6 and Table 1). The VC concentrations in groundwater at monitoring well MW-18 have fluctuated between May 2010 and August 2014. Similar to MW-16, higher concentrations of chlorinated compounds are generally present in groundwater in MW-18 in August and lower concentrations are present in February. The concentration of VC were less than the MTCA Method A CUL during the February 2013 monitoring event. The increase in the VC concentration at monitoring well MW-18 between February and August is most likely attributed to the migration of VC from the upgradient monitoring well location MW-03 as chlorinated compounds degrade to VC in the groundwater. The concentration of VC increased between the February and August 2014 event and is the same concentration as the August 2012 event. The concentrations of TCE, cis-DCE and trans-DCE at MW-18 remain less than the MTCA CULs for these compounds.

Overview of Groundwater Compliance Monitoring Results

The results of groundwater compliance monitoring indicate that natural attenuation of chlorinated solvents and associated degradation products generally continue to occur at the Property. The observed concentrations of PCE and TCE and associated degradation products cis-DCE and trans-

DCE in groundwater samples collected from the Property remain well below the CULs for these compounds.

Three locations had VC concentrations greater than the MTCA Method A CUL in groundwater during the August 2014 monitoring event (i.e., MW-03, MW-16 and MW-18) (Figures 4, 5 and 6 and Table 1). VC decreased in groundwater at MW-03, and increased at MW-16 and MW-18 during the August 2014 monitoring event.

Geochemical indicators of natural attenuation have fluctuated seasonally between reductive and oxidative conditions during compliance monitoring events performed at the Property. Reductive conditions generally occur during the August timeframe and were generally present during the August 2014 compliance monitoring event. It is anticipated that oxidative conditions will return during the winter and spring months of 2015. The groundwater conditions observed during the August 2014 event and previously observed at the Property (i.e., fluctuation between reductive and oxidative conditions) are anticipated to be favorable to the continued breakdown of chlorinated solvents and associated degradation products.

Future Groundwater Compliance Monitoring

The next round of semi-annual groundwater compliance monitoring is scheduled to be performed in February 2015. Groundwater compliance monitoring will be performed at groundwater monitoring wells MW-03, MW-16 and MW-18.

REFERENCES

Email from Iain Wingard, GeoEngineers to Eugene Radcliff, Ecology "Subject: City of Olympia Groundwater Compliance Monitoring," dated May 11, 2010.

Email from Eugene Radcliff of Ecology to Iain Wingard of GeoEngineers, "Subject: State Avenue Property May 2010 Groundwater Compliance Monitoring Report," dated July 19, 2010.

Email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers, "Subject: Ecology response to the February 2011 Groundwater Monitoring Report," dated May 16, 2011.

Email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers, "Subject: Monitoring and Reporting at the City of Olympia 318 State Avenue Property," dated May 8, 2012.

Email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers, "Subject: Groundwater Monitoring Report for City of Olympia 318 S State Street Property," dated October 3, 2013.

Email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers, "Subject: Groundwater Monitoring Report for City of Olympia 318 S State Street Property," dated November 4, 2013.

GeoEngineers, 2010a, Groundwater Compliance Monitoring Plan, 318 State Avenue NE, Olympia, Washington, April 16, 2010.

GeoEngineers, 2010b, Remedial Action Construction Report, 318 State Avenue NE, Olympia, Washington, January 5, 2010.

GeoEngineers, 2010c, Groundwater Compliance Monitoring Data Summary Report – May 2010, 318 State Avenue NE, Olympia, Washington, July 16, 2010.

LIMITATIONS

This Groundwater Monitoring Report has been prepared for use by the City of Olympia. GeoEngineers has performed these services in general accordance with the scope and limitations of our proposal.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted environmental science practices for groundwater monitoring in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

TABLE 1

SUMMARY OF GROUNDWATER COMPLIANCE MONITORING PARAMETERS[1] - AUGUST 2014

318 STATE AVENUE NE

OLYMPIA, WASHINGTON

			Volatile Organic Compounds							Total Metals
		Analyte	**Tetrachloroethene**	**Trichloroethene**	**1,1-Dichloroethene**	**Cis-1,2-Dichloroethene**	**Trans-1,2-Dichloroethene**	**Vinyl Chloride**	**Benzene**	**Arsenic**
		Unit	**(µg/l)**	**(µg/l)**	**(µg/l)**	**(µg/l)**	**(µg/l)**	**(µg/l)**	**(µg/l)**	**(mg/l)**
		MTCA Method A Cleanup Level	**5**	**5**	**4,000,000 [2]**	**800,000 [2]**	**1,600,000 [2]**	**0.2**	**5**	**0.005**
Location	**Sample ID**	**Sample Date**								
MW-13 [11]	MW13-052510-W	05/25/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	NA	**0.0041 J**
	MW13-082410-W	08/24/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	**0.058 J**
	MW13-112210-W	11/22/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	0.0004 UJ
	MW13-022211-W	02/22/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	**0.0012**
MW-04 [11]	MW4-052510-W	05/25/10	0.1 U	**0.28**	0.1 U	**0.11**	0.1 U	**0.12**	NA	**0.0045 J**
	MW4-082410-W	08/24/10	0.1 U	**0.14**	0.1 U	**0.14**	0.1 U	**0.074**	0.1 U	**0.0051 J**
	MW4-112210-W	11/22/10	0.1 U	**0.34**	0.1 U	0.1 U	0.1 U	**0.065**	0.1 U	**0.00067 J**
	MW4-022211-W	02/22/11	0.1 U	**0.25**	0.1 U	0.1 U	0.1 U	**0.053**	0.1 U	**0.0023**
MW-17 [14]	MW17-052410-W	05/24/10	0.1 UJ	**0.26 J**	0.1 UJ	0.1 UJ	0.1 UJ	**0.084 J**	**0.17 J**	**0.0031 J**
	MW17-082410-W	08/24/10	0.1 U	0.1 U	0.1 U	**0.11**	0.1 U	**0.025**	0.1 U	0.002 UJ
	MW17-112210-W	11/22/10	0.1 U	**0.22**	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	**0.0016 J**
	MW17-022211-W	02/22/11	0.1 U	**0.18**	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	**0.0012**
	MW17-052511-W	05/25/11	**0.1**	**0.21**	0.1 U	0.1 U	0.1 U	**0.02**	NA[12]	NA[12]
	MW17-082411-W	08/24/11	0.1 U	**0.18**	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW17-112911-W	11/29/11	0.1 U	**0.12**	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW17-022812-W	02/28/12	0.1 U	**0.10**	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW17-082312-W	08/23/12	0.1 U	**0.14**	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW17-022813-W	02/28/13	0.1 U	0.1U	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW17-82213-W	08/22/13	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.020 U	NA[12]	NA[12]
MW-09 [11]	MW9-052510-W	05/25/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	NA	**0.0016 J**
	MW9-082410-W	08/24/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	0.002 UJ
	MW9-112210-W	11/22/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	0.0004 UJ
	MW9-022211-W	02/22/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	**0.00059**
MW-03 [14]	MW3-052410-W	05/24/10	0.1 U	**0.48**	0.1 U	**0.14**	0.1 U	**0.48**	0.1 U	**0.002 J**
	MW3-082510-W	08/25/10	0.1 U	**0.26**	0.1 U	**0.11**	0.1 U	**0.12**	0.1 U	0.002 UJ
	MW3-112410-W	11/24/10	0.1 U	**1.3**	0.1 U	**0.28**	0.1 U	**1.1**	0.1 U	0.0004 UJ
	MW3-022311-W	02/23/11	0.1 U	**1.6**	0.1 U	**0.59**	0.1 U	**0.92**	0.1 U	**0.0010**
	MW3-052511-W	05/25/11	0.1 U	**1.5**	0.1 U	**0.6**	**0.15**	**0.83**	NA[12]	NA[12]
	DUP-052511-W[7]	05/25/11	0.1 U	**1.2**	0.1 U	**0.36**	**0.12**	**0.69**	NA[12]	NA[12]
	MW3-082411-W	08/24/11	0.1 U	**0.64 J**	0.1 U	**0.31**	**0.11**	**0.37 J**	NA[12]	NA[12]
	DUP-082411-W[8]	08/24/11	0.1 U	**0.49 J**	0.1 U	**0.23**	0.1 U	**0.27 J**	NA[12]	NA[12]
	MW3-112911-W	11/29/11	0.1 U	**2.6**	0.1 U	**0.39**	**0.11**	**0.45**	NA[12]	NA[12]
	DUP-112911-W[9]	11/29/11	0.1 U	**2.7**	0.1 U	**0.41**	**0.10**	**0.52**	NA[12]	NA[12]
	MW3-022812-W	02/28/12	0.1 U	**0.99**	0.1 U	**0.63**	**0.18**	**1.4**	NA[12]	NA[12]
	DUP-022812-W[10]	02/28/12	0.1 U	**1.3**	0.1 U	**0.84**	**0.19**	**1.9**	NA[12]	NA[12]
	MW3-082312-W	08/23/12	0.1 U	**0.11**	0.1 U	**0.36**	**0.3**	**0.27**	NA[12]	NA[12]
	DUP-082312-W[13]	08/23/12	0.1 U	**0.11**	0.1 U	**0.34**	**0.33**	**0.26**	NA[12]	NA[12]
	MW3-022813-W	02/28/13	0.1 U	**0.70**	0.1 U	**0.34**	**0.14**	**0.72**	NA[12]	NA[12]
	DUP-022813-W[15]	02/28/13	0.1 U	**0.68**	0.1 U	**0.32**	**0.12**	**0.69**	NA[12]	NA[12]
	MW03-82213-W	08/22/13	0.1 U	0.1 U	0.1 U	**0.24**	**0.28**	**0.15**	NA[12]	NA[12]
	DUP01-82213-W[16]	08/22/13	0.1 U	0.1 U	0.1 U	**0.23**	**0.32**	**0.16**	NA[12]	NA[12]
	MW3-140227-W	02/27/14	0.1 U	**2.5**	0.10 U	**0.75**	**0.12**	**0.79**	NA[12]	NA[12]
	MW03-140825-W	08/25/14	0.1 U	0.1 U	0.1 U	**0.35**	**0.36**	**0.25**	NA[12]	NA[12]

			Volatile Organic Compounds							Total Metals
	Analyte		Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	Cis-1,2-Dichloroethene	Trans-1,2-Dichloroethene	Vinyl Chloride	Benzene	Arsenic
	Unit		(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(mg/l)
	MTCA Method A Cleanup Level		5	5	4,000,000 [2]	800,000 [2]	1,600,000 [2]	0.2	5	0.005
MW-08 [14]	MW8-052410-W	05/24/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.21**	0.1 U	**0.0027 J**
	DUP-1-052410-W[3]	05/24/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.23**	0.1 U	**0.0027 J**
	MW8-082510-W	08/25/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.29**	0.1 U	**0.0045 J**
	DUP-1-082510-W[4]	08/25/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.29**	0.1 U	**0.0045 J**
	MW8-112410-W	11/24/10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.066**	0.1 U	0.0004 UJ
	MW8-022311-W	02/23/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	0.1 U	**0.0019**
	MW8-052511-W	05/25/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.04**	NA[12]	NA[12]
	MW8-082411-W	08/24/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.21**	NA[12]	NA[12]
	MW08-112911-W	11/29/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW08-022812-W	02/28/12	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02 U	NA[12]	NA[12]
	MW08-082312-W	08/23/12	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.13**	NA[12]	NA[12]
	MW08-022813-W	02/28/13	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.02U	NA[12]	NA[12]
	MW8-82213-W	08/22/13	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.10**	NA[12]	NA[12]
MW-16 [14]	MW16-052410-W	05/24/10	0.1 U	**0.44**	0.1 U	**0.2**	**0.18**	**0.76**	0.1 U	**0.0019 J**
	MW16-082510-W	08/25/10	0.1 U	**0.46**	0.1 U	**0.32**	**0.34**	**1.0**	**0.12**	0.002 UJ
	MW16-112410-W	11/24/10	0.1 U	**0.49**	0.1 U	**0.17**	**0.19**	**0.33**	0.1 U	**0.0013 J**
	DUP-1-112410-W[5]	11/24/10	0.1 U	**0.50**	0.1 U	**0.16**	**0.21**	**0.38**	0.1 U	0.0004 UJ
	MW16-022311-W	02/23/11	0.1 U	**0.42**	0.1 U	**0.13**	**0.13**	**0.22**	0.1 U	**0.0014**
	DUP-1-022311-W[6]	02/23/11	0.1 U	**0.43**	0.1 U	**0.11**	**0.15**	**0.23**	0.1 U	**0.0015**
	MW16-052511-W	05/25/11	0.1 U	**0.47**	0.1 U	0.1 U	**0.16**	**0.18**	NA[12]	NA[12]
	MW16-082411-W	08/24/11	0.1 U	**0.41**	0.1 U	**0.26**	**0.24**	**0.70**	NA[12]	NA[12]
	MW16-112911-W	11/29/11	0.1 U	**0.35**	0.1 U	**0.10**	**0.12**	**0.15**	NA[12]	NA[12]
	MW16-022812-W	02/28/12	0.1 U	**0.40**	0.1 U	0.1 U	**0.13**	**0.17**	NA[12]	NA[12]
	MW16-082312-W	08/23/12	0.1 U	**0.52**	0.1 U	**0.21**	**0.2**	**0.47**	NA[12]	NA[12]
	MW16-022813-W	02/28/13	0.1 U	**0.28**	0.1 U	0.1 U	0.1 U	**0.086**	NA[12]	NA[12]
	MW16-82213-W	08/22/13	0.1 U	**0.26**	0.1 U	**0.22**	**0.13**	**0.44**	NA[12]	NA[12]
	MW16-140227-W	02/27/14	0.1 U	**0.24**	0.1 U	0.1 U	0.1 U	**0.093**	NA[12]	NA[12]
	DUP01-140227-W[17]	02/27/14	0.1 U	**0.26**	0.1 U	0.1 U	0.1 U	**0.090**	NA[12]	NA[12]
	MW16-140825-W	08/25/14	0.1 U	**0.37**	0.1 U	**0.25**	**0.18**	**0.52**	NA[12]	NA[12]
	DUP01-140825-W[18]	08/25/14	0.1 U	**0.36**	0.1 U	**0.25**	**0.19**	**0.51**	NA[12]	NA[12]
MW-18 [14]	MW18-052410-W	05/24/10	0.1 U	**0.62**	0.1 U	**0.28**	**0.16**	**2.3**	**0.2**	**0.0038 J**
	MW18-082510-W	08/25/10	0.1 U	**0.25**	0.1 U	**0.22**	**0.13**	**1.9**	**0.19**	**0.0028 J**
	MW18-112410-W	11/24/10	0.1 U	**0.81**	0.1 U	**0.34**	**0.23**	**1.7**	**0.11**	**0.0032 J**
	MW18-022311-W	02/23/11	0.1 U	**0.72**	0.1 U	**0.3**	**0.16**	**0.9**	0.1 U	**0.0045**
	MW18-052511-W	05/25/11	0.1 U	**0.63**	0.1 U	**0.21**	**0.14**	**1.2**	NA[12]	NA[12]
	MW18-082411-W	08/24/11	0.1 U	**0.4**	0.1 U	**0.39**	**0.24**	**2.3**	NA[12]	NA[12]
	MW18-112911-W	11/29/11	0.1 U	**0.57**	0.1 U	**0.30**	**0.15**	**0.86**	NA[12]	NA[12]
	MW18-022812-W	02/28/12	0.1 U	**0.49**	0.1 U	**0.20**	**0.16**	**1.20**	NA[12]	NA[12]
	MW18-082312-W	08/23/12	0.1 U	**0.62**	0.1 U	**0.43**	**0.29**	**2.7**	NA[12]	NA[12]
	MW18-022813-W	02/28/13	0.1 U	**0.34**	0.1 U	0.1U	0.1U	**0.15**	NA[12]	NA[12]
	MW18-82213-W	08/22/13	0.1 U	**0.61**	0.1 U	**0.45**	**0.28**	**2.1**	NA[12]	NA[12]
	MW18-140227-W	02/27/14	0.1 U	**0.57**	0.1 U	**0.26**	**0.26**	**1.3**	NA[12]	NA[12]
	MW18-140825-W	08/25/14	0.1 U	**0.48**	0.1 U	**0.51**	**0.43**	**2.7**	NA[12]	NA[12]

Notes:

[1] The parameters presented are the groundwater compliance monitoring parameters specified in the Groundwater Compliance Monitoring Plan (GeoEngineers 2010) and benzene as requested by Ecology in an email from Eugene Radcliff, Ecology to Iain Wingard, GeoEngineers dated July 19, 2010. Analysis for benzene and arsenic were discontinued as benzene was never detected at a concentration greater than cleanup levels and arsenic concentrations are less than cleanup levels and appear to be associated with regional conditions. Ecology concurrence for discontinuing benzene and arsenic analysis was provided in an email from Eugene Radcliff, Ecology, to Iain Wingard, GeoEngineers, dated May 16, 2011.

[2] A MTCA Method A groundwater cleanup level has not been established; therefore, the MTCA Method B groundwater cleanup level has been provided.

[3] Sample DUP-1-052410-W is a field duplicate of sample MW8-052410-W.

[4] Sample DUP-1-082510-W is a field duplicate of sample MW8-082510-W.

[5] Sample DUP-1-112410-W is a field duplicate of sample MW16-112410-W.

[6] Sample DUP-1-022311-W is a field duplicate of sample MW16-022311-W.

[7] Sample DUP-052511-W is a field duplicate of sample MW3-052511-W.

[8] Sample DUP-082411-W is a field duplicate of sample MW3-082411-W.

[9] Sample DUP-112911-W is a field duplicate of sample MW3-112911-W.

[10] Sample DUP-022812-W is a field duplicate of sample MW3-022812-W.

[11] Groundwater sampling and analysis at this monitoring well location is no longer a part of the compliance monitoring program. Therefore, groundwater samples were not collected during the current monitoring event. Concurrence for discontinuing sampling and analysis at this monitoring well location was provided in an email from Eugene Radcliff, Ecology, to Iain Wingard, GeoEngineers, dated May 16, 2011.

[12] See Footnote 1.

[13] Sample DUP-082312-W is a field duplicate of sample MW3-082312-W.

[14] Groundwater sampling and analysis frequency at this monitoring well location has been reduced from quarterly monitoring to semi-annual monitoring. Concurrence for reducing the sampling and analysis frequency at this monitoring well location was provided in an email from Eugene Radcliff, Ecology, to Iain Wingard, GeoEngineers, dated May 8, 2012.

[15] Sample DUP-022813-W is a field duplicate of sample MW3-022813-W.

[16] Sample DUP01-82213-W is a field duplicate of sample MW03-82213-W.

[17] Sample DUP01-140227-W is a field duplicate of sample MW16-140227-W.

[18] Sample DUP01-140825-W is a field duplicate of sample MW16-140825-W.

MTCA = Model Toxics Control Act

µg/l = microgram per liter

U = The analyte was not detected at a concentration greater than the identified reporting limit

UJ = The analyte was not detected at a concentration greater than the identified reporting limit and the reporting limit concentration is estimated

NA = Not analyzed

mg/l = milligram per liter

J = The analyte concentration is estimated

NC = Not Collected

Bold indicates analyte was detected

Green shading indicates sample results for the current monitoring event.

Gray shading indicates concentration is greater than cleanup level

TABLE 2

SUMMARY OF GROUNDWATER QUALITY PARAMETERS[1] - AUGUST 2014

318 STATE AVENUE NE
OLYMPIA, WASHINGTON

Location ID	Sample Date	Ferrous Iron (mg/l)	Sulfate (mg/l)	Dissolved Oxygen (mg/l)	pH	Conductivity (uS/m)	Salinity (%)	Total Dissolved Solids (g/l)	Turbidity (NTU)	Temperature (C)	ORP[2] (mv)	Water Level (ft btoc)
MW-13 [3]	05/25/10	2.2	6.0	1.23	8.34	15.6	0.1	1	4.74	14.4	-97	2.91
	08/24/10	3.8	1.6	2.21	6.58	99.9	0	0.72	4.16	21.07	-115	3.82
	11/22/10	1.2	8.1	0.98	6.63	40.0	0	0.26	8.97	14.79	6	2.24
	02/22/11	1.0	6.3	0.81	6.56	40.7	0	0.26	0.8	11.12	-43	2.62
	05/25/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.85
	08/24/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.61
	11/29/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.04
	02/28/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.30
MW-04 [3]	05/25/10	4.5	6.7	1.34	7.34	59.5	0	0.38	0.99	13.9	-80	3.29
	08/24/10	3.6	1.2 U	0.72	6.15	64.5	0	0.41	1.82	21.12	-75	4.23
	11/22/10	3.8	3.8	1.97	6.52	37.1	0	0.24	1.8	12.64	-57	2.61
	02/22/11	2.2	2.6	0.99	6.56	25.5	0	0.17	1.08	10.11	-70	2.95
	05/25/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.15
	08/24/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	4.11
	11/29/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.41
	02/28/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.54
MW-17 [6]	05/24/10	0.0	31	1.78	7	45.7	0	0.3	2.49	13.5	-23	3.83
	08/24/10	0.0	28	0.58	7.04	99.9	0	0.79	9.03	21.5	54	4.53
	11/22/10	0.2	28	0.00	7.16	50.9	0	0.33	10.5	15.64	39	3.32
	02/22/11	0.0	36	0.39	6.78	36.4	0	0.24	7.2	11.39	73	3.62
	05/25/11	0.0	23	0.28	6.65	40.4	NC	NC	5.49	12.48	114	3.67
	08/24/11	0.0	11.9	0.40	6.99	54.9	0	0.35	3.54	19.28	239	4.41
	11/29/11	0.0	28	4.80	6.96	33.8	0	0.22	64.7	13.88	192	3.08
	02/28/12	0.0	58 UJ	6.90	6.91	28.1	0	0.18	132	10.49	200	3.31
	08/23/12	0.0	3.7	0.15	6.5	40.1	0	0.25	2.92	18.3	82	4.47
	02/28/13	0.0	7.2	4.10	6.17	39.0	0	0.26	26.8	10.46	195	3.50
	08/22/13	0.0	6.2	0.20	7.14	34.0	0	0.23	7.1	19.9	-200	4.54
	02/27/14	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.07
	08/25/14	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	4.37
MW-09 [3]	05/25/10	1.6	9.1	1.22	8.8	99.9	0	0.6	0.96	14.8	-157	3.65
	08/24/10	2.2	1.2 U	0.99	6.74	145.0	0.1	0.9	1.48	23.16	-89	4.44
	11/22/10	0.4	1.9	1.32	7.01	44.7	0	0.29	1.99	15.08	-76	2.92
	02/22/11	0.4	1.7	0.15	7.06	47.2	0	0.31	0	12.73	-114	3.35
	05/25/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.42
	08/24/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	4.31
	11/29/11	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.60
	02/28/12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.98

Location ID	Sample Date	Ferrous Iron (mg/l)	Sulfate (mg/l)	Dissolved Oxygen (mg/l)	pH	Conductivity (uS/m)	Salinity (%)	Total Dissolved Solids (g/l)	Turbidity (NTU)	Temperature (C)	ORP[2] (mv)	Water Level (ft btoc)
MW-03 [4]	05/24/10	0.9	7.5	4.38	9.79	27.2	0.1	1.4	0.89	16.2	-211	4.27
	08/25/10	1.4	1.2 U	0.31	6.96	75.0	0	0.48	0.94	21.32	-133	4.99
	11/24/10	0.8	6.6	0.00	7.04	66.7	0	0.43	0.84	15.53	-94	3.80
	02/23/11	0.6	2.5	0.01	7.10	46.3	0	0.3	2.51	11.26	-117	4.05
	05/25/11	0.8	2.4	0.01	7.07	46.7	NC	NC	0.59	15.12	-130	4.10
	08/24/11	1.1	1 U	0.40	7.20	72.3	0	0.46	0.44	21.02	-90	4.82
	11/29/11	0.6	11	5.00	7.10	59.0	0	0.38	3.06	13.67	89	3.49
	02/28/12	0.8	40 UJ	2.60	7.25	41.5	0	0.27	5.45	10.99	-59	3.75
	08/23/12	1.0	1.2 U	7.14	6.87	53.0	0	0.34	0.59	21.3	-117	4.92
	02/28/13	1.5	2.1	0.78	6.53	48.0	0	0.31	17.6	11.52	-48	3.98
	08/22/13	1.6	1.2 U	0.10	7.61	61.7	0	0.40	37.4 [5]	23.2	-156	4.98
	02/27/14	0.0	11	3.80	7.30	33.2	0	0.31	0.63	10.3	204.4	3.44
	08/25/14	1.8	1.2 U	0.68	7.25	52.0	0.26	0.35	2.48	22.99	-108.6	4.78
MW-08 [6]	05/24/10	0.3	10.0	1.30	8.45	24.5	0.1	1.6	0.73	14.9	-145	3.45
	08/25/10	3.0	2.5	0.11	7.06	69.2	0	0.44	1.25	21.68	-155	4.50
	11/24/10	0.6	17	2.33	7.21	54.6	0	0.35	1.24	15.08	-67	3.14
	02/23/11	0.0	7.9	2.04	7.27	33.2	0	0.22	4.98	11.59	-37	3.51
	05/25/11	0.0	8.4	0.73	7.16	37.4	NC	NC	1.02	13.85	37	3.59
	08/24/11	1.4	1.6	0.30	7.25	68.6	0	0.44	0.61	20.04	-117	4.39
	11/29/11	1.6	8.9	6.60	7.20	32.5	0	0.21	2.75	12.81	69	2.82
	02/28/12	0.0	47 UJ	8.20	7.37	29.3	0	0.19	18.6	10.26	33	3.21
	08/23/12	0.0	1.7	0.33	6.40	49.9	0	0.33	9.2	19.5	-99	4.39
	02/28/13	0.0	8.1	8.50	6.55	35.7	0	0.23	21.7	11.08	175	3.32
	08/22/13	7.5	2.1	1.86	7.61	56.5	0	0.36	59.5 [5]	23.1	-203	4.39
	02/27/14	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.77
	08/25/14	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	4.32
MW-16 [4]	05/24/10	0.0	20.0	2.44	8.19	26.6	0	0.17	2.9	15.1	-116	4.24
	08/25/10	0.4	42.0	0.04	7.26	69.8	0	0.44	1.2	21.91	-106	5.02
	11/24/10	0.0	28	1.93	7.54	49.8	0	0.36	1.16	15.42	-34	3.68
	02/23/11	0.0	17	5.08	7.53	37.5	0	0.24	2.58	11.53	-9	4.04
	05/25/11	0.0	11	1.02	7.55	33.1	NC	NC	2.28	13.87	64	4.06
	08/24/11	1.2	4.9	1.00	7.66	51.0	0	0.33	1.28	20.26	-56	4.86
	11/29/11	0.4	19	6.20	7.60	35.3	0	0.23	4.00	13.82	96	3.33
	02/28/12	0.0	54 UJ	6.80	7.70	29.8	0	0.19	1.87	10.89	87	3.72
	08/23/12	0.0	3.9	3.21	7.02	31.4	0	0.2	1.22	19.7	-109	4.91
	02/28/13	0.0	7.7	5.86	6.84	29.4	0	0.19	0.40	11.36	115	3.86
	08/22/13	0.0	3.5	0.11	7.93	46.5	0	0.3	62 [5]	22.9	-177	4.91
	02/27/14	0.0	7.3	2.61	7.24	23.6	0	0.21	0.31	10.9	206.2	3.33
	08/25/14	0.5	3.1	0.72	7.59	42.1	0.21	0.28	0.42	22.35	-30.8	4.73
MW-18 [4]	05/24/10	0.0	34.0	3.92	9.16	9.0	0	0.5	1.9	14.3	-194	4.39
	08/25/10	0.2	11.0	0.00	6.81	71.9	0	0.46	4.12	21.82	-75	5.09
	11/24/10	0.0	38	0.01	7.11	47.9	0	0.31	0.61	15.52	39	3.87
	02/23/11	0.0	23	0.17	7.22	40.3	0	0.26	0.99	11.7	55	4.15
	05/25/11	0.0	17	0.00	7.15	40.8	NC	NC	1.07	12.8	31	4.21
	08/24/11	0.2	18.5	0.50	7.33	74.1	0	0.47	0.48	19.54	-48	4.97
	11/29/11	0.4	23	3.50	6.81	34.3	0	0.22	2.82	13.18	183	3.53
	02/28/12	0.0	67 UJ	8.20	7.21	32.9	0	0.21	1.56	10.33	93	3.87
	08/23/12	1.0	7.5	4.03	7.08	53.4	0	0.34	3	18.2	-110	5.02
	02/28/13	0.0	7.4	5.68	6.05	21.1	0	0.14	7	10.94	182	4.02
	08/22/13	1.1	4.1	1.90	7.72	59.3	0	0.38	54.8 [5]	20.9	-153	5.04
	02/27/14	0.0	11	3.00	7.1	22.2	0	0.2	0.48	10.6	201.3	3.52
	08/25/14	0.8	1.2 U	2.02	9.23	46.7	0.25	0.33	2.79	20.37	-102.9	4.85

Notes:

[1] Groundwater quality parameters include the analytes ferrous iron and sulfate to evaluate and monitor natural attenuation.

[2] ORP field readings are considered to be an estimate.

[3] Groundwater sampling and analysis at this monitoring well location is no longer a part of the compliance monitoring program. Therefore, groundwater quality parameters were not collected during the current monitoring event. However, the water level was collected to monitor the groundwater gradient. Concurrence for discontinuing sampling and analysis at this monitoring well location was provided in an email from Eugene Radcliff, Ecology, to Iain Wingard, GeoEngineers, dated May 16, 2011.

[4] Groundwater sampling and analysis frequency at this monitoring well location has been reduced from quarterly monitoring to semi-annual monitoring. Concurrence for reducing the sampling and analysis frequency at this monitoring well location was provided in an email from Eugene Radcliff, Ecology, to Iain Wingard, GeoEngineers, dated May 8, 2012.

[5] Turbidity measurements collected at this compliance monitoring location are considered to be biased high due to a water quality equipment malfunction. Visual observation made at the time of sampling identified that the sample was clear and free of particulates.

[6] Groundwater sampling and analysis at this monitoring well location is no longer a part of the compliance monitoring program. Therefore, groundwater quality parameters were not collected during the current monitoring event. However, the water level was collected to monitor the groundwater gradient. Concurrence for discontinuing sampling and analysis at this monitoring well location was provided in an email from Eugene Radcliff, Ecology, to Iain Wingard, GeoEngineers, dated November 4, 2013.

ORP = Oxidation/reduction potential

mg/l = milligrams per liter

g/l = grams per liter

% = percent

mv = Millivolts

uS/m = microSiemens per meter

C = Celsius

U = The analyte was not detected at a concentration greater than the identified reporting limit

NTU = nephelometric turbidity unit

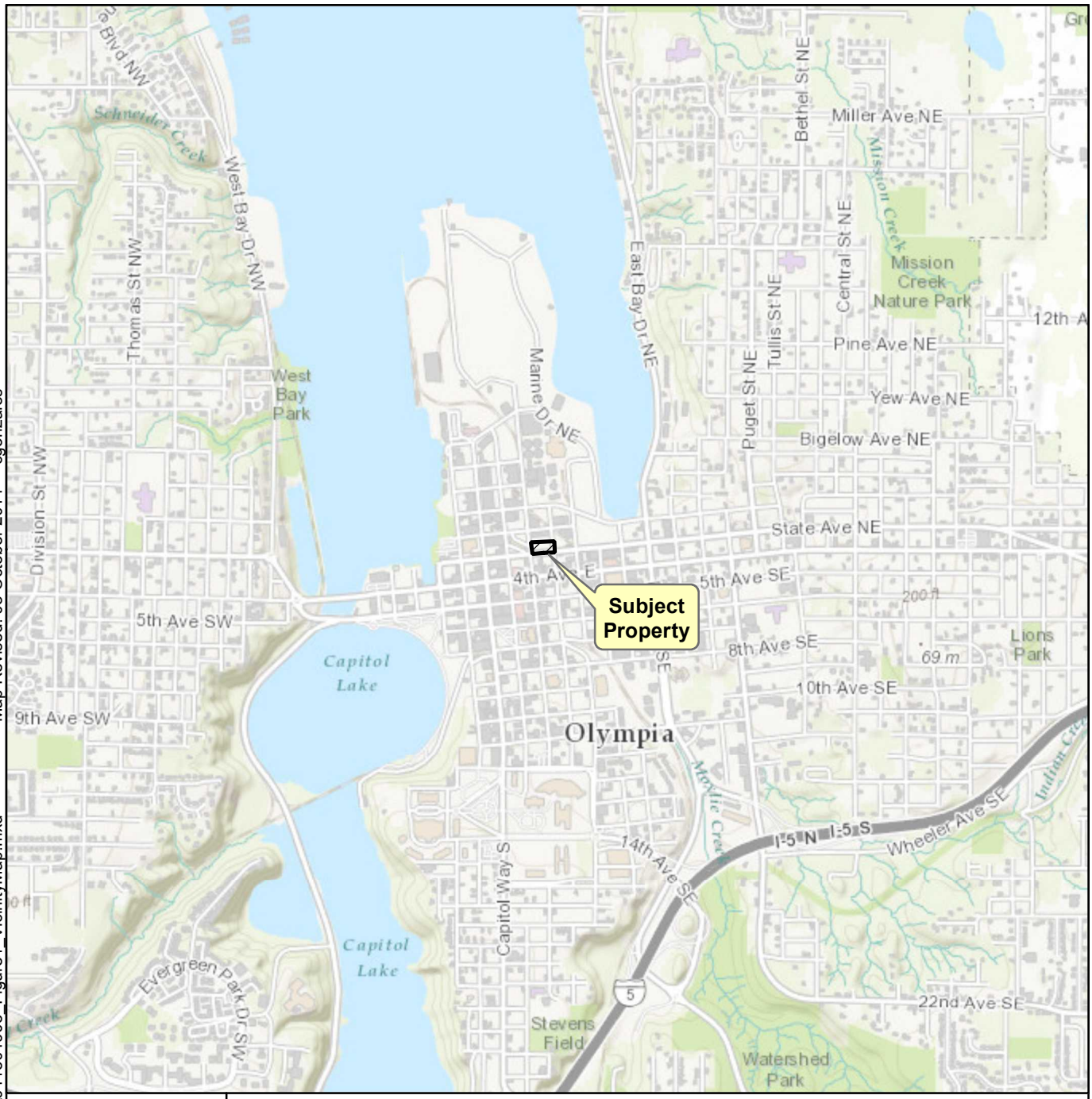
NC = Not Collected

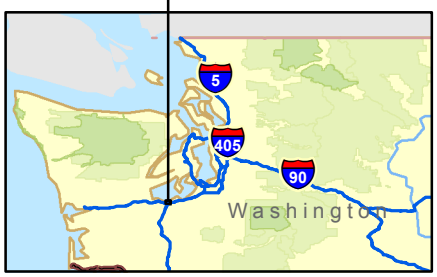
Green shading indicates sample results for current quarter of monitoring.

ft btoc = feet below the top of monitoring well casing

J = Analyte concentration is estimated.

NS = Not Sampled. Monitoring well location no longer a part of compliance monitoring program. See Footnote 3.





N
W E
S

3,000 0 3,000

Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: 2008 Shaded Relief from ESRI, 2008 Topographic Maps from National Geographic Society
Projection: NAD_1983_StatePlane_Washington_North_FIPS_4601_Feet
Datum: D_North_American_1983

Vicinity Map

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 1

Office: TAC Path: \\tac\projects\0\0415049\GIS\MXDs\0415049003_Figure1_VicinityMap.mxd Map Revised: 08 October 2014 cgonzales

Legend

- MW-03 — Existing Monitoring Well Sampled for Groundwater Analysis and used to monitor Groundwater Gradients
- MW-01 — Existing Monitoring Well Previously Sampled for Groundwater Analysis and to Monitor Groundwater Gradients
- CSZ 1 — Contaminated Soil Zones (CSZ) Remediated in September-October 2009
- Approximate Property Boundary

N W E S

40 0 40
Feet

Groundwater Compliance Monitoring Locations

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 2

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Sources: Approximate Property Boundary from Thurston County parcels (revised by GeoEngineers).
Aerial photograph (2009) from Thurston County Data Center. Data Frame Rotated 356 degrees.

Projection: NAD_1983_StatePlane_Washington_South_FIPS_4602_Feet
Datum: D_North_American_1983

Map Revised: 08 October 2014 cgonzales
Path: \\tac\projects\0\0415049\GIS\MXDs\041504906_F2_GW_MW_LOCATIONS_Oct14.mxd
Office: TAC

Legend

- MW-03 — Monitoring Well Sampled for Groundwater Analysis and used to Monitor Groundwater levels
- MW-01 — Existing Monitoring Well Previously Sampled for Groundwater Analysis and to Monitor Groundwater levels
- Vinyl Chloride at concentrations greater than MTCA Method A (0.2 ug/l)
- CSZ 1 — Contaminated Soil Zones (CSZ) Remediated in September-October 2009
- Approximate Property Boundary

Well	Event	Result
MW-3		
Vinyl Chloride	August 2014	0.25 µg/L
MW-16		
Vinyl Chloride	August 2014	0.52 µg/L
MW-18		
Vinyl Chloride	August 2014	2.7 µg/L

N
W E
S

40 0 40
Feet

Notes:
1. MTCA = Model Toxics Control Act, ug/L = micrograms per liter.
2. The locations of all features shown are approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Sources: Approximate Property Boundary from Thurston County parcels (revised by GeoEngineers).
Aerial photograph 2013 from ESRI. Data Frame Rotated 356 degrees.

Projection: NAD_1983_StatePlane_Washington_South_FIPS_4602_Feet
Datum: D_North_American_1983

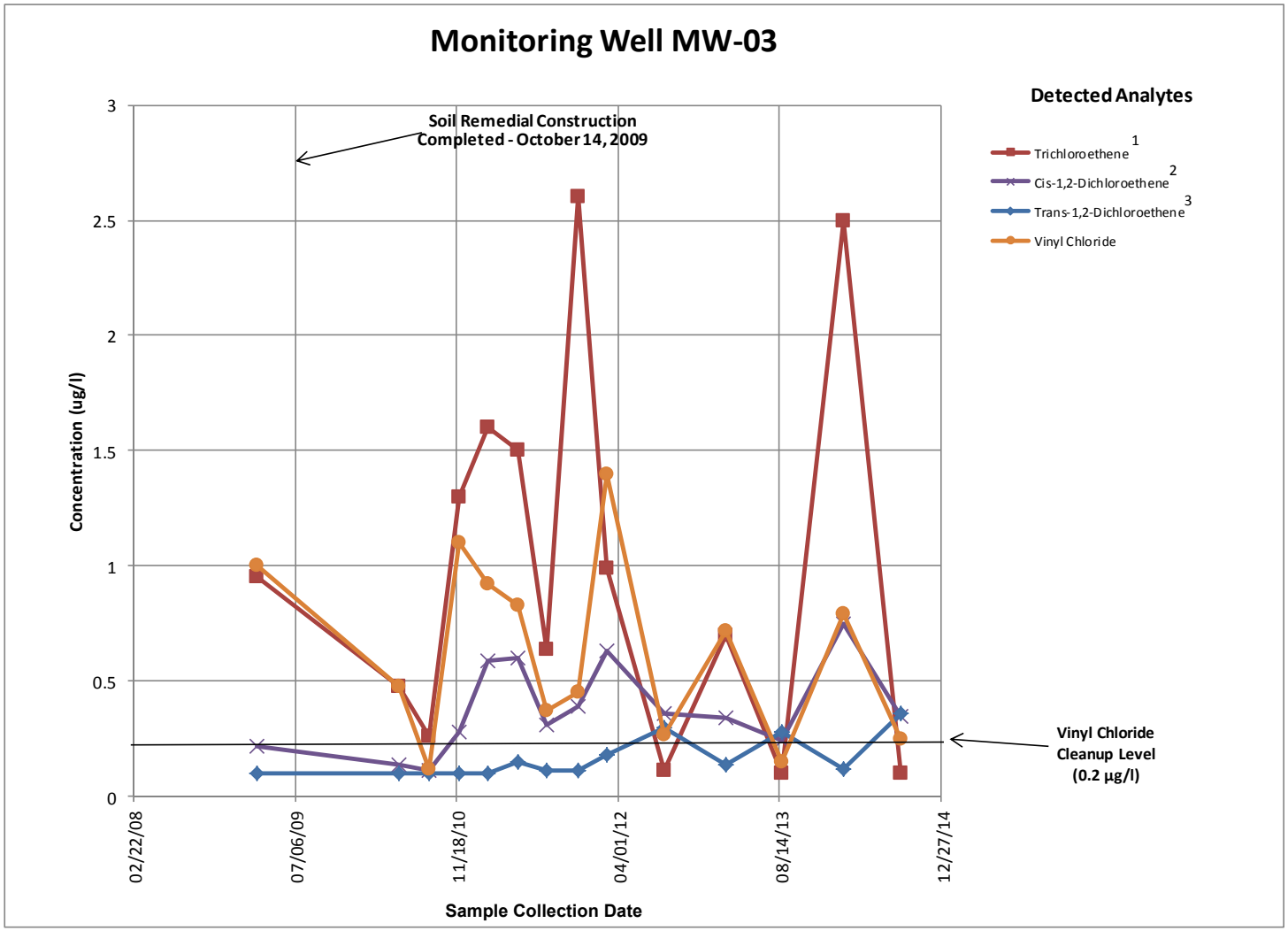
Chemical Analytical Results Exceeding Groundwater Compliance Criteria

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 3

Office: TAC Path: \\tac\projects\00415049\GIS\MXDs\041504906_F3_CHEM_EXCEEDANCES_Oct2014.mxd Map Revised: 08 October 2014 cgonzales



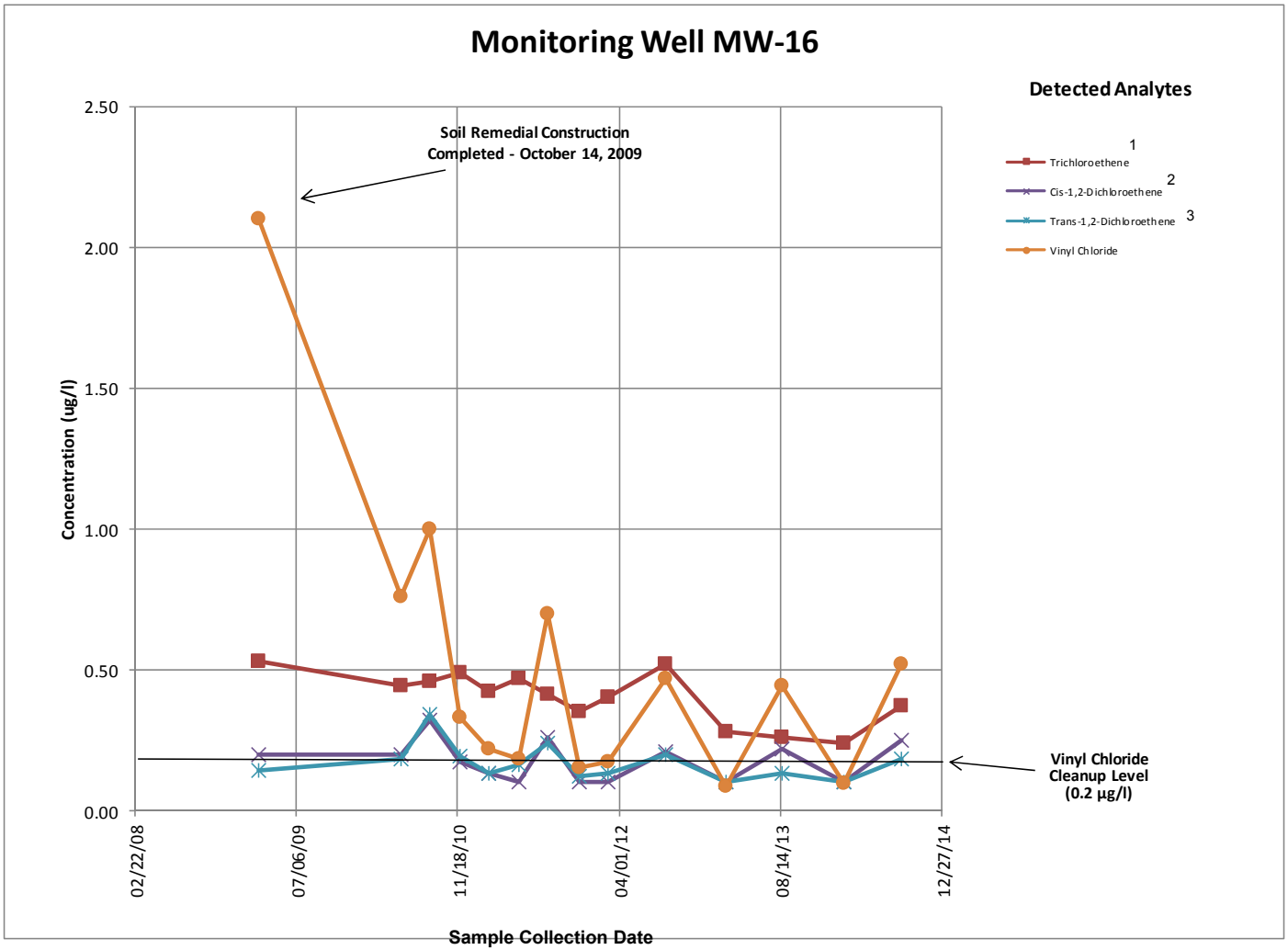
Notes:
[1] The concentrations of trichloroethene (TCE) are less than the TCE cleanup level of 5 µg/l.
[2] The concentrations of Cis-1,2-Dichloroethene (Cis-DCE) are less than the Cis-DCE cleanup level of 800,000 µg/l.
[3] The concentrations of trans-1,2-Dichloroethene (trans-DCE) are less than the trans-DCE cleanup level of 1,600,000 µg/l.

Trend Analysis – August 2014

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 4



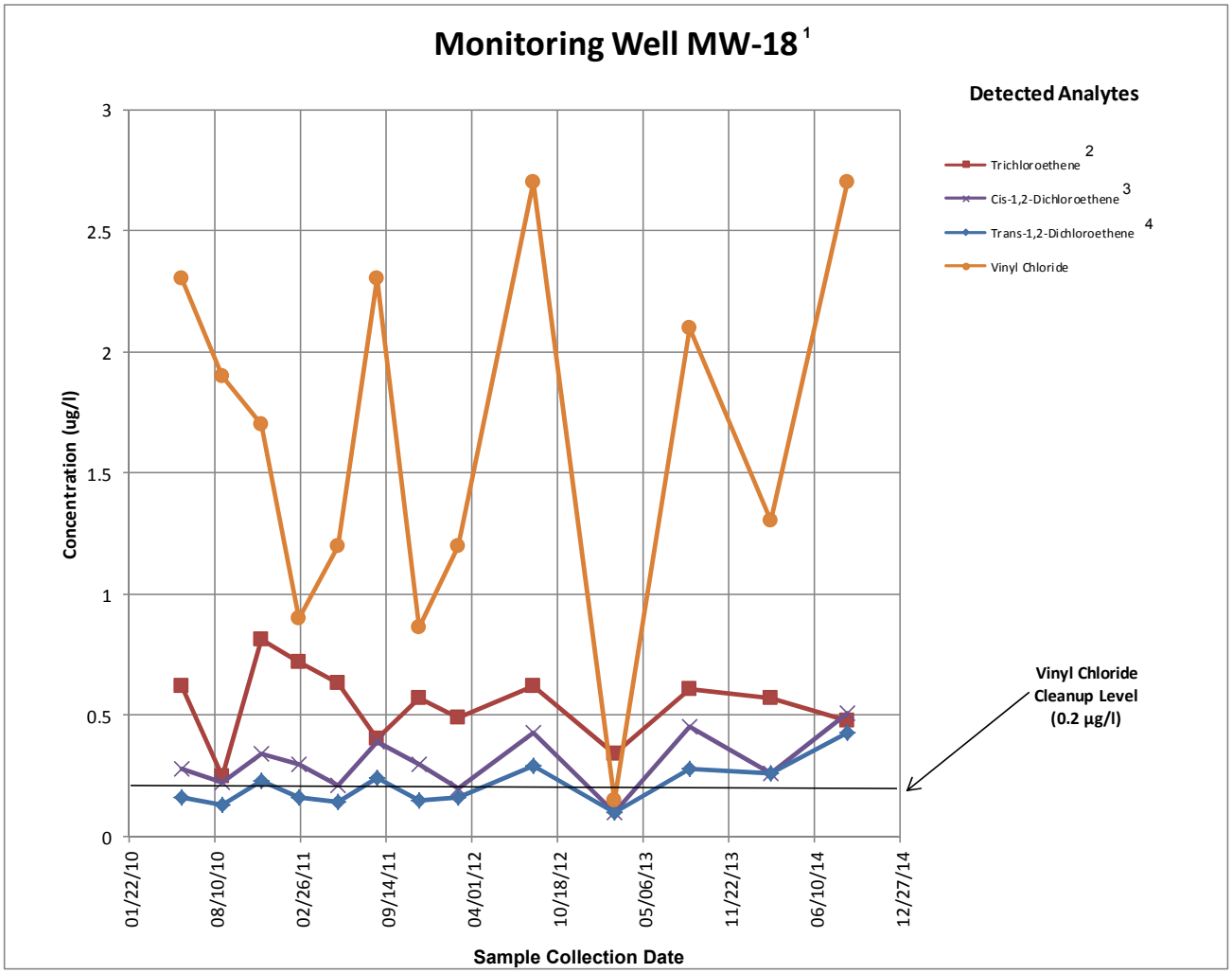
Notes:
[1] The concentrations of trichloroethene (TCE) are less than the TCE cleanup level of 5 µg/l.
[2] The concentrations of Cis-1,2-Dichloroethene (Cis-DCE) are less than the Cis-DCE cleanup level of 800,000 µg/l.
[3] The concentrations of trans-1,2-Dichloroethene (trans-DCE) are less than the trans-DCE cleanup level of 1,600,000 µg/l.

Trend Analysis – August 2014

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 5



Notes:
[1] MW-18 was installed after remedial actions for soil were completed on October 14, 2009.
[2] The concentrations of trichloroethene (TCE) are less than the TCE cleanup level of 5 µg/l.
[3] The concentrations of Cis-1,2-Dichloroethene (Cis-DCE) are less than the cis-DCE cleanup level of 800,000 µg/l.
[4] The concentrations of trans-1,2-Dichloroethene (trans-DCE) are less than the trans-DCE cleanup level of 1,600,000 µg/l.

Trend Analysis – August 2014

318 State Avenue NE
Olympia, Washington

GeoEngineers

Figure 6

APPENDIX A
Laboratory Reports

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

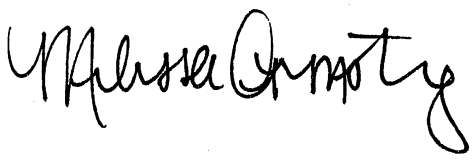
ANALYTICAL REPORT

Job Number: 580-45117-1

Job Description: 318 State AVE NE (WA)

For:
GeoEngineers Inc
1101 Fawcett, Suite 200
Tacoma, WA 98402

Attention: Mr. Iain Wingard



Approved for release.
Melissa A Armstrong
Project Manager II
9/9/2014 3:42 PM

Melissa A Armstrong, Project Manager II
5755 8th Street East, Tacoma, WA, 98424
(253)248-4975
melissa.armstrong@testamericainc.com
09/09/2014

cc: Nick Rohrbach

TestAmerica Tacoma is a part of TestAmerica Laboratories, Inc.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan and meet all requirements of NELAC. All data have been found to be compliant with laboratory protocol, with the exception of any items noted in the case narrative.

Table of Contents

Table of Contents

CASE NARRATIVE

Client: GeoEngineers Inc
Project: 318 State AVE NE (WA)
Report Number: 580-45117-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 8/25/2014 5:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.9º C.

Except:
The container labels and Chain of Custody (COC) for the following samples MW18-140825-W (580-45117-4 MS) and MW18-140825-W (580-45117-4 MSD) have different times than their parent sample MW18-140825-W (580-45117-4). All samples were logged in with the parent sample time of 15:50.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

VOLATILE ORGANIC COMPOUNDS (GC-MS) LOW LEVEL
Samples DUP01-140825-W (580-45117-1), MW16-140825-W (580-45117-2), MW03-140825-W (580-45117-3), MW18-140825-W (580-45117-4) and Trip Blank (580-45117-5) were analyzed for volatile organic compounds (GC-MS) low level in accordance with EPA SW-846 8260B. The samples were analyzed on 08/28/2014 and 08/29/2014.

Sample DUP01-140825-W (580-45117-1) was reanalyzed for cis-1,2-Dichloroethene, Tetrachloroethene and Trichloroethene due to potential carryover from a highly contaminated sample in the original analysis.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS
Samples DUP01-140825-W (580-45117-1), MW16-140825-W (580-45117-2), MW03-140825-W (580-45117-3) and MW18-140825-W (580-45117-4) were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 08/29/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Instrument ID: SEA015 Analysis Batch Number: 168147

Lab Sample ID: STD00002 580-168147/3 IC Client Sample ID:

Date Analyzed: 08/26/14 16:18 Lab File ID: I0344143.D GC Column: ZB-624short ID: 0.18(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
1,2-Dichlorobenzene		Unspecified		
1,2-Dichloroethane		Unspecified		
2-Methyl-2-propanol		Unspecified		
Acrolein		Unspecified		
Acrylonitrile		Unspecified		
Bromomethane		Unspecified		
Chlorobromomethane		Unspecified		
Chloroethane		Unspecified		
Chloromethane		Unspecified		
Methyl tert-butyl ether		Unspecified		
n-Hexane		Unspecified		
Toluene		Unspecified		
trans-1,2-Dichloroethene		Unspecified		
Trichlorofluoromethane		Unspecified		

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Instrument ID: SEA015 Analysis Batch Number: 168317

Lab Sample ID: 580-45117-1 Client Sample ID: DUP01-140825-W

Date Analyzed: 08/28/14 20:58 Lab File ID: I0344210.D GC Column: ZB-624short ID: 0.18(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
1,1-Dichloroethene		Unspecified		

GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Instrument ID: SEA015 Analysis Batch Number: 168393

Lab Sample ID: MB 580-168393/7 Client Sample ID:

Date Analyzed: 08/29/14 09:28 Lab File ID: I0344220.D GC Column: ZB-624short ID: 0.18(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Trichloroethene		Unspecified		

SAMPLE SUMMARY

Client: GeoEngineers Inc

Job Number: 580-45117-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
580-45117-1	DUP01-140825-W	Water	08/25/2014 1200	08/25/2014 1720
580-45117-2	MW16-140825-W	Water	08/25/2014 1325	08/25/2014 1720
580-45117-3	MW03-140825-W	Water	08/25/2014 1440	08/25/2014 1720
580-45117-4	MW18-140825-W	Water	08/25/2014 1550	08/25/2014 1720
580-45117-4MS	MW18-140825-W	Water	08/25/2014 1550	08/25/2014 1720
580-45117-4MSD	MW18-140825-W	Water	08/25/2014 1550	08/25/2014 1720
580-45117-5	Trip Blank	Water	08/25/2014 0000	08/25/2014 1720

METHOD SUMMARY

Client: GeoEngineers Inc

Job Number: 580-45117-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Volatile Organic Compounds (GC/MS)	TAL SEA	SW846 8260B	
Purge and Trap	TAL SEA		SW846 5030B
Anions, Ion Chromatography	TAL SEA	MCAWW 300.0	

Lab References:

TAL SEA = TestAmerica Seattle

Method References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Client: GeoEngineers Inc

Job Number: 580-45117-1

Client Sample ID: **DUP01-140825-W**

Lab Sample ID: 580-45117-1
Client Matrix: Water

Date Sampled: 08/25/2014 1200
Date Received: 08/25/2014 1720

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	580-168317	Instrument ID:	SEA015
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	I0344210.D
Dilution:	1.0			Initial Weight/Volume:	10 mL
Analysis Date:	08/28/2014 2058			Final Weight/Volume:	10 mL
Prep Date:	08/28/2014 2058				

Analyte	Result (ug/L)	Qualifier	RL	RL
1,1-Dichloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	0.19		0.10	0.10
Vinyl chloride	0.51		0.020	0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	97		75 - 120
Trifluorotoluene (Surr)	88		80 - 127
Toluene-d8 (Surr)	102		75 - 125
Dibromofluoromethane (Surr)	96		85 - 115
1,2-Dichloroethane-d4 (Surr)	99		70 - 128

Client: GeoEngineers Inc

Job Number: 580-45117-1

Client Sample ID: **DUP01-140825-W**

Lab Sample ID: 580-45117-1
Client Matrix: Water

Date Sampled: 08/25/2014 1200
Date Received: 08/25/2014 1720

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	580-168393	Instrument ID:	SEA015
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	I0344225.D
Dilution:	1.0			Initial Weight/Volume:	10 mL
Analysis Date:	08/29/2014 1141	Run Type:	RA	Final Weight/Volume:	10 mL
Prep Date:	08/29/2014 1141				

Analyte	Result (ug/L)	Qualifier	RL	RL
cis-1,2-Dichloroethene	0.25		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
Trichloroethene	0.36		0.10	0.10

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	96		75 - 120
Trifluorotoluene (Surr)	93		80 - 127
Toluene-d8 (Surr)	100		75 - 125
Dibromofluoromethane (Surr)	96		85 - 115
1,2-Dichloroethane-d4 (Surr)	100		70 - 128

Client: GeoEngineers Inc

Job Number: 580-45117-1

Client Sample ID: **MW16-140825-W**

Lab Sample ID: 580-45117-2
Client Matrix: Water

Date Sampled: 08/25/2014 1325
Date Received: 08/25/2014 1720

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	580-168393	Instrument ID:	SEA015
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	I0344226.D
Dilution:	1.0			Initial Weight/Volume:	10 mL
Analysis Date:	08/29/2014 1205			Final Weight/Volume:	10 mL
Prep Date:	08/29/2014 1205				

Analyte	Result (ug/L)	Qualifier	RL	RL
cis-1,2-Dichloroethene	0.25		0.10	0.10
1,1-Dichloroethene	ND		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	0.18		0.10	0.10
Trichloroethene	0.37		0.10	0.10
Vinyl chloride	0.52		0.020	0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	96		75 - 120
Trifluorotoluene (Surr)	93		80 - 127
Toluene-d8 (Surr)	101		75 - 125
Dibromofluoromethane (Surr)	99		85 - 115
1,2-Dichloroethane-d4 (Surr)	102		70 - 128

Client: GeoEngineers Inc

Job Number: 580-45117-1

Client Sample ID: **MW03-140825-W**

Lab Sample ID: 580-45117-3
Client Matrix: Water

Date Sampled: 08/25/2014 1440
Date Received: 08/25/2014 1720

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	580-168393	Instrument ID:	SEA015
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	I0344227.D
Dilution:	1.0			Initial Weight/Volume:	10 mL
Analysis Date:	08/29/2014 1229			Final Weight/Volume:	10 mL
Prep Date:	08/29/2014 1229				

Analyte	Result (ug/L)	Qualifier	RL	RL
cis-1,2-Dichloroethene	0.35		0.10	0.10
1,1-Dichloroethene	ND		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	0.36		0.10	0.10
Trichloroethene	ND		0.10	0.10
Vinyl chloride	0.25		0.020	0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	97		75 - 120
Trifluorotoluene (Surr)	90		80 - 127
Toluene-d8 (Surr)	100		75 - 125
Dibromofluoromethane (Surr)	96		85 - 115
1,2-Dichloroethane-d4 (Surr)	103		70 - 128

Client: GeoEngineers Inc

Job Number: 580-45117-1

Client Sample ID: **MW18-140825-W**

Lab Sample ID: 580-45117-4
Client Matrix: Water

Date Sampled: 08/25/2014 1550
Date Received: 08/25/2014 1720

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	580-168393	Instrument ID:	SEA015
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	I0344228.D
Dilution:	1.0			Initial Weight/Volume:	10 mL
Analysis Date:	08/29/2014 1300			Final Weight/Volume:	10 mL
Prep Date:	08/29/2014 1300				

Analyte	Result (ug/L)	Qualifier	RL	RL
cis-1,2-Dichloroethene	0.51		0.10	0.10
1,1-Dichloroethene	ND		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	0.43		0.10	0.10
Trichloroethene	0.48		0.10	0.10
Vinyl chloride	2.7		0.020	0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	99		75 - 120
Trifluorotoluene (Surr)	92		80 - 127
Toluene-d8 (Surr)	100		75 - 125
Dibromofluoromethane (Surr)	95		85 - 115
1,2-Dichloroethane-d4 (Surr)	102		70 - 128

Client: GeoEngineers Inc

Job Number: 580-45117-1

Client Sample ID: **Trip Blank**

Lab Sample ID: 580-45117-5
Client Matrix: Water

Date Sampled: 08/25/2014 0000
Date Received: 08/25/2014 1720

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	580-168317	Instrument ID:	SEA015
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	I0344197.D
Dilution:	1.0			Initial Weight/Volume:	10 mL
Analysis Date:	08/28/2014 1539			Final Weight/Volume:	10 mL
Prep Date:	08/28/2014 1539				

Analyte	Result (ug/L)	Qualifier	RL	RL
cis-1,2-Dichloroethene	ND		0.10	0.10
1,1-Dichloroethene	ND		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	ND		0.10	0.10
Trichloroethene	ND		0.10	0.10
Vinyl chloride	ND		0.020	0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	98		75 - 120
Trifluorotoluene (Surr)	89		80 - 127
Toluene-d8 (Surr)	102		75 - 125
Dibromofluoromethane (Surr)	96		85 - 115
1,2-Dichloroethane-d4 (Surr)	98		70 - 128

General Chemistry

Client Sample ID: **DUP01-140825-W**

Lab Sample ID: 580-45117-1 Date Sampled: 08/25/2014 1200

Client Matrix: Water Date Received: 08/25/2014 1720

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	3.0		mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-168473 Analysis Date: 08/29/2014 0926

Client: GeoEngineers Inc

Job Number: 580-45117-1

General Chemistry

Client Sample ID: **MW16-140825-W**

Lab Sample ID: 580-45117-2

Client Matrix: Water

Date Sampled: 08/25/2014 1325

Date Received: 08/25/2014 1720

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	3.1		mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-168473 Analysis Date: 08/29/2014 0941

General Chemistry

Client Sample ID: **MW03-140825-W**

Lab Sample ID: 580-45117-3 Date Sampled: 08/25/2014 1440

Client Matrix: Water Date Received: 08/25/2014 1720

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	ND		mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-168473 Analysis Date: 08/29/2014 0955

General Chemistry

Client Sample ID: **MW18-140825-W**

Lab Sample ID: 580-45117-4 Date Sampled: 08/25/2014 1550

Client Matrix: Water Date Received: 08/25/2014 1720

Analyte	Result	Qual	Units	RL	RL	Dil	Method
Sulfate	ND		mg/L	1.2	1.2	1.0	300.0

Analysis Batch: 580-168473 Analysis Date: 08/29/2014 1009

Client: GeoEngineers Inc

Job Number: 580-45117-1

Surrogate Recovery Report

8260B Volatile Organic Compounds (GC/MS)

Client Matrix: Water

Lab Sample ID	Client Sample ID	DBFM %Rec	DCA %Rec	TFT %Rec	TOL %Rec	BFB %Rec
580-45117-1	DUP01-140825-W	96	99	88	102	97
580-45117-1 RA	DUP01-140825-W RA	96	100	93	100	96
580-45117-2	MW16-140825-W	99	102	93	101	96
580-45117-3	MW03-140825-W	96	103	90	100	97
580-45117-4	MW18-140825-W	95	102	92	100	99
580-45117-5	Trip Blank	96	98	89	102	98
MB 580-168317/7		98	99	86	100	97
MB 580-168393/7		99	100	80	101	98
LCS 580-168317/8		100	98	91	103	104
LCS 580-168393/8		104	100	101	103	102
LCSD 580-168317/9		102	96	96	102	102
LCSD 580-168393/9		103	98	100	100	104
580-45117-4 MS	MW18-140825-W MS	98	96	102	103	105
580-45117-4 MSD	MW18-140825-W MSD	98	98	99	102	99

Surrogate	Acceptance Limits
DBFM = Dibromofluoromethane (Surr)	85-115
DCA = 1,2-Dichloroethane-d4 (Surr)	70-128
TFT = Trifluorotoluene (Surr)	80-127
TOL = Toluene-d8 (Surr)	75-125
BFB = 4-Bromofluorobenzene (Surr)	75-120

Client: GeoEngineers Inc

Job Number: 580-45117-1

Method Blank - Batch: 580-168317

Method: 8260B
Preparation: 5030B

Lab Sample ID:	MB 580-168317/7	Analysis Batch:	580-168317	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0344190.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	08/28/2014 1248	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	08/28/2014 1248				
Leach Date:	N/A				

Analyte	Result	Qual	RL	RL
cis-1,2-Dichloroethene	ND		0.10	0.10
1,1-Dichloroethene	ND		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	ND		0.10	0.10
Trichloroethene	ND		0.10	0.10
Vinyl chloride	ND		0.020	0.020

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	97	75 - 120
Trifluorotoluene (Surr)	86	80 - 127
Toluene-d8 (Surr)	100	75 - 125
Dibromofluoromethane (Surr)	98	85 - 115
1,2-Dichloroethane-d4 (Surr)	99	70 - 128

Client: GeoEngineers Inc

Job Number: 580-45117-1

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 580-168317

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 580-168317/8	Analysis Batch:	580-168317	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0344191.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	08/28/2014 1312	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	08/28/2014 1312				10 mL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 580-168317/9	Analysis Batch:	580-168317	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0344192.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	08/28/2014 1336	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	08/28/2014 1336				10 mL
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
cis-1,2-Dichloroethene	103	107	80 - 130	4	20		
1,1-Dichloroethene	104	104	70 - 150	0	20		
Tetrachloroethene	101	106	40 - 180	4	20		
trans-1,2-Dichloroethene	108	109	80 - 140	1	20		
Trichloroethene	104	105	80 - 130	1	20		
Vinyl chloride	106	110	65 - 140	4	20		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	104	102	75 - 120
Trifluorotoluene (Surr)	91	96	80 - 127
Toluene-d8 (Surr)	103	102	75 - 125
Dibromofluoromethane (Surr)	100	102	85 - 115
1,2-Dichloroethane-d4 (Surr)	98	96	70 - 128

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 580-168317

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 580-168317/8	Units:	ug/L	LCSD Lab Sample ID:	LCSD 580-168317/9
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	08/28/2014 1312			Analysis Date:	08/28/2014 1336
Prep Date:	08/28/2014 1312			Prep Date:	08/28/2014 1336
Leach Date:	N/A			Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
cis-1,2-Dichloroethene	5.00	5.00	5.17	5.37
1,1-Dichloroethene	5.00	5.00	5.19	5.21
Tetrachloroethene	5.00	5.00	5.07	5.28
trans-1,2-Dichloroethene	5.00	5.00	5.40	5.45
Trichloroethene	5.00	5.00	5.21	5.27
Vinyl chloride	5.00	5.00	5.31	5.51

Client: GeoEngineers Inc

Job Number: 580-45117-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-168317

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	580-45117-4	Analysis Batch:	580-168317	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0344193.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	08/28/2014 1401			Final Weight/Volume:	10 mL
Prep Date:	08/28/2014 1401				10 mL
Leach Date:	N/A				

MSD Lab Sample ID:	580-45117-4	Analysis Batch:	580-168317	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0344194.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	08/28/2014 1425			Final Weight/Volume:	10 mL
Prep Date:	08/28/2014 1425				10 mL
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
cis-1,2-Dichloroethene	104	100	71 - 144	3	20		
1,1-Dichloroethene	102	103	78 - 151	1	30		
Tetrachloroethene	66	65	64 - 161	2	20		
trans-1,2-Dichloroethene	105	104	73 - 135	0	20		
Trichloroethene	106	102	79 - 131	3	30		
Vinyl chloride	110	105	47 - 160	3	20		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	105	99	75 - 120
Trifluorotoluene (Surr)	102	99	80 - 127
Toluene-d8 (Surr)	103	102	75 - 125
Dibromofluoromethane (Surr)	98	98	85 - 115
1,2-Dichloroethane-d4 (Surr)	96	98	70 - 128

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-168317

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	580-45117-4	Units:	ug/L	MSD Lab Sample ID:	580-45117-4
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	08/28/2014 1401			Analysis Date:	08/28/2014 1425
Prep Date:	08/28/2014 1401			Prep Date:	08/28/2014 1425
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
cis-1,2-Dichloroethene	0.51	5.00	5.00	5.71	5.52
1,1-Dichloroethene	ND	5.00	5.00	5.08	5.15
Tetrachloroethene	ND	5.00	5.00	3.30	3.23
trans-1,2-Dichloroethene	0.43	5.00	5.00	5.67	5.65
Trichloroethene	0.48	5.00	5.00	5.76	5.57
Vinyl chloride	2.7	5.00	5.00	8.18	7.91

Client: GeoEngineers Inc

Job Number: 580-45117-1

Method Blank - Batch: 580-168393

Method: 8260B
Preparation: 5030B

Lab Sample ID:	MB 580-168393/7	Analysis Batch:	580-168393	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0344220.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	08/29/2014 0928	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	08/29/2014 0928				
Leach Date:	N/A				

Analyte	Result	Qual	RL	RL
cis-1,2-Dichloroethene	ND		0.10	0.10
1,1-Dichloroethene	ND		0.10	0.10
Tetrachloroethene	ND		0.10	0.10
trans-1,2-Dichloroethene	ND		0.10	0.10
Trichloroethene	ND		0.10	0.10
Vinyl chloride	ND		0.020	0.020

Surrogate	% Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	98	75 - 120
Trifluorotoluene (Surr)	80	80 - 127
Toluene-d8 (Surr)	101	75 - 125
Dibromofluoromethane (Surr)	99	85 - 115
1,2-Dichloroethane-d4 (Surr)	100	70 - 128

Client: GeoEngineers Inc

Job Number: 580-45117-1

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 580-168393

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 580-168393/8	Analysis Batch:	580-168393	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0344221.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	08/29/2014 0952	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	08/29/2014 0952				10 mL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 580-168393/9	Analysis Batch:	580-168393	Instrument ID:	SEA015
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	I0344222.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	08/29/2014 1016	Units:	ug/L	Final Weight/Volume:	10 mL
Prep Date:	08/29/2014 1016				10 mL
Leach Date:	N/A				

Analyte	% Rec. LCS	% Rec. LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
cis-1,2-Dichloroethene	112	114	80 - 130	2	20		
1,1-Dichloroethene	111	111	70 - 150	0	20		
Tetrachloroethene	78	86	40 - 180	10	20		
trans-1,2-Dichloroethene	113	110	80 - 140	3	20		
Trichloroethene	107	105	80 - 130	2	20		
Vinyl chloride	115	111	65 - 140	4	20		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
4-Bromofluorobenzene (Surr)	102	104	75 - 120
Trifluorotoluene (Surr)	101	100	80 - 127
Toluene-d8 (Surr)	103	100	75 - 125
Dibromofluoromethane (Surr)	104	103	85 - 115
1,2-Dichloroethane-d4 (Surr)	100	98	70 - 128

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 580-168393

Method: 8260B
Preparation: 5030B

LCS Lab Sample ID:	LCS 580-168393/8	Units:	ug/L	LCSD Lab Sample ID:	LCSD 580-168393/9
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	08/29/2014 0952			Analysis Date:	08/29/2014 1016
Prep Date:	08/29/2014 0952			Prep Date:	08/29/2014 1016
Leach Date:	N/A			Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
cis-1,2-Dichloroethene	5.00	5.00	5.59	5.69
1,1-Dichloroethene	5.00	5.00	5.55	5.57
Tetrachloroethene	5.00	5.00	3.92	4.32
trans-1,2-Dichloroethene	5.00	5.00	5.65	5.50
Trichloroethene	5.00	5.00	5.37	5.24
Vinyl chloride	5.00	5.00	5.76	5.56

Client: GeoEngineers Inc

Job Number: 580-45117-1

Method Blank - Batch: 580-168473

Method: 300.0
Preparation: N/A

Lab Sample ID:	MB 580-168473/3	Analysis Batch:	580-168473	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	13.0000.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	08/29/2014 0800	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	RL	RL
Sulfate	ND		1.2	1.2

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 580-168473

Method: 300.0
Preparation: N/A

LCS Lab Sample ID:	LCS 580-168473/4	Analysis Batch:	580-168473	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	14.0000.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	08/29/2014 0814	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 580-168473/5	Analysis Batch:	580-168473	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	15.0000.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	08/29/2014 0828	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Sulfate	98	98	90 - 110	0	15		

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 580-168473

Method: 300.0
Preparation: N/A

LCS Lab Sample ID:	LCS 580-168473/4	Units:	mg/L	LCSD Lab Sample ID:	LCSD 580-168473/5
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	08/29/2014 0814			Analysis Date:	08/29/2014 0828
Prep Date:	N/A			Prep Date:	N/A
Leach Date:	N/A			Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Sulfate	12.0	12.0	11.8	11.8

Client: GeoEngineers Inc

Job Number: 580-45117-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-168473

Method: 300.0
Preparation: N/A

MS Lab Sample ID:	580-45117-4	Analysis Batch:	580-168473	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	21.0000.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	08/29/2014 1038			Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

MSD Lab Sample ID:	580-45117-4	Analysis Batch:	580-168473	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	22.0000.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	08/29/2014 1053			Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Sulfate	101	102	90 - 110	1	15		

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 580-168473

Method: 300.0
Preparation: N/A

MS Lab Sample ID:	580-45117-4	Units:	mg/L	MSD Lab Sample ID:	580-45117-4
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	08/29/2014 1038			Analysis Date:	08/29/2014 1053
Prep Date:	N/A			Prep Date:	N/A
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Sulfate	ND	12.0	12.0	12.1	12.2

Duplicate - Batch: 580-168473

Method: 300.0
Preparation: N/A

Lab Sample ID:	580-45117-4	Analysis Batch:	580-168473	Instrument ID:	TAC044
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	20.0000.TXT
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	08/29/2014 1024	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Sulfate	ND	ND	NC	10	

DATA REPORTING QUALIFIERS

Lab Section	Qualifier	Description

Client: GeoEngineers Inc

Job Number: 580-45117-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC/MS VOA					
Analysis Batch:580-168317					
LCS 580-168317/8	Lab Control Sample	T	Water	8260B	
LCSD 580-168317/9	Lab Control Sample Duplicate	T	Water	8260B	
MB 580-168317/7	Method Blank	T	Water	8260B	
580-45117-1	DUP01-140825-W	T	Water	8260B	
580-45117-4MS	Matrix Spike	T	Water	8260B	
580-45117-4MSD	Matrix Spike Duplicate	T	Water	8260B	
580-45117-5	Trip Blank	T	Water	8260B	
Analysis Batch:580-168393					
LCS 580-168393/8	Lab Control Sample	T	Water	8260B	
LCSD 580-168393/9	Lab Control Sample Duplicate	T	Water	8260B	
MB 580-168393/7	Method Blank	T	Water	8260B	
580-45117-1RA	DUP01-140825-W	T	Water	8260B	
580-45117-2	MW16-140825-W	T	Water	8260B	
580-45117-3	MW03-140825-W	T	Water	8260B	
580-45117-4	MW18-140825-W	T	Water	8260B	

Report Basis
T = Total

General Chemistry

Analysis Batch:580-168473					
LCS 580-168473/4	Lab Control Sample	T	Water	300.0	
LCSD 580-168473/5	Lab Control Sample Duplicate	T	Water	300.0	
MB 580-168473/3	Method Blank	T	Water	300.0	
580-45117-1	DUP01-140825-W	T	Water	300.0	
580-45117-2	MW16-140825-W	T	Water	300.0	
580-45117-3	MW03-140825-W	T	Water	300.0	
580-45117-4	MW18-140825-W	T	Water	300.0	
580-45117-4DU	Duplicate	T	Water	300.0	
580-45117-4MS	Matrix Spike	T	Water	300.0	
580-45117-4MSD	Matrix Spike Duplicate	T	Water	300.0	

Report Basis
T = Total

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
IC-Custom-Std_00003	06/12/15	Environmental Express, Lot 1416009			(Purchased Reagent)		Sulfate	1200 mg/L
TAC044 CCV_00004	03/11/20	Accustandard, Lot 212125095+212115043			(Purchased Reagent)		Sulfate	37.5 mg/L
TAC044 LCS_00003	03/11/20	Environmental Express, Lot 1235623			(Purchased Reagent)		Sulfate	12 mg/L
V-SurTFTWk_00021	09/25/14	09/26/13	fisher MeOH, Lot 123279	200 mL	V-TFTStk_00020	800 uL	Trifluorotoluene (Surr)	39.984 mg/L
.V-TFTStk_00020	09/25/14	09/26/13	methanol, Lot 0000038701	50 mL	TFTneat_00008	420 uL	Trifluorotoluene (Surr)	9996 mg/L
..TFTneat_00008	09/25/14	Sigma-Aldrich, Lot MKBK8533V			(Purchased Reagent)		Trifluorotoluene (Surr)	1190000 mg/L
VOARSURR/IS_00001	02/28/18	Restek, Lot A093508			(Purchased Reagent)		1,2-Dichloroethane-d4 (Surr)	150 ug/mL
							1,4-Dichlorobenzene-d4	250 ug/mL
							4-Bromofluorobenzene (Surr)	150 ug/mL
							Chlorobenzene-d5	250 ug/mL
							Dibromofluoromethane (Surr)	150 ug/mL
							Fluorobenzene (IS)	250 ug/mL
							TBA-d9 (IS)	5000 ug/mL
							Toluene-d8 (Surr)	150 ug/mL
VOARSURR/IS_00008	02/28/18	Restek, Lot A093508			(Purchased Reagent)		1,2-Dichloroethane-d4 (Surr)	150 ug/mL
							4-Bromofluorobenzene (Surr)	150 ug/mL
							Dibromofluoromethane (Surr)	150 ug/mL
							Toluene-d8 (Surr)	150 ug/mL
VOASECGAS2_00006	01/01/15	07/01/14	methanol, Lot 0000049909	50 mL	VOASGAS2__00002	1250 uL	Vinyl chloride	50.0025 ug/mL
.VOASGAS2__00002	02/28/15	Restek, Lot A093618			(Purchased Reagent)		Vinyl chloride	2000.1 ug/mL
VOASECLIQ2_00014	10/31/14	07/22/14	methanol, Lot 0000049909	10 mL	VOASMegMix2__00005	250 uL	1,1-Dichloroethene	50 ug/mL
							cis-1,2-Dichloroethene	50 ug/mL
							Tetrachloroethene	50 ug/mL
							trans-1,2-Dichloroethene	50 ug/mL
							Trichloroethene	50 ug/mL
.VOASMegMix2__00005	02/29/16	Restek, Lot A093733			(Purchased Reagent)		1,1-Dichloroethene	2000 mg/L
							cis-1,2-Dichloroethene	2000 mg/L
							Tetrachloroethene	2000 mg/L
							trans-1,2-Dichloroethene	2000 mg/L
							Trichloroethene	2000 mg/L
VOASTDACROLPT_00018	10/31/14	07/30/14	Methanol, Lot 0000038701	50 mL	VOARAcrolein_00011	750 uL	Acrolein	296.25 ug/mL
.VOARAcrolein_00011	10/31/14	Restek, Lot A0104246			(Purchased Reagent)		Acrolein	19750 ug/mL
VOASTDADDPT_00009	02/28/15	07/02/14	methanol, Lot 0000049909	50 mL	VOARADDCOM__00004	1250 uL	1,3,5-Trichlorobenzene	50 ug/mL
							Tert-amyl methyl ether	50 ug/mL
							Tert-butyl ethyl ether	50 ug/mL
.VOARADDCOM__00004	03/31/15	Restek, Lot A097910			(Purchased Reagent)		1,3,5-Trichlorobenzene	2000 ug/mL
							Tert-amyl methyl ether	2000 ug/mL
							Tert-butyl ethyl ether	2000 ug/mL
VOASTDGASweek_00066	08/28/14	08/21/14	methanol, Lot 124454	1 mL	V-TFTStk_00022	5 uL	Trifluorotoluene (Surr)	49.98 mg/L
					VOARGAS__00002	25 uL	Bromomethane	50.0025 mg/L

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chloroethane	50 mg/L
							Chloromethane	49.995 mg/L
							Dichlorodifluoromethane	50 mg/L
							Trichlorofluoromethane	49.9975 mg/L
							Vinyl chloride	50.0025 mg/L
.V-TFTStk_00022	09/25/14	02/06/14	MeOH, Lot 0000049909	50 mL	TFTneat_00008	420 uL	Trifluorotoluene (Surr)	9996 mg/L
..TFTneat_00008	09/25/14	Sigma-Aldrich, Lot MKBK8533V			(Purchased Reagent)		Trifluorotoluene (Surr)	1190000 mg/L
.VOARGAS__00002	02/28/15	Restek, Lot A093341			(Purchased Reagent)		Bromomethane	2000.1 ug/mL
							Chloroethane	2000 ug/mL
							Chloromethane	1999.8 ug/mL
							Dichlorodifluoromethane	2000 ug/mL
							Trichlorofluoromethane	1999.9 ug/mL
							Vinyl chloride	2000.1 ug/mL
VOASTDGASweek_00067	09/04/14	08/28/14	methanol, Lot 124454	1 mL	V-TFTStk_00022	5 uL	Trifluorotoluene (Surr)	49.98 mg/L
					VOARGAS__00002	25 uL	Vinyl chloride	50.0025 mg/L
.V-TFTStk_00022	09/25/14	02/06/14	MeOH, Lot 0000049909	50 mL	TFTneat_00008	420 uL	Trifluorotoluene (Surr)	9996 mg/L
..TFTneat_00008	09/25/14	Sigma-Aldrich, Lot MKBK8533V			(Purchased Reagent)		Trifluorotoluene (Surr)	1190000 mg/L
.VOARGAS__00002	02/28/15	Restek, Lot A093341			(Purchased Reagent)		Vinyl chloride	2000.1 ug/mL
VOASTDLIQPT_00013	10/31/14	07/23/14	methanol, Lot 0000038701	50 mL	VOAR2CEVE__00004	1250 uL	2-Chloroethyl vinyl ether	50 ug/mL
					VOARKETON__00002	1000 uL	2-Butanone (MEK)	200 ug/mL
							2-Hexanone	200 ug/mL
							4-Methyl-2-pentanone (MIBK)	200 ug/mL
							Acetone	200 ug/mL
					VOARMegMix__00006	1250 uL	1,1,1,2-Tetrachloroethane	50 ug/mL
							1,1,1-Trichloroethane	50 ug/mL
							1,1,2,2-Tetrachloroethane	50 ug/mL
							1,1,2-Trichloro-1,2,2-trifluoroethane	49.9975 ug/mL
							1,1,2-Trichloroethane	50 ug/mL
							1,1-Dichloroethane	50 ug/mL
							1,1-Dichloroethene	50 ug/mL
							1,1-Dichloropropene	50 ug/mL
							1,2,3-Trichlorobenzene	50 ug/mL
							1,2,3-Trichloropropane	50 ug/mL
							1,2,4-Trichlorobenzene	50 ug/mL
							1,2,4-Trimethylbenzene	50 ug/mL
							1,2-Dibromo-3-Chloropropane	50 ug/mL
							1,2-Dichlorobenzene	50 ug/mL
							1,2-Dichloroethane	50 ug/mL
							1,2-Dichloropropane	50 ug/mL
							1,3,5-Trimethylbenzene	50 ug/mL
							1,3-Dichlorobenzene	50 ug/mL
							1,3-Dichloropropane	50 ug/mL
							1,4-Dichlorobenzene	50 ug/mL
							2,2-Dichloropropane	50 ug/mL
							2-Chlorotoluene	50 ug/mL

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2-Methyl-2-propanol	500 ug/mL
							4-Chlorotoluene	50 ug/mL
							4-Isopropyltoluene	50 ug/mL
							Acrylonitrile	500 ug/mL
							Benzene	50 ug/mL
							Bromobenzene	50 ug/mL
							Bromoform	50 ug/mL
							Carbon disulfide	50 ug/mL
							Carbon tetrachloride	50 ug/mL
							Chlorobenzene	50 ug/mL
							Chlorobromomethane	50 ug/mL
							Chlorodibromomethane	50 ug/mL
							Chloroform	50 ug/mL
							cis-1,2-Dichloroethene	50 ug/mL
							cis-1,3-Dichloropropene	50 ug/mL
							Dibromomethane	50 ug/mL
							Dichlorobromomethane	50 ug/mL
							Ethylbenzene	50 ug/mL
							Ethylene Dibromide	50 ug/mL
							Hexachlorobutadiene	50 ug/mL
							Hexane	50 ug/mL
							Iodomethane	50 ug/mL
							Isopropylbenzene	50 ug/mL
							m-Xylene & p-Xylene	50 ug/mL
							Methyl tert-butyl ether	50 ug/mL
							Methylene Chloride	50 ug/mL
							n-Butylbenzene	50 ug/mL
							N-Propylbenzene	50 ug/mL
							Naphthalene	50 ug/mL
							o-Xylene	50 ug/mL
							sec-Butylbenzene	50 ug/mL
							Styrene	50 ug/mL
							tert-Butylbenzene	50 ug/mL
							Tetrachloroethene	50 ug/mL
							Toluene	50 ug/mL
							trans-1,2-Dichloroethene	50 ug/mL
							trans-1,3-Dichloropropene	50 ug/mL
							trans-1,4-Dichloro-2-butene	50 ug/mL
							Trichloroethene	50 ug/mL
					VOARVA__00007	1250 uL	Vinyl acetate	100.183 ug/mL
.VOAR2CEVE__00004	02/29/16		Restek, Lot A093368		(Purchased Reagent)		2-Chloroethyl vinyl ether	2000 ug/mL
.VOARKETON__00002	02/29/16		Restek, Lot A093365		(Purchased Reagent)		2-Butanone (MEK)	10000 ug/mL
							2-Hexanone	10000 ug/mL
							4-Methyl-2-pentanone (MIBK)	10000 ug/mL
							Acetone	10000 ug/mL
.VOARMegMix__00006	02/29/16		Restek, Lot A093781		(Purchased Reagent)		1,1,1,2-Tetrachloroethane	2000 mg/L
							1,1,1-Trichloroethane	2000 mg/L
							1,1,2,2-Tetrachloroethane	2000 mg/L

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,1,2-Trichloro-1,2,2-trifluoroethane	1999.9 mg/L
							1,1,2-Trichloroethane	2000 mg/L
							1,1-Dichloroethane	2000 mg/L
							1,1-Dichloroethene	2000 mg/L
							1,1-Dichloropropene	2000 mg/L
							1,2,3-Trichlorobenzene	2000 mg/L
							1,2,3-Trichloropropane	2000 mg/L
							1,2,4-Trichlorobenzene	2000 mg/L
							1,2,4-Trimethylbenzene	2000 mg/L
							1,2-Dibromo-3-Chloropropane	2000 mg/L
							1,2-Dichlorobenzene	2000 mg/L
							1,2-Dichloroethane	2000 mg/L
							1,2-Dichloropropane	2000 mg/L
							1,3,5-Trimethylbenzene	2000 mg/L
							1,3-Dichlorobenzene	2000 mg/L
							1,3-Dichloropropane	2000 mg/L
							1,4-Dichlorobenzene	2000 mg/L
							2,2-Dichloropropane	2000 mg/L
							2-Chlorotoluene	2000 mg/L
							2-Methyl-2-propanol	20000 mg/L
							4-Chlorotoluene	2000 mg/L
							4-Isopropyltoluene	2000 mg/L
							Acrylonitrile	20000 mg/L
							Benzene	2000 mg/L
							Bromobenzene	2000 mg/L
							Bromoform	2000 mg/L
							Carbon disulfide	2000 mg/L
							Carbon tetrachloride	2000 mg/L
							Chlorobenzene	2000 mg/L
							Chlorobromomethane	2000 mg/L
							Chlorodibromomethane	2000 mg/L
							Chloroform	2000 mg/L
							cis-1,2-Dichloroethene	2000 mg/L
							cis-1,3-Dichloropropene	2000 mg/L
							Dibromomethane	2000 mg/L
							Dichlorobromomethane	2000 mg/L
							Ethylbenzene	2000 mg/L
							Ethylene Dibromide	2000 mg/L
							Hexachlorobutadiene	2000 mg/L
							Hexane	2000 mg/L
							Iodomethane	2000 mg/L
							Isopropylbenzene	2000 mg/L
							m-Xylene & p-Xylene	2000 mg/L
							Methyl tert-butyl ether	2000 mg/L
							Methylene Chloride	2000 mg/L
							n-Butylbenzene	2000 mg/L
							N-Propylbenzene	2000 mg/L

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Naphthalene	2000 mg/L
							o-Xylene	2000 mg/L
							sec-Butylbenzene	2000 mg/L
							Styrene	2000 mg/L
							tert-Butylbenzene	2000 mg/L
							Tetrachloroethene	2000 mg/L
							Toluene	2000 mg/L
							trans-1,2-Dichloroethene	2000 mg/L
							trans-1,3-Dichloropropene	2000 mg/L
							trans-1,4-Dichloro-2-butene	2000 mg/L
							Trichloroethene	2000 mg/L
.VOARVA__00007	10/31/14	Restek, Lot A0102473			(Purchased Reagent)		Vinyl acetate	4007.3 ug/mL

Certification Summary

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)

TestAmerica Job ID: 580-45117-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Seattle	Alaska (UST)	State Program	10	UST-022
TestAmerica Seattle	Alaska (UST)	State Program	10	UST-112
TestAmerica Seattle	Alaska (UST)	State Program	10	UST-113
TestAmerica Seattle	California	State Program	9	2901
TestAmerica Seattle	L-A-B	DoD ELAP		L2236
TestAmerica Seattle	L-A-B	ISO/IEC 17025		L2236
TestAmerica Seattle	Montana (UST)	State Program	8	N/A
TestAmerica Seattle	Oregon	NELAP	10	WA100007
TestAmerica Seattle	USDA	Federal		P330-11-00222
TestAmerica Seattle	Washington	State Program	10	C553

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

Method 8260B Low Level

Volatile Organic Compounds (GC/MS) by Method 8260B Low Level

FORM II
GC/MS VOA SURROGATE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): ZB-624short ID: 0.18 (mm)

Client Sample ID	Lab Sample ID	DBFM #	DCA #	TFT #	TOL #	BFB #
DUP01-140825-W	580-45117-1	96	99	88	102	97
DUP01-140825-W RA	580-45117-1 RA	96	100	93	100	96
MW16-140825-W	580-45117-2	99	102	93	101	96
MW03-140825-W	580-45117-3	96	103	90	100	97
MW18-140825-W	580-45117-4	95	102	92	100	99
Trip Blank	580-45117-5	96	98	89	102	98
	MB 580-168317/7	98	99	86	100	97
	MB 580-168393/7	99	100	80	101	98
	LCS 580-168317/8	100	98	91	103	104
	LCS 580-168393/8	104	100	101	103	102
	LCSD 580-168317/9	102	96	96	102	102
	LCSD 580-168393/9	103	98	100	100	104
MW18-140825-W MS	580-45117-4 MS	98	96	102	103	105
MW18-140825-W MSD	580-45117-4 MSD	98	98	99	102	99

	QC LIMITS
DBFM = Dibromofluoromethane (Surr)	85-115
DCA = 1,2-Dichloroethane-d4 (Surr)	70-128
TFT = Trifluorotoluene (Surr)	80-127
TOL = Toluene-d8 (Surr)	75-125
BFB = 4-Bromofluorobenzene (Surr)	75-120

Column to be used to flag recovery values

FORM II 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Matrix: Water Level: Low Lab File ID: I0344191.D

Lab ID: LCS 580-168317/8 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
cis-1,2-Dichloroethene	5.00	5.17	103	80-130	
1,1-Dichloroethene	5.00	5.19	104	70-150	
Tetrachloroethene	5.00	5.07	101	40-180	
trans-1,2-Dichloroethene	5.00	5.40	108	80-140	
Trichloroethene	5.00	5.21	104	80-130	
Vinyl chloride	5.00	5.31	106	65-140	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Matrix: Water Level: Low Lab File ID: I0344221.D

Lab ID: LCS 580-168393/8 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
cis-1,2-Dichloroethene	5.00	5.59	112	80-130	
1,1-Dichloroethene	5.00	5.55	111	70-150	
Tetrachloroethene	5.00	3.92	78	40-180	
trans-1,2-Dichloroethene	5.00	5.65	113	80-140	
Trichloroethene	5.00	5.37	107	80-130	
Vinyl chloride	5.00	5.76	115	65-140	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Matrix: Water Level: Low Lab File ID: I0344192.D

Lab ID: LCSD 580-168317/9 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
cis-1,2-Dichloroethene	5.00	5.37	107	4	20	80-130	
1,1-Dichloroethene	5.00	5.21	104	0	20	70-150	
Tetrachloroethene	5.00	5.28	106	4	20	40-180	
trans-1,2-Dichloroethene	5.00	5.45	109	1	20	80-140	
Trichloroethene	5.00	5.27	105	1	20	80-130	
Vinyl chloride	5.00	5.51	110	4	20	65-140	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Matrix: Water Level: Low Lab File ID: I0344222.D

Lab ID: LCSD 580-168393/9 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
cis-1,2-Dichloroethene	5.00	5.69	114	2	20	80-130	
1,1-Dichloroethene	5.00	5.57	111	0	20	70-150	
Tetrachloroethene	5.00	4.32	86	10	20	40-180	
trans-1,2-Dichloroethene	5.00	5.50	110	3	20	80-140	
Trichloroethene	5.00	5.24	105	2	20	80-130	
Vinyl chloride	5.00	5.56	111	4	20	65-140	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Matrix: Water Level: Low Lab File ID: I0344193.D

Lab ID: 580-45117-4 MS Client ID: MW18-140825-W MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
cis-1,2-Dichloroethene	5.00	0.51	5.71	104	71-144	
1,1-Dichloroethene	5.00	ND	5.08	102	78-151	
Tetrachloroethene	5.00	ND	3.30	66	64-161	
trans-1,2-Dichloroethene	5.00	0.43	5.67	105	73-135	
Trichloroethene	5.00	0.48	5.76	106	79-131	
Vinyl chloride	5.00	2.7	8.18	110	47-160	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Matrix: Water Level: Low Lab File ID: I0344194.D

Lab ID: 580-45117-4 MSD Client ID: MW18-140825-W MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
cis-1,2-Dichloroethene	5.00	5.52	100	3	20	71-144	
1,1-Dichloroethene	5.00	5.15	103	1	30	78-151	
Tetrachloroethene	5.00	3.23	65	2	20	64-161	
trans-1,2-Dichloroethene	5.00	5.65	104	0	20	73-135	
Trichloroethene	5.00	5.57	102	3	30	79-131	
Vinyl chloride	5.00	7.91	105	3	20	47-160	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab File ID: I0344190.D Lab Sample ID: MB 580-168317/7

Matrix: Water Heated Purge:(Y/N) N

Instrument ID: SEA015 Date Analyzed: 08/28/2014 12:48

GC Column: ZB-624short ID: 0.18(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 580-168317/8	I0344191.D	08/28/2014 13:12
	LCSD 580-168317/9	I0344192.D	08/28/2014 13:36
MW18-140825-W MS	580-45117-4 MS	I0344193.D	08/28/2014 14:01
MW18-140825-W MSD	580-45117-4 MSD	I0344194.D	08/28/2014 14:25
Trip Blank	580-45117-5	I0344197.D	08/28/2014 15:39
DUP01-140825-W	580-45117-1	I0344210.D	08/28/2014 20:58

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab File ID: I0344220.D Lab Sample ID: MB 580-168393/7

Matrix: Water Heated Purge:(Y/N) N

Instrument ID: SEA015 Date Analyzed: 08/29/2014 09:28

GC Column: ZB-624short ID: 0.18(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 580-168393/8	I0344221.D	08/29/2014 09:52
	LCSD 580-168393/9	I0344222.D	08/29/2014 10:16
DUP01-140825-W RA	580-45117-1 RA	I0344225.D	08/29/2014 11:41
MW16-140825-W	580-45117-2	I0344226.D	08/29/2014 12:05
MW03-140825-W	580-45117-3	I0344227.D	08/29/2014 12:29
MW18-140825-W	580-45117-4	I0344228.D	08/29/2014 13:00

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab File ID: I0344142.D BFB Injection Date: 08/26/2014

Instrument ID: SEA015 BFB Injection Time: 15:54

Analysis Batch No.: 168147

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	18.0	
75	30.0 - 60.0 % of mass 95	46.1	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.9	
173	Less than 2.0 % of mass 174	0.6	(0.6)1
174	50.0 - 120.00 % of mass 95	97.1	
175	5.0 - 9.0 % of mass 174	6.9	(7.1)1
176	95.0 - 101.0 % of mass 174	93.0	(95.8)1
177	5.0 - 9.0 % of mass 176	6.1	(6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	STD00002 580-168147/3	I0344143.D	08/26/2014	16:18
	STD0001 580-168147/4	I0344144.D	08/26/2014	16:43
	STD0002 580-168147/5	I0344145.D	08/26/2014	17:08
	STD0004 580-168147/6	I0344146.D	08/26/2014	17:32
	STD001 580-168147/7	I0344147.D	08/26/2014	17:57
	STD005 580-168147/8	I0344148.D	08/26/2014	18:22
	ICIS 580-168147/9	I0344149.D	08/26/2014	18:46
	STD025 580-168147/10	I0344150.D	08/26/2014	19:11
	STD050 580-168147/11	I0344151.D	08/26/2014	19:36
	STD080 580-168147/12	I0344152.D	08/26/2014	20:00
	ICV 580-168147/14	I0344154.D	08/26/2014	20:48

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab File ID: I0344185.D BFB Injection Date: 08/28/2014

Instrument ID: SEA015 BFB Injection Time: 10:46

Analysis Batch No.: 168317

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	18.2	
75	30.0 - 60.0 % of mass 95	46.9	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.7	
173	Less than 2.0 % of mass 174	0.3	(0.4)1
174	50.0 - 120.00 % of mass 95	91.5	
175	5.0 - 9.0 % of mass 174	6.3	(6.9)1
176	95.0 - 101.0 % of mass 174	89.1	(97.4)1
177	5.0 - 9.0 % of mass 176	5.8	(6.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 580-168317/3	I0344186.D	08/28/2014	11:10
	MB 580-168317/7	I0344190.D	08/28/2014	12:48
	LCS 580-168317/8	I0344191.D	08/28/2014	13:12
	LCSD 580-168317/9	I0344192.D	08/28/2014	13:36
MW18-140825-W MS	580-45117-4 MS	I0344193.D	08/28/2014	14:01
MW18-140825-W MSD	580-45117-4 MSD	I0344194.D	08/28/2014	14:25
Trip Blank	580-45117-5	I0344197.D	08/28/2014	15:39
DUP01-140825-W	580-45117-1	I0344210.D	08/28/2014	20:58

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab File ID: I0344217bfb.D BFB Injection Date: 08/29/2014

Instrument ID: SEA015 BFB Injection Time: 07:37

Analysis Batch No.: 168393

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	18.0	
75	30.0 - 60.0 % of mass 95	46.8	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.9	
173	Less than 2.0 % of mass 174	0.6	(0.6)1
174	50.0 - 120.00 % of mass 95	91.8	
175	5.0 - 9.0 % of mass 174	6.4	(7.0)1
176	95.0 - 101.0 % of mass 174	88.3	(96.2)1
177	5.0 - 9.0 % of mass 176	5.7	(6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 580-168393/3	I0344217.D	08/29/2014	07:37
	MB 580-168393/7	I0344220.D	08/29/2014	09:28
	LCS 580-168393/8	I0344221.D	08/29/2014	09:52
	LCSD 580-168393/9	I0344222.D	08/29/2014	10:16
DUP01-140825-W RA	580-45117-1 RA	I0344225.D	08/29/2014	11:41
MW16-140825-W	580-45117-2	I0344226.D	08/29/2014	12:05
MW03-140825-W	580-45117-3	I0344227.D	08/29/2014	12:29
MW18-140825-W	580-45117-4	I0344228.D	08/29/2014	13:00

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Sample No.: ICIS 580-168147/9 Date Analyzed: 08/26/2014 18:46

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm)

Lab File ID (Standard): I0344149.D Heated Purge: (Y/N) N

Calibration ID: 17850

		TBA		FB		CBZ	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		653009	1.77	2140410	2.69	1641631	3.87
UPPER LIMIT		1306018	2.27		3.19	3283262	4.37
LOWER LIMIT		326505	1.27		2.19	820816	3.37
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 580-168147/14		670873	1.76	2261185	2.69	1692282	3.88

TBA = TBA-d9 (IS)
FB = Fluorobenzene (IS)
CBZ = Chlorobenzene-d5

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Sample No.: ICIS 580-168147/9 Date Analyzed: 08/26/2014 18:46

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm)

Lab File ID (Standard): I0344149.D Heated Purge: (Y/N) N

Calibration ID: 17850

		DCB					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		936617	4.90				
UPPER LIMIT		1873234	5.40				
LOWER LIMIT		468309	4.40				
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 580-168147/14		993944	4.89				

DCB = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Sample No.: CCVIS 580-168317/3 Date Analyzed: 08/28/2014 11:10

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm)

Lab File ID (Standard): I0344186.D Heated Purge: (Y/N) N

Calibration ID: 17850

		TBA		FB		CBZ	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD				2285799	2.69	1758168	3.88
UPPER LIMIT					3.19	3516336	4.38
LOWER LIMIT					2.19	879084	3.38
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 580-168317/7				2117798	2.69	1566870	3.88
LCS 580-168317/8				2094670	2.69	1540519	3.88
LCSD 580-168317/9				2073319	2.69	1493518	3.87
580-45117-4 MS	MW18-140825-W MS			2215249	2.69	1681467	3.88
580-45117-4 MSD	MW18-140825-W MSD	632714	1.76	2262569	2.69	1758995	3.88
580-45117-5	Trip Blank			2161837	2.69	1635566	3.88
580-45117-1	DUP01-140825-W			2038335	2.69	1560612	3.88

TBA = TBA-d9 (IS)
FB = Fluorobenzene (IS)
CBZ = Chlorobenzene-d5

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Sample No.: CCVIS 580-168317/3 Date Analyzed: 08/28/2014 11:10

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm)

Lab File ID (Standard): I0344186.D Heated Purge: (Y/N) N

Calibration ID: 17850

		DCB					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1019473	4.89				
UPPER LIMIT		2038946	5.39				
LOWER LIMIT		509737	4.39				
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 580-168317/7		892655	4.89				
LCS 580-168317/8		943858	4.89				
LCSD 580-168317/9		907524	4.89				
580-45117-4 MS	MW18-140825-W MS	956559	4.89				
580-45117-4 MSD	MW18-140825-W MSD	987106	4.89				
580-45117-5	Trip Blank	910890	4.89				
580-45117-1	DUP01-140825-W	864554	4.89				

DCB = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Sample No.: CCVIS 580-168393/3 Date Analyzed: 08/29/2014 07:37

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm)

Lab File ID (Standard): I0344217.D Heated Purge: (Y/N) N

Calibration ID: 17850

		FB		CBZ		DCB	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		2052919	2.69	1558407	3.87	897906	4.90
UPPER LIMIT			3.19	3116814	4.37	1795812	5.40
LOWER LIMIT			2.19	779204	3.37	448953	4.40
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 580-168393/7		1976076	2.69	1416144	3.88	853132	4.89
LCS 580-168393/8		1920718	2.69	1418208	3.88	857726	4.89
LCSD 580-168393/9		1971283	2.70	1432470	3.87	864514	4.90
580-45117-1 RA	DUP01-140825-W RA	2035970	2.69	1561335	3.88	853339	4.89
580-45117-2	MW16-140825-W	1991770	2.69	1512830	3.88	836453	4.89
580-45117-3	MW03-140825-W	1946947	2.69	1496931	3.88	820830	4.89
580-45117-4	MW18-140825-W	1986681	2.69	1525583	3.87	833925	4.90

FB = Fluorobenzene (IS)
CBZ = Chlorobenzene-d5
DCB = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: DUP01-140825-W | Lab Sample ID: 580-45117-1

Matrix: Water | Lab File ID: I0344210.D

Analysis Method: 8260B | Date Collected: 08/25/2014 12:00

Sample wt/vol: 10(mL) | Date Analyzed: 08/28/2014 20:58

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168317 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	0.19		0.10	0.10
75-01-4	Vinyl chloride	0.51		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	97		75-120
98-08-8	Trifluorotoluene (Surr)	88		80-127
2037-26-5	Toluene-d8 (Surr)	102		75-125
1868-53-7	Dibromofluoromethane (Surr)	96		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		70-128

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: DUP01-140825-W RA | Lab Sample ID: 580-45117-1 RA

Matrix: Water | Lab File ID: I0344225.D

Analysis Method: 8260B | Date Collected: 08/25/2014 12:00

Sample wt/vol: 10(mL) | Date Analyzed: 08/29/2014 11:41

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168393 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	0.25		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
79-01-6	Trichloroethene	0.36		0.10	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	96		75-120
98-08-8	Trifluorotoluene (Surr)	93		80-127
2037-26-5	Toluene-d8 (Surr)	100		75-125
1868-53-7	Dibromofluoromethane (Surr)	96		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		70-128

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: MW16-140825-W | Lab Sample ID: 580-45117-2

Matrix: Water | Lab File ID: I0344226.D

Analysis Method: 8260B | Date Collected: 08/25/2014 13:25

Sample wt/vol: 10(mL) | Date Analyzed: 08/29/2014 12:05

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168393 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	0.25		0.10	0.10
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	0.18		0.10	0.10
79-01-6	Trichloroethene	0.37		0.10	0.10
75-01-4	Vinyl chloride	0.52		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	96		75-120
98-08-8	Trifluorotoluene (Surr)	93		80-127
2037-26-5	Toluene-d8 (Surr)	101		75-125
1868-53-7	Dibromofluoromethane (Surr)	99		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		70-128

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: MW03-140825-W | Lab Sample ID: 580-45117-3

Matrix: Water | Lab File ID: I0344227.D

Analysis Method: 8260B | Date Collected: 08/25/2014 14:40

Sample wt/vol: 10(mL) | Date Analyzed: 08/29/2014 12:29

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168393 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	0.35		0.10	0.10
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	0.36		0.10	0.10
79-01-6	Trichloroethene	ND		0.10	0.10
75-01-4	Vinyl chloride	0.25		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	97		75-120
98-08-8	Trifluorotoluene (Surr)	90		80-127
2037-26-5	Toluene-d8 (Surr)	100		75-125
1868-53-7	Dibromofluoromethane (Surr)	96		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		70-128

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: MW18-140825-W | Lab Sample ID: 580-45117-4

Matrix: Water | Lab File ID: I0344228.D

Analysis Method: 8260B | Date Collected: 08/25/2014 15:50

Sample wt/vol: 10(mL) | Date Analyzed: 08/29/2014 13:00

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168393 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	0.51		0.10	0.10
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	0.43		0.10	0.10
79-01-6	Trichloroethene	0.48		0.10	0.10
75-01-4	Vinyl chloride	2.7		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	99		75-120
98-08-8	Trifluorotoluene (Surr)	92		80-127
2037-26-5	Toluene-d8 (Surr)	100		75-125
1868-53-7	Dibromofluoromethane (Surr)	95		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		70-128

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: Trip Blank | Lab Sample ID: 580-45117-5

Matrix: Water | Lab File ID: I0344197.D

Analysis Method: 8260B | Date Collected: 08/25/2014 00:00

Sample wt/vol: 10(mL) | Date Analyzed: 08/28/2014 15:39

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168317 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	ND		0.10	0.10
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	ND		0.10	0.10
79-01-6	Trichloroethene	ND		0.10	0.10
75-01-4	Vinyl chloride	ND		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	98		75-120
98-08-8	Trifluorotoluene (Surr)	89		80-127
2037-26-5	Toluene-d8 (Surr)	102		75-125
1868-53-7	Dibromofluoromethane (Surr)	96		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		70-128

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Seattle Job No.: 580-45117-1 Analy Batch No.: 168147

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/26/2014 16:18 Calibration End Date: 08/26/2014 20:00 Calibration ID: 17850

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD00002 580-168147/3	I0344143.D
Level 2	STD0001 580-168147/4	I0344144.D
Level 3	STD0002 580-168147/5	I0344145.D
Level 4	STD0004 580-168147/6	I0344146.D
Level 5	STD001 580-168147/7	I0344147.D
Level 6	STD005 580-168147/8	I0344148.D
Level 7	ICIS 580-168147/9	I0344149.D
Level 8	STD025 580-168147/10	I0344150.D
Level 9	STD050 580-168147/11	I0344151.D
Level 10	STD080 580-168147/12	I0344152.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
Dichlorodifluoromethane	+++++ 0.4477	0.4219 0.4291	0.4202 0.4461	0.4404 0.4468	0.4714 0.4293	Ave		0.4392				3.7		15.0			
Chloromethane	+++++ 0.3227	0.5036 0.3177	0.3363 0.3238	0.3952 0.3079	0.3153 0.3093	Lin2	0.0170	0.3124			0.1000				0.9900		0.9900
Vinyl chloride	0.4080 0.3234	0.4266 0.3086	0.3245 0.3243	0.3162 0.3179	0.3210 0.3112	Ave		0.3382				13.0		15.0			
Bromomethane	+++++ 0.2320	0.4458 0.2108	0.3155 0.1868	0.2689 +++++	0.2292 +++++	Lin2	0.0236	0.2063							0.9950		0.9900
Chloroethane	+++++ 0.0496	+++++ 0.0481	0.0599 0.0449	0.0668 0.0369	0.0634 +++++	Qua1	0.0040	0.0516	0						0.9990		0.9900
Trichlorofluoromethane	+++++ 0.4406	0.4726 0.4324	0.4201 0.4617	0.4017 0.4444	0.4811 0.4122	Ave		0.4407				6.2		15.0			
Acrolein	+++++ 0.0121	0.0237 0.0113	0.0261 0.0116	0.0148 0.0114	0.0153 0.0113	Lin1	0.0112	0.0113							0.9990		0.9900
1,1,2-Trichloro-1,2,2-trifluoroethane	0.3255 0.2823	0.3367 0.2716	0.2715 0.2804	0.2434 0.2687	0.2782 0.2548	Ave		0.2813				10.0		15.0			
1,1-Dichloroethene	+++++ 0.2875	0.3398 0.2806	0.3112 0.2795	0.2821 0.2753	0.3052 0.2643	Ave		0.2917				7.9		15.0			
Acetone	+++++ 0.0440	0.2664 0.0405	0.1765 0.0388	0.1015 0.0362	0.0678 0.0340	Lin1	0.1034	0.0353							0.9970		0.9900
Iodomethane	+++++ 0.6375	0.7709 0.6172	0.5812 0.6202	0.6081 0.6014	0.6218 0.5790	Ave		0.6264				9.2		15.0			
Carbon disulfide	+++++ 0.7596	0.8572 0.7605	0.7210 0.7722	0.6508 0.7825	0.7521 0.7482	Ave		0.7560				7.2		15.0			
Methylene Chloride	3.0609 0.2956	0.8580 0.2803	0.5223 0.2674	0.4114 0.2608	0.3323 0.2445	Lin2	0.0559	0.2681							0.9960		0.9900

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Seattle Job No.: 580-45117-1 Analy Batch No.: 168147

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/26/2014 16:18 Calibration End Date: 08/26/2014 20:00 Calibration ID: 17850

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
2-Methyl-2-propanol	+++++ 0.0140	0.0204 0.0149	0.0191 0.0151	0.0150 0.0139	0.0158 0.0149	Ave		0.0159				14.0		15.0			
Methyl tert-butyl ether	+++++ 0.5671	0.5468 0.5589	0.5423 0.5490	0.5229 0.5330	0.5814 0.5098	Ave		0.5457				4.0		15.0			
trans-1,2-Dichloroethene	+++++ 0.2961	0.3610 0.2874	0.3015 0.2890	0.3179 0.2826	0.2877 0.2668	Ave		0.2989				9.1		15.0			
Acrylonitrile	+++++ 0.0475	0.0630 0.0466	0.0501 0.0460	0.0515 0.0439	0.0483 0.0415	Ave		0.0487				13.0		15.0			
n-Hexane	+++++ 0.2840	0.4416 0.2779	0.3356 0.2655	0.2762 0.2669	0.2978 0.2515	Lin2	0.0165	0.2651							0.9950		0.9900
1,1-Dichloroethane	+++++ 0.4765	0.5706 0.4654	0.4848 0.4571	0.4664 0.4440	0.4719 0.4207	Ave		0.4730			0.1000	8.7		15.0			
Vinyl acetate	+++++ 0.0152	0.0145 0.0159	0.0254 0.0160	0.0140 0.0153	0.0170 0.0132	Lin1	0.0018	0.0144							0.9920		0.9900
Tert-butyl ethyl ether	0.3050 0.2816	0.3067 0.2717	0.2936 0.2803	0.2572 0.2667	0.2851 0.2583	Ave		0.2806				6.3		15.0			
2,2-Dichloropropane	+++++ 0.2221	0.3103 0.2047	0.2518 0.2059	0.2341 0.1971	0.2343 0.1855	Lin2	0.0105	0.2053							0.9960		0.9900
cis-1,2-Dichloroethene	+++++ 0.3295	0.3562 0.3230	0.3143 0.3257	0.3237 0.3232	0.3293 0.3217	Ave		0.3274				3.6		15.0			
2-Butanone	+++++ 0.0067	0.0096 0.0063	0.0084 0.0065	0.0077 0.0061	0.0082 0.0060	Lin2	0.0013	0.0066							0.9910		0.9900
Chlorobromomethane	+++++ 0.1986	0.1799 0.2028	0.2071 0.2039	0.1759 0.2048	0.2018 0.2039	Ave		0.1976				5.8		15.0			
Chloroform	+++++ 0.5772	0.5342 0.5602	0.5376 0.5667	0.5364 0.5639	0.5825 0.5454	Ave		0.5560				3.3		15.0			
1,1,1-Trichloroethane	+++++ 0.4347	0.4756 0.4343	0.3575 0.4475	0.3699 0.4492	0.4163 0.4319	Ave		0.4241				9.0		15.0			
1,1-Dichloropropene	+++++ 0.3875	0.4066 0.3864	0.3476 0.3895	0.3563 0.3883	0.3683 0.3811	Ave		0.3791				4.9		15.0			
Carbon tetrachloride	+++++ 0.3992	0.4077 0.4228	0.3751 0.4506	0.3330 0.4514	0.3791 0.4404	Ave		0.4066				9.8		15.0			
Benzene	+++++ 1.1552	1.3049 1.1313	1.0868 1.1508	1.1223 1.1410	1.1436 1.0990	Ave		1.1483				5.5		15.0			
1,2-Dichloroethane	+++++ 0.3478	0.4333 0.3665	0.3506 0.3634	0.3395 0.3394	0.3485 0.3364	Ave		0.3584				8.4		15.0			
Tert-amyl methyl ether	+++++ 0.5931	0.5736 0.6175	0.5449 0.6317	0.5262 0.6336	0.6090 0.6160	Ave		0.5940				6.4		15.0			
Trichloroethene	0.3424 0.3290	0.3512 0.3306	0.3001 0.3325	0.2841 0.3453	0.3182 0.3471	Ave		0.3281				6.6		15.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Seattle Job No.: 580-45117-1 Analy Batch No.: 168147

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/26/2014 16:18 Calibration End Date: 08/26/2014 20:00 Calibration ID: 17850

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
1,2-Dichloropropane	+++++ 0.2861	0.2747 0.2911	0.2749 0.2886	0.2911 0.2840	0.2792 0.2742	Ave		0.2827				2.5		15.0			
Dibromomethane	+++++ 0.1723	0.1726 0.1806	0.1726 0.1806	0.1567 0.1792	0.1572 0.1783	Ave		0.1722				5.4		15.0			
Dichlorobromomethane	0.4162 0.3667	0.3140 0.3848	0.3267 0.4092	0.2921 0.4152	0.3446 0.4093	Ave		0.3679				13.0		15.0			
2-Chloroethyl vinyl ether	+++++ 0.1449	+++++ 0.1533	0.1285 0.1609	0.1113 0.1574	0.1146 0.1538	Ave		0.1406				14.0		15.0			
cis-1,3-Dichloropropene	+++++ 0.5002	0.4639 0.5278	0.3744 0.5478	0.3544 0.5396	0.4136 0.5206	Lin1	-0.028	0.5302							0.9990		0.9900
4-Methyl-2-pentanone	0.0595 0.0814	0.0607 0.0822	0.0547 0.0831	0.0567 0.0807	0.0677 0.0772	Lin1	-0.005	0.0794							0.9990		0.9900
Toluene	+++++ 1.5572	1.4139 1.5432	1.4301 1.5368	1.4681 1.5478	1.5239 1.3820	Ave		1.4892				4.5		15.0			
trans-1,3-Dichloropropene	+++++ 0.3636	0.3256 0.3907	0.2904 0.4122	0.2796 0.4239	0.3184 0.4171	Lin1	-0.028	0.4156							0.9990		0.9900
1,1,2-Trichloroethane	+++++ 0.2768	0.2348 0.2701	0.2762 0.2704	0.2444 0.2632	0.2647 0.2508	Ave		0.2613				5.6		15.0			
Tetrachloroethene	0.5055 0.5944	0.5896 0.5862	0.5307 0.6035	0.4647 0.6304	0.5564 0.6485	Ave		0.5710				10.0		15.0			
1,3-Dichloropropane	+++++ 0.4356	0.4014 0.4493	0.3883 0.4399	0.3781 0.4322	0.4153 0.4122	Ave		0.4169				5.8		15.0			
2-Hexanone	+++++ 0.0715	0.0535 0.0784	0.0563 0.0776	0.0529 0.0756	0.0611 0.0718	Lin1	-0.015	0.0742							0.9990		0.9900
Chlorodibromomethane	+++++ 0.3229	0.2907 0.3382	0.2441 0.3604	0.2442 0.3756	0.2915 0.3673	Lin1	-0.024	0.3661							0.9990		0.9900
1,2-Dibromoethane	+++++ 0.2835	0.2337 0.2840	0.2116 0.2875	0.2382 0.2799	0.2506 0.2671	Ave		0.2596				10.0		15.0			
Chlorobenzene	+++++ 1.0595	1.0384 1.0616	1.0395 1.0639	0.9719 1.0789	1.0708 1.0135	Ave		1.0442			0.3000	3.2		15.0			
1,1,1,2-Tetrachloroethane	+++++ 0.3703	0.2983 0.3755	0.2936 0.3919	0.2773 0.4015	0.3459 0.3915	Ave		0.3495				14.0		15.0			
Ethylbenzene	1.6094 1.3258	1.8202 1.7082	1.3937 1.7601	1.4624 1.7545	1.6058 +++++	Ave		1.6045				11.0		15.0			
m-Xylene & p-Xylene	1.2747 1.3258	1.1482 1.3390	1.0882 1.3735	1.0209 1.3619	1.1868 1.1568	Ave		1.2276				10.0		15.0			
o-Xylene	1.1409 1.3420	0.9854 1.3548	0.9271 1.4155	0.9637 1.4100	1.1223 1.1725	Lin1	-0.016	1.2923							0.9920		0.9900
Styrene	0.9508 1.0884	0.7071 1.1010	0.7495 1.1232	0.7127 1.1626	0.9169 1.0510	Lin1	-0.020	1.0970							0.9980		0.9900

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Seattle Job No.: 580-45117-1 Analy Batch No.: 168147

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/26/2014 16:18 Calibration End Date: 08/26/2014 20:00 Calibration ID: 17850

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
Bromoform	+++++ 0.1725	0.1547 0.1866	0.1232 0.2046	0.1403 0.2133	0.1442 0.2174	Lin1	-0.018	0.2114			0.1000				0.9970		0.9900
Isopropylbenzene	1.4679 1.6441	1.2606 1.6760	1.0891 1.7292	1.0619 1.7096	1.3757 1.5004	Lin1	-0.023	1.6080							0.9950		0.9900
1,1,2,2-Tetrachloroethane	+++++ 0.5463	0.7319 0.5346	0.5036 0.5456	0.4944 0.5341	0.5498 0.5020	Ave		0.5491			0.3000	13.0		15.0			
Bromobenzene	0.8567 0.8310	0.9249 0.8468	0.7064 0.8850	0.7992 0.9034	0.7825 0.9158	Ave		0.8452				8.1		15.0			
trans-1,4-Dichloro-2-butene	+++++ 0.1384	+++++ 0.1405	0.1577 0.1489	0.0923 0.1440	0.1251 0.1341	Ave		0.1351				15.0		15.0			
1,2,3-Trichloropropane	+++++ 0.1492	0.1879 0.1572	0.1110 0.1565	0.1193 0.1550	0.1554 0.1490	Ave		0.1489				15.0		15.0			
N-Propylbenzene	3.4577 3.4330	2.9061 3.4924	2.6810 3.6278	2.7661 3.3823	3.1357 2.4310	Ave		3.1313				13.0		15.0			
2-Chlorotoluene	0.6994 0.7423	0.6034 0.7389	0.7001 0.7561	0.5305 0.7904	0.6593 0.7876	Ave		0.7008				12.0		15.0			
1,3,5-Trimethylbenzene	1.9522 2.4578	1.7946 2.4602	1.7445 2.5175	1.6941 2.5970	1.9706 2.2765	Lin1	-0.040	2.4191							0.9960		0.9900
4-Chlorotoluene	0.6067 0.7876	0.6701 0.7589	0.6075 0.7805	0.6154 0.8126	0.6853 0.8083	Ave		0.7133				12.0		15.0			
tert-Butylbenzene	+++++ 1.9957	1.5583 2.0290	1.3398 2.1539	1.3762 2.3432	1.6434 2.5088	Lin1	-0.231	2.3685							0.9950		0.9900
1,2,4-Trimethylbenzene	+++++ 2.5547	1.7815 2.5455	1.3997 2.6307	1.5689 2.6811	2.0408 2.5074	Lin1	-0.187	2.5828							0.9990		0.9900
sec-Butylbenzene	2.6319 2.9795	1.9780 2.9572	1.8638 3.1558	2.0333 3.1630	2.3940 2.8296	Lin1	-0.056	2.9832							0.9970		0.9900
4-Isopropyltoluene	1.8988 2.5384	1.3313 2.5955	1.4870 2.7297	1.4621 2.8308	1.9509 2.5262	Lin1	-0.074	2.6454							0.9960		0.9900
1,3-Dichlorobenzene	1.8272 1.6228	1.4276 1.5671	1.3606 1.6264	1.4320 1.6397	1.5138 1.6496	Ave		1.5667				8.8		15.0			
1,4-Dichlorobenzene	2.1418 1.6384	1.9364 1.5946	1.4991 1.6506	1.4559 1.6919	1.6015 1.6805	Ave		1.6891				12.0		15.0			
n-Butylbenzene	0.4859 0.5728	0.4559 0.5749	0.3384 0.6215	0.4025 0.6348	0.4148 0.6290	Lin1	-0.016	0.6235							0.9980		0.9900
1,2-Dichlorobenzene	+++++ 1.4420	1.4455 1.4344	1.1212 1.4746	1.3065 1.4820	1.3710 1.4590	Ave		1.3929				8.3		15.0			
1,2-Dibromo-3-Chloropropane	+++++ 0.0863	0.0527 0.0856	0.1348 0.0987	0.0642 0.1046	0.0678 0.1031	Lin1	-0.006	0.1014							0.9970		0.9900
1,3,5-Trichlorobenzene	+++++ 1.0441	1.0323 1.0624	1.0223 1.1418	0.9436 1.2012	0.9515 1.2112	Ave		1.0678				9.2		15.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Seattle Job No.: 580-45117-1 Analy Batch No.: 168147

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/26/2014 16:18 Calibration End Date: 08/26/2014 20:00 Calibration ID: 17850

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
1,2,4-Trichlorobenzene	+++++ 0.8791	0.7293 0.9056	0.7311 1.0085	0.6796 1.0584	0.7582 1.0490	Lin1	-0.080	1.0336							0.9980		0.9900
Hexachlorobutadiene	+++++ 0.4308	0.4405 0.4163	0.4394 0.4401	0.3809 0.4513	0.3862 0.4434	Ave		0.4254				6.0		15.0			
Naphthalene	+++++ 1.2829	0.8705 1.4400	0.7555 1.6520	0.7557 1.7436	0.8483 1.6785	Lin1	-0.212	1.6708							0.9960		0.9900
1,2,3-Trichlorobenzene	+++++ 0.7551	0.6778 0.7661	0.6549 0.8507	0.5880 0.8835	0.6530 0.8493	Ave		0.7421				14.0		15.0			
Dibromofluoromethane (Surr)	0.2805 0.2823	0.2745 0.2807	0.2790 0.2872	0.2831 0.2870	0.2861 0.2890	Ave		0.2829				1.6		15.0			
1,2-Dichloroethane-d4 (Surr)	0.2733 0.2727	0.2719 0.2805	0.2808 0.2824	0.2784 0.2772	0.2752 0.2768	Ave		0.2769				1.3		15.0			
Trifluorotoluene (Surr)	+++++ 1.1028	1.3979 1.0920	0.9919 1.1287	1.0791 1.1857	1.0800 1.1790	Ave		1.1375				10.0		15.0			
Toluene-d8 (Surr)	1.1855 1.2155	1.1923 1.2260	1.1931 1.1918	1.1953 1.1784	1.2078 1.1454	Ave		1.1931				1.8		15.0			
4-Bromofluorobenzene (Surr)	0.4344 0.4598	0.4307 0.4512	0.4339 0.4506	0.4426 0.4440	0.4409 0.4414	Ave		0.4430				2.0		15.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Seattle Job No.: 580-45117-1 Analy Batch No.: 168147

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/26/2014 16:18 Calibration End Date: 08/26/2014 20:00 Calibration ID: 17850

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD00002 580-168147/3	I0344143.D
Level 2	STD0001 580-168147/4	I0344144.D
Level 3	STD0002 580-168147/5	I0344145.D
Level 4	STD0004 580-168147/6	I0344146.D
Level 5	STD001 580-168147/7	I0344147.D
Level 6	STD005 580-168147/8	I0344148.D
Level 7	ICIS 580-168147/9	I0344149.D
Level 8	STD025 580-168147/10	I0344150.D
Level 9	STD050 580-168147/11	I0344151.D
Level 10	STD080 580-168147/12	I0344152.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Dichlorodifluoromethane	FB	Ave	+++++ 186671	3582 367354	6979 956101	14301 2017478	39030 3228199	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Chloromethane	FB	Lin2	+++++ 134561	4275 271940	5584 693905	12834 1389980	26104 2325652	+++++ 5.00	0.1000 10.00	0.200 25.0	0.400 50.0	1.000 80.0
Vinyl chloride	FB	Ave	697 134853	3622 264219	5390 695111	10270 1435330	26579 2339831	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Bromomethane	FB	Lin2	+++++ 96751	3785 180483	5240 400392	8733 +++++	18975 +++++	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 +++++	1.00 +++++
Chloroethane	FB	Qua1	+++++ 20682	+++++ 41187	994 96206	2168 166737	5245 +++++	+++++ 5.00	+++++ 10.0	0.200 25.0	0.400 50.0	1.00 +++++
Trichlorofluoromethane	FB	Ave	+++++ 183700	4012 370168	6976 989319	13046 2006172	39827 3099218	+++++ 5.00	0.1000 10.00	0.200 25.0	0.400 50.0	1.000 80.0
Acrolein	FB	Lin1	+++++ 29915	1194 57109	2572 147110	2845 304299	7525 503593	+++++ 29.6	0.593 59.3	1.19 148	2.37 296	5.93 474
1,1,2-Trichloro-1,2,2-trifluoroetha ne	FB	Ave	556 117697	2858 232534	4509 600904	7905 1212905	23035 1916115	0.0200 5.00	0.1000 10.00	0.200 25.0	0.400 50.0	1.000 80.0
1,1-Dichloroethene	FB	Ave	+++++ 119901	2885 240239	5168 598955	9162 1242810	25271 1987657	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Acetone	FB	Lin1	+++++ 73418	9046 138632	11726 332610	13182 654337	22459 1023799	+++++ 20.0	0.400 40.0	0.800 100	1.60 200	4.00 320
Iodomethane	FB	Ave	+++++ 265811	6545 528406	9652 1329174	19750 2715536	51479 4353942	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Carbon disulfide	FB	Ave	+++++ 316761	7277 651105	11974 1654833	21134 3533047	62267 5626158	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Methylene Chloride	FB	Lin2	5229 123269	7284 240025	8674 572982	13360 1177712	27514 1838818	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
2-Methyl-2-propanol	FB	Ave	+++++ 58385	1733 127740	3172 324105	4869 629285	13108 1122832	+++++ 50.0	1.00 100	2.00 250	4.00 500	10.0 800

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Seattle Job No.: 580-45117-1 Analy Batch No.: 168147

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/26/2014 16:18 Calibration End Date: 08/26/2014 20:00 Calibration ID: 17850

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Methyl tert-butyl ether	FB	Ave	+++++ 236478	4642 478500	9006 1176593	16980 2406677	48136 3833227	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
trans-1,2-Dichloroethene	FB	Ave	+++++ 123458	3065 246048	5007 619295	10325 1275728	23818 2005826	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Acrylonitrile	FB	Ave	+++++ 198110	5351 398861	8319 985606	16731 1984028	39954 3118422	+++++ 50.0	1.00 100	2.00 250	4.00 500	10.0 800
n-Hexane	FB	Lin2	+++++ 118408	3749 237945	5573 568967	8969 1205210	24658 1891205	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,1-Dichloroethane	FB	Ave	+++++ 198701	4844 398459	8051 979609	15146 2004651	39069 3163344	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Vinyl acetate	FB	Lin1	+++++ 12717	246 27211	845 68508	911 138516	2827 198219	+++++ 10.0	0.200 20.0	0.401 50.1	0.801 100	2.00 160
Tert-butyl ethyl ether	FB	Ave	521 117439	2604 232632	4876 600597	8353 1204194	23601 1942072	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
2,2-Dichloropropane	FB	Lin2	+++++ 92600	2634 175249	4182 441169	7602 889776	19400 1394530	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
cis-1,2-Dichloroethene	FB	Ave	+++++ 137404	3024 276533	5220 697938	10511 1459195	27265 2419326	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
2-Butanone	FB	Lin2	+++++ 11243	326 21599	561 56112	1001 109935	2719 179732	+++++ 20.0	0.400 40.0	0.800 100	1.60 200	4.00 320
Chlorobromomethane	FB	Ave	+++++ 82829	1527 173627	3439 436916	5712 924684	16711 1533256	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Chloroform	FB	Ave	+++++ 240699	4535 479588	8929 1214492	17420 2546148	48224 4101030	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,1,1-Trichloroethane	FB	Ave	+++++ 181273	4038 371790	5937 959034	12012 2028068	34465 3247881	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,1-Dichloropropene	FB	Ave	+++++ 161566	3452 330824	5773 834656	11571 1753338	30490 2865437	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Carbon tetrachloride	FB	Ave	+++++ 166466	3461 361980	6230 965695	10815 2038284	31385 3311629	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Benzene	FB	Ave	+++++ 481720	11078 968576	18050 2466149	36446 5151722	94686 8264236	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2-Dichloroethane	FB	Ave	+++++ 145012	3679 313826	5823 778788	11027 1532548	28850 2529927	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Tert-amyl methyl ether	FB	Ave	+++++ 247334	4870 528711	9049 1353670	17089 2860507	50419 4632117	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Trichloroethene	FB	Ave	585 137177	2982 283071	4984 712482	9226 1559167	26342 2609830	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2-Dichloropropane	FB	Ave	+++++ 119316	2332 249240	4565 618581	9453 1282159	23119 2061856	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Dibromomethane	FB	Ave	+++++ 71840	1465 154595	2866 387054	5088 808869	13016 1340855	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Seattle Job No.: 580-45117-1 Analy Batch No.: 168147

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/26/2014 16:18 Calibration End Date: 08/26/2014 20:00 Calibration ID: 17850

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Dichlorobromomethane	FB	Ave	711 152926	2666 329494	5426 876944	9485 1874505	28530 3077500	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
2-Chloroethyl vinyl ether	CBZ	Ave	+++++ 44836	+++++ 100641	1604 268681	2686 559918	7110 939373	+++++ 5.00	+++++ 10.0	0.200 25.0	0.400 50.0	1.00 80.0
cis-1,3-Dichloropropene	CBZ	Lin1	+++++ 154727	2924 346559	4674 914587	8555 1919213	25667 3180281	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
4-Methyl-2-pentanone	CBZ	Lin1	308 100748	1530 215961	2730 554658	5479 1147651	16812 1885806	0.0800 20.0	0.400 40.0	0.800 100	1.60 200	4.00 320
Toluene	CBZ	Ave	+++++ 481714	8912 1013342	17851 2565790	35440 5505375	94567 8442327	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
trans-1,3-Dichloropropene	CBZ	Lin1	+++++ 112467	2052 256537	3625 688119	6749 1507607	19758 2548217	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,1,2-Trichloroethane	CBZ	Ave	+++++ 85641	1480 177331	3448 451535	5899 936143	16428 1531940	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Tetrachloroethene	CBZ	Ave	654 183873	3716 384922	6625 1007576	11217 2242253	34527 3961273	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,3-Dichloropropane	CBZ	Ave	+++++ 134747	2530 295006	4847 734473	9126 1537306	25774 2517858	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
2-Hexanone	CBZ	Lin1	+++++ 88507	1350 205905	2809 518312	5108 1075107	15176 1753626	+++++ 20.0	0.400 40.0	0.800 100	1.60 200	4.00 320
Chlorodibromomethane	CBZ	Lin1	+++++ 99896	1832 222075	3047 601639	5894 1335966	18092 2243453	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2-Dibromoethane	CBZ	Ave	+++++ 87712	1473 186468	2641 480006	5750 995671	15554 1631490	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Chlorobenzene	CBZ	Ave	+++++ 327765	6545 697083	12975 1776291	23461 3837584	66450 6191476	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,1,1,2-Tetrachloroethane	CBZ	Ave	+++++ 114554	1880 246552	3665 654306	6693 1428170	21463 2391619	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Ethylbenzene	CBZ	Ave	2082 410126	11473 1121711	17397 2938696	35301 6240447	99646 +++++	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 +++++
m-Xylene & p-Xylene	CBZ	Ave	1649 410126	7237 879267	13583 2293225	24644 4844143	73645 7066346	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
o-Xylene	CBZ	Lin1	1476 415130	6211 889613	11572 2363333	23263 5015118	69648 7162270	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Styrene	CBZ	Lin1	1230 336696	4457 722986	9355 1875280	17204 4134976	56897 6420180	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Bromoform	CBZ	Lin1	+++++ 53367	975 122548	1538 341526	3386 758540	8950 1327949	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Isopropylbenzene	CBZ	Lin1	1899 508603	7946 1100572	13594 2886991	25634 6080571	85370 9165729	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,1,2,2-Tetrachloroethane	DCB	Ave	+++++ 96796	2570 200303	3545 514156	6836 1049204	19673 1692534	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Seattle Job No.: 580-45117-1 Analy Batch No.: 168147

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/26/2014 16:18 Calibration End Date: 08/26/2014 20:00 Calibration ID: 17850

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Bromobenzene	DCB	Ave	610 147237	3248 317260	4972 834002	11051 1774486	28003 3087960	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
trans-1,4-Dichloro-2-butene	DCB	Ave	+++++ 24520	+++++ 52643	1110 140363	1276 282861	4475 452056	+++++ 5.00	+++++ 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2,3-Trichloropropane	DCB	Ave	+++++ 26432	660 58878	781 147498	1650 304445	5560 502544	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
N-Propylbenzene	DCB	Ave	2462 608228	10205 1308429	18871 3418870	38247 6643932	112211 8196824	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
2-Chlorotoluene	DCB	Ave	498 131513	2119 276812	4928 712588	7335 1552674	23592 2655647	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,3,5-Trimethylbenzene	DCB	Lin1	1390 435448	6302 921707	12279 2372533	23425 5101405	70517 7676039	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
4-Chlorotoluene	DCB	Ave	432 139545	2353 284335	4276 735538	8509 1596218	24525 2725455	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
tert-Butylbenzene	DCB	Lin1	+++++ 353588	5472 760177	9431 2029860	19029 4602732	58810 8459267	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2,4-Trimethylbenzene	DCB	Lin1	+++++ 452620	6256 953665	9852 2479206	21694 5266574	73031 8454673	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
sec-Butylbenzene	DCB	Lin1	1874 527892	6946 1107913	13119 2974076	28115 6213198	85669 9540897	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
4-Isopropyltoluene	DCB	Lin1	1352 449743	4675 972388	10467 2572493	20217 5560620	69814 8517782	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,3-Dichlorobenzene	DCB	Ave	1301 287523	5013 587095	9577 1532690	19801 3220984	54171 5562015	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,4-Dichlorobenzene	DCB	Ave	1525 290275	6800 597424	10552 1555563	20131 3323546	57311 5666224	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
n-Butylbenzene	DCB	Lin1	346 101485	1601 215374	2382 585666	5566 1246867	14844 2121037	0.0200 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2-Dichlorobenzene	DCB	Ave	+++++ 255485	5076 537381	7892 1389661	18065 2911063	49062 4919632	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2-Dibromo-3-Chloropropane	DCB	Lin1	+++++ 15296	185 32067	949 92999	888 205543	2425 347791	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,3,5-Trichlorobenzene	DCB	Ave	+++++ 184982	3625 398043	7196 1076058	13047 2359576	34049 4083888	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2,4-Trichlorobenzene	DCB	Lin1	+++++ 155756	2561 339280	5146 950417	9397 2078968	27134 3537132	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Hexachlorobutadiene	DCB	Ave	+++++ 76323	1547 155978	3093 414786	5267 886441	13819 1495152	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
Naphthalene	DCB	Lin1	+++++ 227295	3057 539499	5318 1556870	10449 3424919	30357 5659700	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0
1,2,3-Trichlorobenzene	DCB	Ave	+++++ 133789	2380 287011	4610 801745	8131 1735493	23368 2863837	+++++ 5.00	0.100 10.0	0.200 25.0	0.400 50.0	1.00 80.0

FORM VI
GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Seattle Job No.: 580-45117-1 Analy Batch No.: 168147

SDG No.:

Instrument ID: SEA015 GC Column: ZB-624short ID: 0.18(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/26/2014 16:18 Calibration End Date: 08/26/2014 20:00 Calibration ID: 17850

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Dibromofluoromethane (Surr)	FB	Ave	359417	349580	347557	344713	355362	15.0	15.0	15.0	15.0	15.0
			353150	360449	369302	388734	407448	15.0	15.0	15.0	15.0	15.0
1,2-Dichloroethane-d4 (Surr)	FB	Ave	350164	346282	349824	339090	341771	15.0	15.0	15.0	15.0	15.0
			341194	360204	363053	375518	390303	15.0	15.0	15.0	15.0	15.0
Trifluorotoluene (Surr)	DCB	Ave	+++++	4907	6979	14915	38632	+++++	0.1000	0.200	0.400	1.000
			195315	408967	1063275	2328182	3973904	5.00	10.00	25.0	50.0	80.0
Toluene-d8 (Surr)	CBZ	Ave	1150230	1127291	1116938	1082025	1124260	15.0	15.0	15.0	15.0	15.0
			1128006	1207560	1193830	1257359	1311931	15.0	15.0	15.0	15.0	15.0
4-Bromofluorobenzene (Surr)	CBZ	Ave	421474	407236	406207	400651	410414	15.0	15.0	15.0	15.0	15.0
			426739	444387	451418	473743	505586	15.0	15.0	15.0	15.0	15.0

Curve Type Legend:

Ave = Average ISTD
Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD
Qua1 = Quadratic 1/conc ISTD

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab Sample ID: ICV 580-168147/14 Calibration Date: 08/26/2014 20:48

Instrument ID: SEA015 Calib Start Date: 08/26/2014 16:18

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 08/26/2014 20:00

Lab File ID: I0344154.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.4392	0.3130		7.13	10.0	-28.7*	25.0
Chloromethane	Lin2		0.2810	0.1000	8.94	10.0	-10.6	25.0
Vinyl chloride	Ave	0.3382	0.2953		8.73	10.0	-12.7	25.0
Bromomethane	Lin2		0.2118		10.2	10.0	1.5	25.0
Chloroethane	Qua1		0.0475		9.65	10.0	-3.5	25.0
Trichlorofluoromethane	Ave	0.4407	0.4389		9.96	10.0	-0.4	25.0
Acrolein	Lin1		0.0153		78.4	58.8	33.4	40.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.2813	0.2610		9.28	10.0	-7.2	40.0
1,1-Dichloroethene	Ave	0.2917	0.2659		9.11	10.0	-8.9	25.0
Acetone	Lin1		0.0395		41.8	40.0	4.5	25.0
Iodomethane	Ave	0.6264	0.6285		10.0	10.0	0.3	40.0
Carbon disulfide	Ave	0.7560	0.7488		9.91	10.0	-0.9	25.0
Methylene Chloride	Lin2		0.2855		10.4	10.0	4.4	25.0
2-Methyl-2-propanol	Ave	0.0159	0.0134		84.0	100	-16.0	40.0
Methyl tert-butyl ether	Ave	0.5457	0.5489		10.1	10.0	0.6	25.0
trans-1,2-Dichloroethene	Ave	0.2989	0.2880		9.64	10.0	-3.6	25.0
Acrylonitrile	Ave	0.0487	0.0441		90.4	100	-9.6	40.0
n-Hexane	Lin2		0.2796		10.5	10.0	4.8	40.0
1,1-Dichloroethane	Ave	0.4730	0.4676	0.1000	9.88	10.0	-1.2	25.0
Vinyl acetate	Lin1		0.0198		27.4	20.0	36.9	40.0
Tert-butyl ethyl ether	Ave	0.2806	0.2761		9.90	10.1	-1.6	40.0
2,2-Dichloropropane	Lin2		0.2125		10.3	10.0	3.0	25.0
cis-1,2-Dichloroethene	Ave	0.3274	0.3284		10.0	10.0	0.3	25.0
2-Butanone	Lin2		0.0061		36.6	40.0	-8.5	25.0
Chlorobromomethane	Ave	0.1976	0.2018		10.2	10.0	2.1	25.0
Chloroform	Ave	0.5560	0.5557		9.99	10.0	-0.0	25.0
1,1,1-Trichloroethane	Ave	0.4241	0.4360		10.3	10.0	2.8	25.0
1,1-Dichloropropene	Ave	0.3791	0.4087		10.8	10.0	7.8	25.0
Carbon tetrachloride	Ave	0.4066	0.4218		10.4	10.0	3.7	25.0
Benzene	Ave	1.148	1.134		9.88	10.0	-1.2	25.0
1,2-Dichloroethane	Ave	0.3584	0.3431		9.57	10.0	-4.3	25.0
Tert-amyl methyl ether	Ave	0.5940	0.7031		11.9	10.1	18.4	40.0
Trichloroethene	Ave	0.3281	0.3302		10.1	10.0	0.7	25.0
1,2-Dichloropropane	Ave	0.2827	0.2605		9.22	10.0	-7.8	25.0
Dibromomethane	Ave	0.1722	0.1711		9.94	10.0	-0.6	25.0
Dichlorobromomethane	Ave	0.3679	0.3556		9.67	10.0	-3.3	25.0
2-Chloroethyl vinyl ether	Ave	0.1406	0.1312		9.34	10.0	-6.6	40.0
cis-1,3-Dichloropropene	Lin1		0.4951		9.39	10.0	-6.1	25.0
4-Methyl-2-pentanone	Lin1		0.0781		39.4	40.0	-1.4	25.0
Toluene	Ave	1.489	1.513		10.2	10.0	1.6	25.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab Sample ID: ICV 580-168147/14 Calibration Date: 08/26/2014 20:48

Instrument ID: SEA015 Calib Start Date: 08/26/2014 16:18

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 08/26/2014 20:00

Lab File ID: I0344154.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
trans-1,3-Dichloropropene	Lin1		0.3960		9.59	10.0	-4.1	25.0
1,1,2-Trichloroethane	Ave	0.2613	0.2472		9.46	10.0	-5.4	25.0
Tetrachloroethene	Ave	0.5710	0.5571		9.76	10.0	-2.4	25.0
1,3-Dichloropropane	Ave	0.4169	0.4045		9.70	10.0	-3.0	25.0
2-Hexanone	Lin1		0.0694		37.6	40.0	-6.0	25.0
Chlorodibromomethane	Lin1		0.3171		8.73	10.0	-12.7	25.0
1,2-Dibromoethane	Ave	0.2596	0.2632		10.1	10.0	1.4	25.0
Chlorobenzene	Ave	1.044	1.036	0.3000	9.92	10.0	-0.8	25.0
1,1,1,2-Tetrachloroethane	Ave	0.3495	0.3755		10.7	10.0	7.4	25.0
Ethylbenzene	Ave	1.604	1.697		10.6	10.0	5.8	25.0
m-Xylene & p-Xylene	Ave	1.228	1.335		10.9	10.0	8.8	25.0
o-Xylene	Lin1		1.378		10.7	10.0	6.7	25.0
Styrene	Lin1		1.073		9.80	10.0	-2.0	25.0
Bromoform	Lin1		0.1719	0.1000	8.22	10.0	-17.8	25.0
Isopropylbenzene	Lin1		1.677		10.4	10.0	4.4	25.0
1,1,2,2-Tetrachloroethane	Ave	0.5491	0.5150	0.3000	9.38	10.0	-6.2	25.0
Bromobenzene	Ave	0.8452	0.8186		9.69	10.0	-3.1	25.0
1,2,3-Trichloropropane	Ave	0.1489	0.1468		9.86	10.0	-1.4	25.0
N-Propylbenzene	Ave	3.131	3.463		11.1	10.0	10.6	25.0
trans-1,4-Dichloro-2-butene	Ave	0.1351	0.1311		9.71	10.0	-2.9	40.0
2-Chlorotoluene	Ave	0.7008	0.7429		10.6	10.0	6.0	25.0
1,3,5-Trimethylbenzene	Lin1		2.387		9.88	10.0	-1.2	25.0
4-Chlorotoluene	Ave	0.7133	0.7580		10.6	10.0	6.3	25.0
tert-Butylbenzene	Lin1		2.099		8.96	10.0	-10.4	25.0
1,2,4-Trimethylbenzene	Lin1		2.503		9.76	10.0	-2.4	25.0
sec-Butylbenzene	Lin1		3.019		10.1	10.0	1.4	25.0
4-Isopropyltoluene	Lin1		2.554		9.68	10.0	-3.2	25.0
1,3-Dichlorobenzene	Ave	1.567	1.559		9.95	10.0	-0.5	25.0
1,4-Dichlorobenzene	Ave	1.689	1.582		9.37	10.0	-6.3	25.0
n-Butylbenzene	Lin1		0.5987		9.63	10.0	-3.7	25.0
1,2-Dichlorobenzene	Ave	1.393	1.432		10.3	10.0	2.8	25.0
1,2-Dibromo-3-Chloropropane	Lin1		0.0885		8.78	10.0	-12.2	25.0
1,3,5-Trichlorobenzene	Ave	1.068	1.150		10.8	10.0	7.7	25.0
1,2,4-Trichlorobenzene	Lin1		0.9687		9.45	10.0	-5.5	25.0
Hexachlorobutadiene	Ave	0.4254	0.4327		10.2	10.0	1.7	25.0
Naphthalene	Lin1		1.487		9.02	10.0	-9.8	25.0
1,2,3-Trichlorobenzene	Ave	0.7421	0.8262		11.1	10.0	11.3	25.0
Dibromofluoromethane (Surr)	Ave	0.2829	0.2831		15.0	15.0	0.0	25.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2769	0.2742		14.9	15.0	-1.0	25.0
Trifluorotoluene (Surr)	Ave	1.137	0.9647		1.70	2.00	-15.2	25.0
Toluene-d8 (Surr)	Ave	1.193	1.193		15.0	15.0	-0.0	25.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab Sample ID: ICV 580-168147/14 Calibration Date: 08/26/2014 20:48

Instrument ID: SEA015 Calib Start Date: 08/26/2014 16:18

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 08/26/2014 20:00

Lab File ID: I0344154.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
4-Bromofluorobenzene (Surr)	Ave	0.4430	0.4502		15.2	15.0	1.6	25.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab Sample ID: CCVIS 580-168317/3 Calibration Date: 08/28/2014 11:10

Instrument ID: SEA015 Calib Start Date: 08/26/2014 16:18

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 08/26/2014 20:00

Lab File ID: I0344186.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.4392	0.4168		9.49	10.0	-5.1	50.0
Chloromethane	Lin2		0.3290	0.1000	10.5	10.0	4.8	50.0
Vinyl chloride	Ave	0.3382	0.3265		9.66	10.0	-3.4	20.0
Bromomethane	Lin2		0.2265		10.9	10.0	8.7	50.0
Chloroethane	Qua1		0.0504		10.3	10.0	2.9	50.0
Trichlorofluoromethane	Ave	0.4407	0.4666		10.6	10.0	5.9	50.0
Acrolein	Lin1		0.0125		64.2	59.3	8.4	50.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.2813	0.2668		9.48	10.0	-5.2	50.0
1,1-Dichloroethene	Ave	0.2917	0.2646		9.07	10.0	-9.3	20.0
Acetone	Lin1		0.0344		36.1	40.0	-9.8	50.0
Iodomethane	Ave	0.6264	0.6193		9.89	10.0	-1.1	50.0
Carbon disulfide	Ave	0.7560	0.7557		10.0	10.0	-0.0	50.0
Methylene Chloride	Lin2		0.2749		10.0	10.0	0.4	40.0
2-Methyl-2-propanol	Ave	0.0159	0.0123		77.4	100	-22.6	50.0
Methyl tert-butyl ether	Ave	0.5457	0.5533		10.1	10.0	1.4	30.0
trans-1,2-Dichloroethene	Ave	0.2989	0.2852		9.54	10.0	-4.6	30.0
Acrylonitrile	Ave	0.0487	0.0453		93.0	100	-7.0	50.0
n-Hexane	Lin2		0.2943		11.0	10.0	10.4	40.0
1,1-Dichloroethane	Ave	0.4730	0.4624	0.1000	9.78	10.0	-2.2	30.0
Vinyl acetate	Lin1		0.0211		29.2	20.0	45.9	50.0
Tert-butyl ethyl ether	Ave	0.2806	0.2738		9.76	10.0	-2.4	30.0
2,2-Dichloropropane	Lin2		0.2495		12.1	10.0	21.0	40.0
cis-1,2-Dichloroethene	Ave	0.3274	0.3190		9.74	10.0	-2.6	30.0
2-Butanone	Lin2		0.0057		34.6	40.0	-13.6	50.0
Chlorobromomethane	Ave	0.1976	0.1976		10.0	10.0	-0.0	40.0
Chloroform	Ave	0.5560	0.5531		9.95	10.0	-0.5	20.0
1,1,1-Trichloroethane	Ave	0.4241	0.4494		10.6	10.0	6.0	30.0
1,1-Dichloropropene	Ave	0.3791	0.3893		10.3	10.0	2.7	30.0
Carbon tetrachloride	Ave	0.4066	0.4038		9.93	10.0	-0.7	30.0
Benzene	Ave	1.148	1.149		10.0	10.0	0.0	30.0
1,2-Dichloroethane	Ave	0.3584	0.3523		9.83	10.0	-1.7	30.0
Tert-amyl methyl ether	Ave	0.5940	0.6129		10.3	10.0	3.2	40.0
Trichloroethene	Ave	0.3281	0.3198		9.75	10.0	-2.5	30.0
1,2-Dichloropropane	Ave	0.2827	0.2890		10.2	10.0	2.2	20.0
Dibromomethane	Ave	0.1722	0.1698		9.86	10.0	-1.4	30.0
Dichlorobromomethane	Ave	0.3679	0.3841		10.4	10.0	4.4	30.0
2-Chloroethyl vinyl ether	Ave	0.1406	0.1537		10.9	10.0	9.3	50.0
cis-1,3-Dichloropropene	Lin1		0.5281		10.0	10.0	0.1	30.0
4-Methyl-2-pentanone	Lin1		0.0816		41.2	40.0	3.0	50.0
Toluene	Ave	1.489	1.547		10.4	10.0	3.9	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab Sample ID: CCVIS 580-168317/3 Calibration Date: 08/28/2014 11:10

Instrument ID: SEA015 Calib Start Date: 08/26/2014 16:18

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 08/26/2014 20:00

Lab File ID: I0344186.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
trans-1,3-Dichloropropene	Lin1		0.4067		9.85	10.0	-1.5	30.0
1,1,2-Trichloroethane	Ave	0.2613	0.2720		10.4	10.0	4.1	30.0
Tetrachloroethene	Ave	0.5710	0.3505		6.14	10.0	-38.6	40.0
1,3-Dichloropropane	Ave	0.4169	0.4349		10.4	10.0	4.3	30.0
2-Hexanone	Lin1		0.0734		39.8	40.0	-0.6	50.0
Chlorodibromomethane	Lin1		0.3329		9.16	10.0	-8.4	40.0
1,2-Dibromoethane	Ave	0.2596	0.2760		10.6	10.0	6.3	30.0
Chlorobenzene	Ave	1.044	1.070	0.3000	10.2	10.0	2.4	30.0
1,1,1,2-Tetrachloroethane	Ave	0.3495	0.3799		10.9	10.0	8.7	30.0
Ethylbenzene	Ave	1.604	1.813		11.3	10.0	13.0	20.0
m-Xylene & p-Xylene	Ave	1.228	1.359		11.1	10.0	10.7	30.0
o-Xylene	Lin1		1.387		10.7	10.0	7.5	30.0
Styrene	Lin1		1.126		10.3	10.0	2.8	30.0
Bromoform	Lin1		0.1766	0.1000	8.44	10.0	-15.6	40.0
Isopropylbenzene	Lin1		1.678		10.5	10.0	4.5	30.0
1,1,2,2-Tetrachloroethane	Ave	0.5491	0.5398	0.3000	9.83	10.0	-1.7	30.0
Bromobenzene	Ave	0.8452	0.8368		9.90	10.0	-1.0	30.0
1,2,3-Trichloropropane	Ave	0.1489	0.1534		10.3	10.0	3.0	30.0
N-Propylbenzene	Ave	3.131	3.576		11.4	10.0	14.2	30.0
trans-1,4-Dichloro-2-butene	Ave	0.1351	0.1360		10.1	10.0	0.7	50.0
2-Chlorotoluene	Ave	0.7008	0.7480		10.7	10.0	6.7	30.0
1,3,5-Trimethylbenzene	Lin1		2.469		10.2	10.0	2.2	30.0
4-Chlorotoluene	Ave	0.7133	0.7763		10.9	10.0	8.8	30.0
tert-Butylbenzene	Lin1		2.178		9.29	10.0	-7.1	30.0
1,2,4-Trimethylbenzene	Lin1		2.581		10.1	10.0	0.6	30.0
sec-Butylbenzene	Lin1		3.015		10.1	10.0	1.2	30.0
4-Isopropyltoluene	Lin1		2.652		10.1	10.0	0.5	30.0
1,3-Dichlorobenzene	Ave	1.567	1.551		9.90	10.0	-1.0	30.0
1,4-Dichlorobenzene	Ave	1.689	1.583		9.37	10.0	-6.3	30.0
n-Butylbenzene	Lin1		0.5945		9.56	10.0	-4.4	30.0
1,2-Dichlorobenzene	Ave	1.393	1.427		10.2	10.0	2.5	30.0
1,2-Dibromo-3-Chloropropane	Lin1		0.0803		7.97	10.0	-20.3	50.0
1,3,5-Trichlorobenzene	Ave	1.068	1.091		10.2	10.0	2.2	30.0
1,2,4-Trichlorobenzene	Lin1		0.9251		9.03	10.0	-9.7	40.0
Hexachlorobutadiene	Ave	0.4254	0.4375		10.3	10.0	2.8	40.0
Naphthalene	Lin1		1.404		8.53	10.0	-14.7	40.0
1,2,3-Trichlorobenzene	Ave	0.7421	0.7924		10.7	10.0	6.8	40.0
Dibromofluoromethane (Surr)	Ave	0.2829	0.2767		14.7	15.0	-2.2	
1,2-Dichloroethane-d4 (Surr)	Ave	0.2769	0.2655		14.4	15.0	-4.1	
Trifluorotoluene (Surr)	Ave	1.137	1.081		9.50	10.0	-4.9	
Toluene-d8 (Surr)	Ave	1.193	1.225		15.4	15.0	2.7	

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab Sample ID: CCVIS 580-168317/3 Calibration Date: 08/28/2014 11:10

Instrument ID: SEA015 Calib Start Date: 08/26/2014 16:18

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 08/26/2014 20:00

Lab File ID: I0344186.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
4-Bromofluorobenzene (Surr)	Ave	0.4430	0.4541		15.4	15.0	2.5	

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab Sample ID: CCVIS 580-168393/3 Calibration Date: 08/29/2014 07:37

Instrument ID: SEA015 Calib Start Date: 08/26/2014 16:18

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 08/26/2014 20:00

Lab File ID: I0344217.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.4392	0.4225		9.62	10.0	-3.8	50.0
Chloromethane	Lin2		0.3292	0.1000	10.5	10.0	4.8	50.0
Vinyl chloride	Ave	0.3382	0.3398		10.0	10.0	0.5	20.0
Bromomethane	Lin2		0.2461		11.8	10.0	18.2	50.0
Chloroethane	Qua1		0.0539		11.1	10.0	10.6	50.0
Trichlorofluoromethane	Ave	0.4407	0.4822		10.9	10.0	9.4	50.0
Acrolein	Lin1		0.0112		57.7	59.3	-2.5	50.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.2813	0.2745		9.76	10.0	-2.4	50.0
1,1-Dichloroethene	Ave	0.2917	0.2766		9.48	10.0	-5.2	20.0
Acetone	Lin1		0.0349		36.6	40.0	-8.5	50.0
Iodomethane	Ave	0.6264	0.6434		10.3	10.0	2.7	50.0
Carbon disulfide	Ave	0.7560	0.7650		10.1	10.0	1.2	50.0
Methylene Chloride	Lin2		0.2872		10.5	10.0	5.0	40.0
2-Methyl-2-propanol	Ave	0.0159	0.0122		76.8	100	-23.2	50.0
Methyl tert-butyl ether	Ave	0.5457	0.5328		9.76	10.0	-2.4	30.0
trans-1,2-Dichloroethene	Ave	0.2989	0.2999		10.0	10.0	0.3	30.0
Acrylonitrile	Ave	0.0487	0.0446		91.5	100	-8.5	50.0
n-Hexane	Lin2		0.2876		10.8	10.0	7.9	40.0
1,1-Dichloroethane	Ave	0.4730	0.4806	0.1000	10.2	10.0	1.6	30.0
Vinyl acetate	Lin1		0.0189		26.2	20.0	30.9	50.0
Tert-butyl ethyl ether	Ave	0.2806	0.2786		9.93	10.0	-0.7	30.0
2,2-Dichloropropane	Lin2		0.2499		12.1	10.0	21.2	40.0
cis-1,2-Dichloroethene	Ave	0.3274	0.3304		10.1	10.0	0.9	30.0
2-Butanone	Lin2		0.0059		35.3	40.0	-11.7	50.0
Chlorobromomethane	Ave	0.1976	0.1969		9.96	10.0	-0.4	40.0
Chloroform	Ave	0.5560	0.5704		10.3	10.0	2.6	20.0
1,1,1-Trichloroethane	Ave	0.4241	0.4507		10.6	10.0	6.3	30.0
1,1-Dichloropropene	Ave	0.3791	0.3888		10.3	10.0	2.6	30.0
Carbon tetrachloride	Ave	0.4066	0.4149		10.2	10.0	2.0	30.0
Benzene	Ave	1.148	1.151		10.0	10.0	0.3	30.0
1,2-Dichloroethane	Ave	0.3584	0.3526		9.84	10.0	-1.6	30.0
Tert-amyl methyl ether	Ave	0.5940	0.5962		10.0	10.0	0.4	40.0
Trichloroethene	Ave	0.3281	0.3247		9.90	10.0	-1.0	30.0
1,2-Dichloropropane	Ave	0.2827	0.2913		10.3	10.0	3.1	20.0
Dibromomethane	Ave	0.1722	0.1699		9.86	10.0	-1.4	30.0
Dichlorobromomethane	Ave	0.3679	0.3699		10.1	10.0	0.5	30.0
2-Chloroethyl vinyl ether	Ave	0.1406	0.1402		9.97	10.0	-0.3	50.0
cis-1,3-Dichloropropene	Lin1		0.5078		9.63	10.0	-3.7	30.0
4-Methyl-2-pentanone	Lin1		0.0749		37.8	40.0	-5.5	50.0
Toluene	Ave	1.489	1.584		10.6	10.0	6.4	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab Sample ID: CCVIS 580-168393/3 Calibration Date: 08/29/2014 07:37

Instrument ID: SEA015 Calib Start Date: 08/26/2014 16:18

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 08/26/2014 20:00

Lab File ID: I0344217.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
trans-1,3-Dichloropropene	Lin1		0.3664		8.88	10.0	-11.2	30.0
1,1,2-Trichloroethane	Ave	0.2613	0.2605		9.97	10.0	-0.3	30.0
Tetrachloroethene	Ave	0.5710	0.3551		6.22	10.0	-37.8	40.0
1,3-Dichloropropane	Ave	0.4169	0.4268		10.2	10.0	2.4	30.0
2-Hexanone	Lin1		0.0658		35.7	40.0	-10.8	50.0
Chlorodibromomethane	Lin1		0.3147		8.66	10.0	-13.4	40.0
1,2-Dibromoethane	Ave	0.2596	0.2663		10.3	10.0	2.6	30.0
Chlorobenzene	Ave	1.044	1.088	0.3000	10.4	10.0	4.2	30.0
1,1,1,2-Tetrachloroethane	Ave	0.3495	0.3704		10.6	10.0	6.0	30.0
Ethylbenzene	Ave	1.604	1.775		11.1	10.0	10.6	20.0
m-Xylene & p-Xylene	Ave	1.228	1.373		11.2	10.0	11.8	30.0
o-Xylene	Lin1		1.434		11.1	10.0	11.1	30.0
Styrene	Lin1		1.123		10.3	10.0	2.5	30.0
Bromoform	Lin1		0.1602	0.1000	7.66	10.0	-23.4	40.0
Isopropylbenzene	Lin1		1.727		10.8	10.0	7.5	30.0
1,1,2,2-Tetrachloroethane	Ave	0.5491	0.5175	0.3000	9.42	10.0	-5.8	30.0
Bromobenzene	Ave	0.8452	0.8305		9.83	10.0	-1.7	30.0
trans-1,4-Dichloro-2-butene	Ave	0.1351	0.1344		9.94	10.0	-0.6	50.0
1,2,3-Trichloropropane	Ave	0.1489	0.1452		9.75	10.0	-2.5	30.0
N-Propylbenzene	Ave	3.131	3.608		11.5	10.0	15.2	30.0
2-Chlorotoluene	Ave	0.7008	0.7528		10.7	10.0	7.4	30.0
1,3,5-Trimethylbenzene	Lin1		2.549		10.6	10.0	5.5	30.0
4-Chlorotoluene	Ave	0.7133	0.8011		11.2	10.0	12.3	30.0
tert-Butylbenzene	Lin1		2.296		9.79	10.0	-2.1	30.0
1,2,4-Trimethylbenzene	Lin1		2.673		10.4	10.0	4.2	30.0
sec-Butylbenzene	Lin1		3.079		10.3	10.0	3.4	30.0
4-Isopropyltoluene	Lin1		2.735		10.4	10.0	3.7	30.0
1,3-Dichlorobenzene	Ave	1.567	1.616		10.3	10.0	3.2	30.0
1,4-Dichlorobenzene	Ave	1.689	1.641		9.72	10.0	-2.8	30.0
n-Butylbenzene	Lin1		0.6230		10.0	10.0	0.2	30.0
1,2-Dichlorobenzene	Ave	1.393	1.412		10.1	10.0	1.4	30.0
1,2-Dibromo-3-Chloropropane	Lin1		0.0769		7.64	10.0	-23.6	50.0
1,3,5-Trichlorobenzene	Ave	1.068	1.151		10.8	10.0	7.8	30.0
1,2,4-Trichlorobenzene	Lin1		0.9360		9.13	10.0	-8.7	40.0
Hexachlorobutadiene	Ave	0.4254	0.4559		10.7	10.0	7.2	40.0
Naphthalene	Lin1		1.336		8.12	10.0	-18.8	40.0
1,2,3-Trichlorobenzene	Ave	0.7421	0.7925		10.7	10.0	6.8	40.0
Dibromofluoromethane (Surr)	Ave	0.2829	0.2806		14.9	15.0	-0.8	
1,2-Dichloroethane-d4 (Surr)	Ave	0.2769	0.2618		14.2	15.0	-5.5	
Trifluorotoluene (Surr)	Ave	1.137	1.121		9.85	10.0	-1.5	
Toluene-d8 (Surr)	Ave	1.193	1.238		15.6	15.0	3.7	

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Lab Sample ID: CCVIS 580-168393/3 Calibration Date: 08/29/2014 07:37

Instrument ID: SEA015 Calib Start Date: 08/26/2014 16:18

GC Column: ZB-624short ID: 0.18(mm) Calib End Date: 08/26/2014 20:00

Lab File ID: I0344217.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
4-Bromofluorobenzene (Surr)	Ave	0.4430	0.4457		15.1	15.0	0.6	

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 580-168317/7

Matrix: Water | Lab File ID: I0344190.D

Analysis Method: 8260B | Date Collected:

Sample wt/vol: 10(mL) | Date Analyzed: 08/28/2014 12:48

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168317 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	ND		0.10	0.10
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	ND		0.10	0.10
79-01-6	Trichloroethene	ND		0.10	0.10
75-01-4	Vinyl chloride	ND		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	97		75-120
98-08-8	Trifluorotoluene (Surr)	86		80-127
2037-26-5	Toluene-d8 (Surr)	100		75-125
1868-53-7	Dibromofluoromethane (Surr)	98		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		70-128

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 580-168393/7

Matrix: Water | Lab File ID: I0344220.D

Analysis Method: 8260B | Date Collected:

Sample wt/vol: 10(mL) | Date Analyzed: 08/29/2014 09:28

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168393 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	ND		0.10	0.10
75-35-4	1,1-Dichloroethene	ND		0.10	0.10
127-18-4	Tetrachloroethene	ND		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	ND		0.10	0.10
79-01-6	Trichloroethene	ND		0.10	0.10
75-01-4	Vinyl chloride	ND		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	98		75-120
98-08-8	Trifluorotoluene (Surr)	80		80-127
2037-26-5	Toluene-d8 (Surr)	101		75-125
1868-53-7	Dibromofluoromethane (Surr)	99		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		70-128

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 580-168317/8

Matrix: Water | Lab File ID: I0344191.D

Analysis Method: 8260B | Date Collected:

Sample wt/vol: 10(mL) | Date Analyzed: 08/28/2014 13:12

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168317 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	5.17		0.10	0.10
75-35-4	1,1-Dichloroethene	5.19		0.10	0.10
127-18-4	Tetrachloroethene	5.07		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	5.40		0.10	0.10
79-01-6	Trichloroethene	5.21		0.10	0.10
75-01-4	Vinyl chloride	5.31		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	104		75-120
98-08-8	Trifluorotoluene (Surr)	91		80-127
2037-26-5	Toluene-d8 (Surr)	103		75-125
1868-53-7	Dibromofluoromethane (Surr)	100		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		70-128

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 580-168393/8

Matrix: Water | Lab File ID: I0344221.D

Analysis Method: 8260B | Date Collected:

Sample wt/vol: 10(mL) | Date Analyzed: 08/29/2014 09:52

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168393 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	5.59		0.10	0.10
75-35-4	1,1-Dichloroethene	5.55		0.10	0.10
127-18-4	Tetrachloroethene	3.92		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	5.65		0.10	0.10
79-01-6	Trichloroethene	5.37		0.10	0.10
75-01-4	Vinyl chloride	5.76		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	102		75-120
98-08-8	Trifluorotoluene (Surr)	101		80-127
2037-26-5	Toluene-d8 (Surr)	103		75-125
1868-53-7	Dibromofluoromethane (Surr)	104		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		70-128

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 580-168317/9

Matrix: Water | Lab File ID: I0344192.D

Analysis Method: 8260B | Date Collected:

Sample wt/vol: 10(mL) | Date Analyzed: 08/28/2014 13:36

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168317 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	5.37		0.10	0.10
75-35-4	1,1-Dichloroethene	5.21		0.10	0.10
127-18-4	Tetrachloroethene	5.28		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	5.45		0.10	0.10
79-01-6	Trichloroethene	5.27		0.10	0.10
75-01-4	Vinyl chloride	5.51		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	102		75-120
98-08-8	Trifluorotoluene (Surr)	96		80-127
2037-26-5	Toluene-d8 (Surr)	102		75-125
1868-53-7	Dibromofluoromethane (Surr)	102		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	96		70-128

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 580-168393/9

Matrix: Water | Lab File ID: I0344222.D

Analysis Method: 8260B | Date Collected:

Sample wt/vol: 10(mL) | Date Analyzed: 08/29/2014 10:16

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168393 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	5.69		0.10	0.10
75-35-4	1,1-Dichloroethene	5.57		0.10	0.10
127-18-4	Tetrachloroethene	4.32		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	5.50		0.10	0.10
79-01-6	Trichloroethene	5.24		0.10	0.10
75-01-4	Vinyl chloride	5.56		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	104		75-120
98-08-8	Trifluorotoluene (Surr)	100		80-127
2037-26-5	Toluene-d8 (Surr)	100		75-125
1868-53-7	Dibromofluoromethane (Surr)	103		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		70-128

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: MW18-140825-W MS | Lab Sample ID: 580-45117-4 MS

Matrix: Water | Lab File ID: I0344193.D

Analysis Method: 8260B | Date Collected: 08/25/2014 15:50

Sample wt/vol: 10(mL) | Date Analyzed: 08/28/2014 14:01

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168317 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	5.71		0.10	0.10
75-35-4	1,1-Dichloroethene	5.08		0.10	0.10
127-18-4	Tetrachloroethene	3.30		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	5.67		0.10	0.10
79-01-6	Trichloroethene	5.76		0.10	0.10
75-01-4	Vinyl chloride	8.18		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	105		75-120
98-08-8	Trifluorotoluene (Surr)	102		80-127
2037-26-5	Toluene-d8 (Surr)	103		75-125
1868-53-7	Dibromofluoromethane (Surr)	98		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	96		70-128

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-45117-1

SDG No.:

Client Sample ID: MW18-140825-W MSD | Lab Sample ID: 580-45117-4 MSD

Matrix: Water | Lab File ID: I0344194.D

Analysis Method: 8260B | Date Collected: 08/25/2014 15:50

Sample wt/vol: 10(mL) | Date Analyzed: 08/28/2014 14:25

Soil Aliquot Vol: | Dilution Factor: 1

Soil Extract Vol.: | GC Column: ZB-624short ID: 0.18(mm)

% Moisture: | Level: (low/med) Low

Analysis Batch No.: 168317 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
156-59-2	cis-1,2-Dichloroethene	5.52		0.10	0.10
75-35-4	1,1-Dichloroethene	5.15		0.10	0.10
127-18-4	Tetrachloroethene	3.23		0.10	0.10
156-60-5	trans-1,2-Dichloroethene	5.65		0.10	0.10
79-01-6	Trichloroethene	5.57		0.10	0.10
75-01-4	Vinyl chloride	7.91		0.020	0.020

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	99		75-120
98-08-8	Trifluorotoluene (Surr)	99		80-127
2037-26-5	Toluene-d8 (Surr)	102		75-125
1868-53-7	Dibromofluoromethane (Surr)	98		85-115
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		70-128

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Instrument ID: SEA015 Start Date: 08/26/2014 15:29

Analysis Batch Number: 168147 End Date: 08/26/2014 20:48

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RINSE 580-168147/1 BFB		08/26/2014 15:29	1		ZB-624short 0.18(mm)
BFB 580-168147/2		08/26/2014 15:54	1	I0344142.D	ZB-624short 0.18(mm)
STD00002 580-168147/3 IC		08/26/2014 16:18	1	I0344143.D	ZB-624short 0.18(mm)
STD0001 580-168147/4 IC		08/26/2014 16:43	1	I0344144.D	ZB-624short 0.18(mm)
STD0002 580-168147/5 IC		08/26/2014 17:08	1	I0344145.D	ZB-624short 0.18(mm)
STD0004 580-168147/6 IC		08/26/2014 17:32	1	I0344146.D	ZB-624short 0.18(mm)
STD001 580-168147/7 IC		08/26/2014 17:57	1	I0344147.D	ZB-624short 0.18(mm)
STD005 580-168147/8 IC		08/26/2014 18:22	1	I0344148.D	ZB-624short 0.18(mm)
ICIS 580-168147/9		08/26/2014 18:46	1	I0344149.D	ZB-624short 0.18(mm)
STD025 580-168147/10 IC		08/26/2014 19:11	1	I0344150.D	ZB-624short 0.18(mm)
STD050 580-168147/11 IC		08/26/2014 19:36	1	I0344151.D	ZB-624short 0.18(mm)
STD080 580-168147/12 IC		08/26/2014 20:00	1	I0344152.D	ZB-624short 0.18(mm)
ZZZZZ		08/26/2014 20:24	1		ZB-624short 0.18(mm)
ICV 580-168147/14		08/26/2014 20:48	1	I0344154.D	ZB-624short 0.18(mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Instrument ID: SEA015 Start Date: 08/28/2014 10:21

Analysis Batch Number: 168317 End Date: 08/28/2014 20:58

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RINSE 580-168317/1 BFB		08/28/2014 10:21	1		ZB-624short 0.18(mm)
BFB 580-168317/2		08/28/2014 10:46	1	I0344185.D	ZB-624short 0.18(mm)
CCVIS 580-168317/3		08/28/2014 11:10	1	I0344186.D	ZB-624short 0.18(mm)
CCVL 580-168317/4		08/28/2014 11:34	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 11:59	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 12:23	1		ZB-624short 0.18(mm)
MB 580-168317/7		08/28/2014 12:48	1	I0344190.D	ZB-624short 0.18(mm)
LCS 580-168317/8		08/28/2014 13:12	1	I0344191.D	ZB-624short 0.18(mm)
LCSD 580-168317/9		08/28/2014 13:36	1	I0344192.D	ZB-624short 0.18(mm)
580-45117-4 MS	MW18-140825-W MS	08/28/2014 14:01	1	I0344193.D	ZB-624short 0.18(mm)
580-45117-4 MSD	MW18-140825-W MSD	08/28/2014 14:25	1	I0344194.D	ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 14:50	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 15:15	1		ZB-624short 0.18(mm)
580-45117-5	Trip Blank	08/28/2014 15:39	1	I0344197.D	ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 16:04	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 16:53	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 17:18	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 17:43	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 18:07	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 18:32	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 18:57	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 19:21	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 19:45	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 20:10	1		ZB-624short 0.18(mm)
ZZZZZ		08/28/2014 20:34	1		ZB-624short 0.18(mm)
580-45117-1	DUP01-140825-W	08/28/2014 20:58	1	I0344210.D	ZB-624short 0.18(mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Instrument ID: SEA015 Start Date: 08/29/2014 07:37

Analysis Batch Number: 168393 End Date: 08/29/2014 20:41

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 580-168393/2		08/29/2014 07:37	1	I0344217bfb.D	ZB-624short 0.18(mm)
CCVIS 580-168393/3		08/29/2014 07:37	1	I0344217.D	ZB-624short 0.18(mm)
CCVL 580-168393/4		08/29/2014 08:01	1		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 08:25	1		ZB-624short 0.18(mm)
MB 580-168393/7		08/29/2014 09:28	1	I0344220.D	ZB-624short 0.18(mm)
LCS 580-168393/8		08/29/2014 09:52	1	I0344221.D	ZB-624short 0.18(mm)
LCSD 580-168393/9		08/29/2014 10:16	1	I0344222.D	ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 10:41	1		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 11:05	1		ZB-624short 0.18(mm)
580-45117-1 RA	DUP01-140825-W RA	08/29/2014 11:41	1	I0344225.D	ZB-624short 0.18(mm)
580-45117-2	MW16-140825-W	08/29/2014 12:05	1	I0344226.D	ZB-624short 0.18(mm)
580-45117-3	MW03-140825-W	08/29/2014 12:29	1	I0344227.D	ZB-624short 0.18(mm)
580-45117-4	MW18-140825-W	08/29/2014 13:00	1	I0344228.D	ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 13:24	100		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 13:48	50		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 14:13	10		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 14:37	10		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 15:01	10		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 15:25	10		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 15:50	10		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 16:39	1		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 17:03	1		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 17:27	1		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 17:51	1		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 18:16	1		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 19:04	1		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 19:28	500		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 19:52	10		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 20:17	1		ZB-624short 0.18(mm)
ZZZZZ		08/29/2014 20:41	1		ZB-624short 0.18(mm)

GENERAL CHEMISTRY

COVER PAGE
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job Number: 580-45117-1

SDG No.:

Project: 318 State AVE NE (WA)

Client Sample ID	Lab Sample ID
DUP01-140825-W	580-45117-1
MW16-140825-W	580-45117-2
MW03-140825-W	580-45117-3
MW18-140825-W	580-45117-4

Comments:

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: DUP01-140825-W
Lab Sample ID: 580-45117-1
Lab Name: TestAmerica Seattle
Job No.: 580-45117-1
SDG ID.:
Matrix: Water
Date Sampled: 08/25/2014 12:00
Reporting Basis: WET
Date Received: 08/25/2014 17:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	3.0	1.2		mg/L			1	300.0

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: MW16-140825-W
Lab Sample ID: 580-45117-2
Lab Name: TestAmerica Seattle
Job No.: 580-45117-1
SDG ID.:
Matrix: Water
Date Sampled: 08/25/2014 13:25
Reporting Basis: WET
Date Received: 08/25/2014 17:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	3.1	1.2		mg/L			1	300.0

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: MW03-140825-W
Lab Sample ID: 580-45117-3
Lab Name: TestAmerica Seattle
Job No.: 580-45117-1
SDG ID.:
Matrix: Water
Date Sampled: 08/25/2014 14:40
Reporting Basis: WET
Date Received: 08/25/2014 17:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	ND	1.2		mg/L			1	300.0

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: MW18-140825-W
Lab Sample ID: 580-45117-4
Lab Name: TestAmerica Seattle
Job No.: 580-45117-1
SDG ID.:
Matrix: Water
Date Sampled: 08/25/2014 15:50
Reporting Basis: WET
Date Received: 08/25/2014 17:20

CAS No.	Analyte	Result	RL		Units	C	Q	DIL	Method
14808-79-8	Sulfate	ND	1.2		mg/L			1	300.0

2-IN
CALIBRATION QUALITY CONTROL
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Analyst: JLS Batch Start Date: 08/29/2014

Reporting Units: mg/L Analytical Batch No.: 168473

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
16	CCV	11:50	Sulfate	37.3	37.5	99	90-110		TAC044 CCV_00004
17	CCB	12:05	Sulfate	ND					

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM II-IN

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 168473	Date: 08/29/2014 08:00						
300.0	MB 580-168473/3	Sulfate	ND		mg/L	1.2	1

5-IN
MATRIX SPIKE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 168473		Date: 08/29/2014 10:38									
300.0	580-45117-4	Sulfate	ND		mg/L						
300.0	580-45117-4 MS	Sulfate	12.1		mg/L	12.0	101	90-110			

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM V-IN

5-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 168473 Date: 08/29/2014 10:53											
300.0	580-45117-4 MSD	Sulfate	12.2		mg/L	12.0	102	90-110	1	15	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM V-IN

6-IN
DUPLICATE
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Matrix: Water

Method	Client Sample ID	Lab Sample ID	Analyte	Result	Unit	RPD	RPD Limit	Qual
Batch ID: 168473 Date: 08/29/2014 10:24								
300.0	MW18-140825-W	580-45117-4	Sulfate	ND	mg/L			
300.0	MW18-140825-W	580-45117-4 DU	Sulfate	ND	mg/L	NC	10	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VI-IN

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 168473	Date: 08/29/2014 08:14										
						LCS Source: TAC044 LCS_00003					
300.0	LCS 580-168473/4	Sulfate	11.8		mg/L	12.0	98	90-110	0	15	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

7A-IN
LAB CONTROL SAMPLE DUPLICATE
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 168473	Date: 08/29/2014 08:28										
						LCSD Source: TAC044 LCS_00003					
300.0	LCSD 580-168473/5	Sulfate	11.8		mg/L	12.0	98	90-110	0	15	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job Number: 580-45117-1

SDG Number:

Matrix: Water Instrument ID: TAC044

Method: 300.0 RL Date: 09/24/2009 08:59

Analyte	Wavelength/ Mass	RL (mg/L)	
Sulfate		1.2	

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job Number: 580-45117-1

SDG Number:

Matrix: Water Instrument ID: TAC044

Method: 300.0 XMDL Date: 08/24/2009 13:55

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
Sulfate		1.2	0.4

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Instrument ID: TAC044 Method: 300.0

Start Date: 08/29/2014 08:00 End Date: 08/30/2014 14:10

Lab Sample ID	D/F	Type	Time	Analytes																			
				SO4																			
MB 580-168473/3	1	T	08:00	X																			
LCS 580-168473/4	1	T	08:14	X																			
LCSD 580-168473/5	1	T	08:28	X																			
580-45117-1	1	T	09:26	X																			
580-45117-2	1	T	09:41	X																			
580-45117-3	1	T	09:55	X																			
580-45117-4	1	T	10:09	X																			
580-45117-4 DU	1	T	10:24	X																			
580-45117-4 MS	1	T	10:38	X																			
580-45117-4 MSD	1	T	10:53	X																			
ZZZZZZ			11:07																				
ZZZZZZ			11:21																				
ZZZZZZ			11:36																				
CCV 580-168473/16	1		11:50	X																			
CCB 580-168473/17	1		12:05	X																			
ZZZZZZ			12:19																				
ZZZZZZ			12:34																				
ZZZZZZ			13:02																				
ZZZZZZ			13:17																				
ZZZZZZ			14:00																				
ZZZZZZ			14:14																				
CCV 580-168473/22			14:29																				
CCB 580-168473/23			14:43																				
ZZZZZZ			08:49																				
ZZZZZZ			09:04																				
ZZZZZZ			09:18																				
ZZZZZZ			10:10																				
ZZZZZZ			10:24																				
ZZZZZZ			10:38																				
ZZZZZZ			10:53																				
ZZZZZZ			11:07																				
ZZZZZZ			11:22																				
ZZZZZZ			11:36																				
ZZZZZZ			11:50																				
ZZZZZZ			12:05																				
ZZZZZZ			12:19																				
ZZZZZZ			12:58																				
ZZZZZZ			13:12																				
ZZZZZZ			13:26																				
ZZZZZZ			13:41																				
ZZZZZZ			13:55																				
ZZZZZZ			14:10																				

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Instrument ID: TAC044 Method: 300.0

Start Date: 08/29/2014 08:00 End Date: 08/30/2014 14:10

Prep Types
T = Total/NA

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Seattle Job No.: 580-45117-1

SDG No.:

Batch Number: 168473 Batch Start Date: 08/29/14 08:00 Batch Analyst: Shewell, Jesse L

Batch Method: 300.0 Batch End Date: 08/29/14 14:45

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	IC-Custom-Std 00003	TAC044 CCV 00004	TAC044 LCS 00003	
MB 580-168473/3		300.0		5 mL	5 mL				
LCS 580-168473/4		300.0		5 mL	5 mL			5 mL	
LCSD 580-168473/5		300.0		5 mL	5 mL			5 mL	
580-45117-D-1	DUP01-140825-W	300.0	T	5 mL	5 mL				
580-45117-D-2	MW16-140825-W	300.0	T	5 mL	5 mL				
580-45117-D-3	MW03-140825-W	300.0	T	5 mL	5 mL				
580-45117-D-4	MW18-140825-W	300.0	T	5 mL	5 mL				
580-45117-D-4 DU	MW18-140825-W	300.0	T	5 mL	5 mL				
580-45117-D-4 MS	MW18-140825-W	300.0	T	5 mL	5 mL	0.05 mL			
580-45117-D-4 MSD	MW18-140825-W	300.0	T	5 mL	5 mL	0.05 mL			
CCV 580-168473/16		300.0		5 mL	5 mL		5 mL		
CCB 580-168473/17		300.0		5 mL	5 mL				

Batch Notes	
Filter Lot #	R35A17902

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Shipping and Receiving Documents

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

☐ Rush
☐ Short Hold

Chain of Custody Record

09/09/2014

Client	Client Contact	Date	Chain of Custody Number
GEI	Iain Wingard	8/25/14	25283
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page ____ of ____**
1101 S. Fawcett #200	253-383-4940	45117	
City / State / Zip Code	**Sampler**	**Lab Contact**	**Analysis (Attach list if more space is needed)**
Tacoma / WA / 98402	PDR	Walissa Armstrong	Sulfate / VOCs 8260B
Project Name and Location (State)	**Billing Contact**		
318 State Ave NE (WA)			
Contract/Purchase Order/Quote No.			

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Sulfate	VOCs 8260B	Special Instructions/ Conditions of Receipt
-1 DUP01-140825-W	8/25	1200		X			1			3			X	X	Reporting limits
-2 MW16-140825-W	8/25	1325		X			1			3			X	X	Analyte list, QA/QC
-3 MW03-140825-W		1440		X			1			3			X	X	to be achieved
TB 8/26/14 -4 MW18-140825-W		1600		X			1			3			X	X	See Table B-1
-4 -5 MW18-140825-MS		1555		X			1			3			X	X	thru B-4 of
4/6 MW18-140825-MSD		1555		X			1			3			X	X	compliance monitoring
-5 -7 TRIP Blank				X						3				X	plan

580-45117 Chain of Custody

Cooler TB Dig/IR cor 5.6 unc 5.9 A2
Cooler Dsc Lg Red/Wht @ Lab
Wet/Packs Packing bubb
Client drop

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Cooler	Possible Hazard Identification	Sample Disposal
☐ Yes ☐ No Cooler Temp: ____	☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown	☐ Return To Client ☐ Disposal By ☐ Archive For ____ Months (are retained longer than 1 month)

Turn Around Time Required (business days)
☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☐ Other ____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By Sign/Print: Paul Robicheau	8/25	1720	1. Received By Sign/Print: Tom Blankinship	8/25/14	1720
2. Relinquished By Sign/Print			2. Received By Sign/Print		
3. Relinquished By Sign/Print			3. Received By Sign/Print		

Comments

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (0210)

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 580-45117-1

Login Number: 45117

List Source: TestAmerica Seattle

List Number: 1

Creator: Blankinship, Tom X

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	The MS & MSD samples have different times than the parent; logged in w/earliest.
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-45117-1
Client Project/Site: 318 State AVE NE (WA)

For:
GeoEngineers Inc
1101 Fawcett, Suite 200
Tacoma, Washington 98402

Attn: Mr. Iain Wingard

Authorized for release by:
9/9/2014 3:42:00 PM

Melissa Armstrong, Project Manager II
(253)248-4975
melissa.armstrong@testamericainc.com

Table of Contents

Job ID: 580-45117-1

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE

Client: GeoEngineers Inc
Project: 318 State AVE NE (WA)
Report Number: 580-45117-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 8/25/2014 5:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.9º C.

Except:
The container labels and Chain of Custody (COC) for the following samples MW18-140825-W (580-45117-4 MS) and MW18-140825-W (580-45117-4 MSD) have different times than their parent sample MW18-140825-W (580-45117-4). All samples were logged in with the parent sample time of 15:50.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

VOLATILE ORGANIC COMPOUNDS (GC-MS) LOW LEVEL
Samples DUP01-140825-W (580-45117-1), MW16-140825-W (580-45117-2), MW03-140825-W (580-45117-3), MW18-140825-W (580-45117-4) and Trip Blank (580-45117-5) were analyzed for volatile organic compounds (GC-MS) low level in accordance with EPA SW-846 8260B. The samples were analyzed on 08/28/2014 and 08/29/2014.

Sample DUP01-140825-W (580-45117-1) was reanalyzed for cis-1,2-Dichloroethene, Tetrachloroethene and Trichloroethene due to potential carryover from a highly contaminated sample in the original analysis.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS
Samples DUP01-140825-W (580-45117-1), MW16-140825-W (580-45117-2), MW03-140825-W (580-45117-3) and MW18-140825-W (580-45117-4) were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 08/29/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)

TestAmerica Job ID: 580-45117-1

Client Sample ID: DUP01-140825-W
Date Collected: 08/25/14 12:00
Date Received: 08/25/14 17:20

Lab Sample ID: 580-45117-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.10	0.10	ug/L			08/28/14 20:58	1
trans-1,2-Dichloroethene	**0.19**		0.10	0.10	ug/L			08/28/14 20:58	1
Vinyl chloride	**0.51**		0.020	0.020	ug/L			08/28/14 20:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*75 - 120*		*08/28/14 20:58*	*1*
Trifluorotoluene (Surr)	*88*		*80 - 127*		*08/28/14 20:58*	*1*
Toluene-d8 (Surr)	*102*		*75 - 125*		*08/28/14 20:58*	*1*
Dibromofluoromethane (Surr)	*96*		*85 - 115*		*08/28/14 20:58*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 128*		*08/28/14 20:58*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - RA

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**0.25**		0.10	0.10	ug/L			08/29/14 11:41	1
Tetrachloroethene	ND		0.10	0.10	ug/L			08/29/14 11:41	1
Trichloroethene	**0.36**		0.10	0.10	ug/L			08/29/14 11:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*75 - 120*		*08/29/14 11:41*	*1*
Trifluorotoluene (Surr)	*93*		*80 - 127*		*08/29/14 11:41*	*1*
Toluene-d8 (Surr)	*100*		*75 - 125*		*08/29/14 11:41*	*1*
Dibromofluoromethane (Surr)	*96*		*85 - 115*		*08/29/14 11:41*	*1*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 128*		*08/29/14 11:41*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**3.0**		1.2	1.2	mg/L			08/29/14 09:26	1

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)

TestAmerica Job ID: 580-45117-1

Client Sample ID: MW16-140825-W
Date Collected: 08/25/14 13:25
Date Received: 08/25/14 17:20

Lab Sample ID: 580-45117-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**0.25**		0.10	0.10	ug/L			08/29/14 12:05	1
1,1-Dichloroethene	ND		0.10	0.10	ug/L			08/29/14 12:05	1
Tetrachloroethene	ND		0.10	0.10	ug/L			08/29/14 12:05	1
trans-1,2-Dichloroethene	**0.18**		0.10	0.10	ug/L			08/29/14 12:05	1
Trichloroethene	**0.37**		0.10	0.10	ug/L			08/29/14 12:05	1
Vinyl chloride	**0.52**		0.020	0.020	ug/L			08/29/14 12:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*75 - 120*		*08/29/14 12:05*	*1*
Trifluorotoluene (Surr)	*93*		*80 - 127*		*08/29/14 12:05*	*1*
Toluene-d8 (Surr)	*101*		*75 - 125*		*08/29/14 12:05*	*1*
Dibromofluoromethane (Surr)	*99*		*85 - 115*		*08/29/14 12:05*	*1*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 128*		*08/29/14 12:05*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**3.1**		1.2	1.2	mg/L			08/29/14 09:41	1

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)

TestAmerica Job ID: 580-45117-1

Client Sample ID: MW03-140825-W
Date Collected: 08/25/14 14:40
Date Received: 08/25/14 17:20

Lab Sample ID: 580-45117-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**0.35**		0.10	0.10	ug/L			08/29/14 12:29	1
1,1-Dichloroethene	ND		0.10	0.10	ug/L			08/29/14 12:29	1
Tetrachloroethene	ND		0.10	0.10	ug/L			08/29/14 12:29	1
trans-1,2-Dichloroethene	**0.36**		0.10	0.10	ug/L			08/29/14 12:29	1
Trichloroethene	ND		0.10	0.10	ug/L			08/29/14 12:29	1
Vinyl chloride	**0.25**		0.020	0.020	ug/L			08/29/14 12:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*75 - 120*		*08/29/14 12:29*	*1*
Trifluorotoluene (Surr)	*90*		*80 - 127*		*08/29/14 12:29*	*1*
Toluene-d8 (Surr)	*100*		*75 - 125*		*08/29/14 12:29*	*1*
Dibromofluoromethane (Surr)	*96*		*85 - 115*		*08/29/14 12:29*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 128*		*08/29/14 12:29*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		1.2	1.2	mg/L			08/29/14 09:55	1

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)

TestAmerica Job ID: 580-45117-1

Client Sample ID: MW18-140825-W
Date Collected: 08/25/14 15:50
Date Received: 08/25/14 17:20

Lab Sample ID: 580-45117-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**0.51**		0.10	0.10	ug/L			08/29/14 13:00	1
1,1-Dichloroethene	ND		0.10	0.10	ug/L			08/29/14 13:00	1
Tetrachloroethene	ND		0.10	0.10	ug/L			08/29/14 13:00	1
trans-1,2-Dichloroethene	**0.43**		0.10	0.10	ug/L			08/29/14 13:00	1
Trichloroethene	**0.48**		0.10	0.10	ug/L			08/29/14 13:00	1
Vinyl chloride	**2.7**		0.020	0.020	ug/L			08/29/14 13:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*75 - 120*		*08/29/14 13:00*	*1*
Trifluorotoluene (Surr)	*92*		*80 - 127*		*08/29/14 13:00*	*1*
Toluene-d8 (Surr)	*100*		*75 - 125*		*08/29/14 13:00*	*1*
Dibromofluoromethane (Surr)	*95*		*85 - 115*		*08/29/14 13:00*	*1*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 128*		*08/29/14 13:00*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		1.2	1.2	mg/L			08/29/14 10:09	1

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)

TestAmerica Job ID: 580-45117-1

Client Sample ID: Trip Blank
Date Collected: 08/25/14 00:00
Date Received: 08/25/14 17:20

Lab Sample ID: 580-45117-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		0.10	0.10	ug/L			08/28/14 15:39	1
1,1-Dichloroethene	ND		0.10	0.10	ug/L			08/28/14 15:39	1
Tetrachloroethene	ND		0.10	0.10	ug/L			08/28/14 15:39	1
trans-1,2-Dichloroethene	ND		0.10	0.10	ug/L			08/28/14 15:39	1
Trichloroethene	ND		0.10	0.10	ug/L			08/28/14 15:39	1
Vinyl chloride	ND		0.020	0.020	ug/L			08/28/14 15:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*75 - 120*		*08/28/14 15:39*	*1*
Trifluorotoluene (Surr)	*89*		*80 - 127*		*08/28/14 15:39*	*1*
Toluene-d8 (Surr)	*102*		*75 - 125*		*08/28/14 15:39*	*1*
Dibromofluoromethane (Surr)	*96*		*85 - 115*		*08/28/14 15:39*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 128*		*08/28/14 15:39*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-168317/7
Matrix: Water
Analysis Batch: 168317

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		0.10	0.10	ug/L			08/28/14 12:48	1
1,1-Dichloroethene	ND		0.10	0.10	ug/L			08/28/14 12:48	1
Tetrachloroethene	ND		0.10	0.10	ug/L			08/28/14 12:48	1
trans-1,2-Dichloroethene	ND		0.10	0.10	ug/L			08/28/14 12:48	1
Trichloroethene	ND		0.10	0.10	ug/L			08/28/14 12:48	1
Vinyl chloride	ND		0.020	0.020	ug/L			08/28/14 12:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*75 - 120*		*08/28/14 12:48*	*1*
Trifluorotoluene (Surr)	*86*		*80 - 127*		*08/28/14 12:48*	*1*
Toluene-d8 (Surr)	*100*		*75 - 125*		*08/28/14 12:48*	*1*
Dibromofluoromethane (Surr)	*98*		*85 - 115*		*08/28/14 12:48*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 128*		*08/28/14 12:48*	*1*

Lab Sample ID: LCS 580-168317/8
Matrix: Water
Analysis Batch: 168317

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
cis-1,2-Dichloroethene			5.00	5.17		ug/L		103	80 - 130		
1,1-Dichloroethene			5.00	5.19		ug/L		104	70 - 150		
Tetrachloroethene			5.00	5.07		ug/L		101	40 - 180		
trans-1,2-Dichloroethene			5.00	5.40		ug/L		108	80 - 140		
Trichloroethene			5.00	5.21		ug/L		104	80 - 130		
Vinyl chloride			5.00	5.31		ug/L		106	65 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*104*		*75 - 120*
Trifluorotoluene (Surr)	*91*		*80 - 127*
Toluene-d8 (Surr)	*103*		*75 - 125*
Dibromofluoromethane (Surr)	*100*		*85 - 115*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 128*

Lab Sample ID: LCSD 580-168317/9
Matrix: Water
Analysis Batch: 168317

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene			5.00	5.37		ug/L		107	80 - 130	4	20
1,1-Dichloroethene			5.00	5.21		ug/L		104	70 - 150	0	20
Tetrachloroethene			5.00	5.28		ug/L		106	40 - 180	4	20
trans-1,2-Dichloroethene			5.00	5.45		ug/L		109	80 - 140	1	20
Trichloroethene			5.00	5.27		ug/L		105	80 - 130	1	20
Vinyl chloride			5.00	5.51		ug/L		110	65 - 140	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*75 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 580-168317/9
Matrix: Water
Analysis Batch: 168317

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Trifluorotoluene (Surr)	*96*		*80 - 127*
Toluene-d8 (Surr)	*102*		*75 - 125*
Dibromofluoromethane (Surr)	*102*		*85 - 115*
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 128*

Lab Sample ID: 580-45117-4 MS
Matrix: Water
Analysis Batch: 168317

Client Sample ID: MW18-140825-W
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	0.51		5.00	5.71		ug/L		104	71 - 144
1,1-Dichloroethene	ND		5.00	5.08		ug/L		102	78 - 151
Tetrachloroethene	ND		5.00	3.30		ug/L		66	64 - 161
trans-1,2-Dichloroethene	0.43		5.00	5.67		ug/L		105	73 - 135
Trichloroethene	0.48		5.00	5.76		ug/L		106	79 - 131
Vinyl chloride	2.7		5.00	8.18		ug/L		110	47 - 160

Surrogate	MS %Recovery	MS Qualifier	Limits
4-Bromofluorobenzene (Surr)	*105*		*75 - 120*
Trifluorotoluene (Surr)	*102*		*80 - 127*
Toluene-d8 (Surr)	*103*		*75 - 125*
Dibromofluoromethane (Surr)	*98*		*85 - 115*
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 128*

Lab Sample ID: 580-45117-4 MSD
Matrix: Water
Analysis Batch: 168317

Client Sample ID: MW18-140825-W
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	0.51		5.00	5.52		ug/L		100	71 - 144	3	20
1,1-Dichloroethene	ND		5.00	5.15		ug/L		103	78 - 151	1	30
Tetrachloroethene	ND		5.00	3.23		ug/L		65	64 - 161	2	20
trans-1,2-Dichloroethene	0.43		5.00	5.65		ug/L		104	73 - 135	0	20
Trichloroethene	0.48		5.00	5.57		ug/L		102	79 - 131	3	30
Vinyl chloride	2.7		5.00	7.91		ug/L		105	47 - 160	3	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*99*		*75 - 120*
Trifluorotoluene (Surr)	*99*		*80 - 127*
Toluene-d8 (Surr)	*102*		*75 - 125*
Dibromofluoromethane (Surr)	*98*		*85 - 115*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 128*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 580-168393/7
Matrix: Water
Analysis Batch: 168393

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	ND		0.10	0.10	ug/L			08/29/14 09:28	1
1,1-Dichloroethene	ND		0.10	0.10	ug/L			08/29/14 09:28	1
Tetrachloroethene	ND		0.10	0.10	ug/L			08/29/14 09:28	1
trans-1,2-Dichloroethene	ND		0.10	0.10	ug/L			08/29/14 09:28	1
Trichloroethene	ND		0.10	0.10	ug/L			08/29/14 09:28	1
Vinyl chloride	ND		0.020	0.020	ug/L			08/29/14 09:28	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*75 - 120*		*08/29/14 09:28*	*1*
Trifluorotoluene (Surr)	*80*		*80 - 127*		*08/29/14 09:28*	*1*
Toluene-d8 (Surr)	*101*		*75 - 125*		*08/29/14 09:28*	*1*
Dibromofluoromethane (Surr)	*99*		*85 - 115*		*08/29/14 09:28*	*1*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 128*		*08/29/14 09:28*	*1*

Lab Sample ID: LCS 580-168393/8
Matrix: Water
Analysis Batch: 168393

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
cis-1,2-Dichloroethene			5.00	5.59		ug/L		112	80 - 130		
1,1-Dichloroethene			5.00	5.55		ug/L		111	70 - 150		
Tetrachloroethene			5.00	3.92		ug/L		78	40 - 180		
trans-1,2-Dichloroethene			5.00	5.65		ug/L		113	80 - 140		
Trichloroethene			5.00	5.37		ug/L		107	80 - 130		
Vinyl chloride			5.00	5.76		ug/L		115	65 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*75 - 120*
Trifluorotoluene (Surr)	*101*		*80 - 127*
Toluene-d8 (Surr)	*103*		*75 - 125*
Dibromofluoromethane (Surr)	*104*		*85 - 115*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 128*

Lab Sample ID: LCSD 580-168393/9
Matrix: Water
Analysis Batch: 168393

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene			5.00	5.69		ug/L		114	80 - 130	2	20
1,1-Dichloroethene			5.00	5.57		ug/L		111	70 - 150	0	20
Tetrachloroethene			5.00	4.32		ug/L		86	40 - 180	10	20
trans-1,2-Dichloroethene			5.00	5.50		ug/L		110	80 - 140	3	20
Trichloroethene			5.00	5.24		ug/L		105	80 - 130	2	20
Vinyl chloride			5.00	5.56		ug/L		111	65 - 140	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*104*		*75 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 580-168393/9
Matrix: Water
Analysis Batch: 168393

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Trifluorotoluene (Surr)	*100*		*80 - 127*
Toluene-d8 (Surr)	*100*		*75 - 125*
Dibromofluoromethane (Surr)	*103*		*85 - 115*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 128*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 580-168473/3
Matrix: Water
Analysis Batch: 168473

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		1.2	1.2	mg/L			08/29/14 08:00	1

Lab Sample ID: LCS 580-168473/4
Matrix: Water
Analysis Batch: 168473

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			12.0	11.8		mg/L		98	90 - 110		

Lab Sample ID: LCSD 580-168473/5
Matrix: Water
Analysis Batch: 168473

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate			12.0	11.8		mg/L		98	90 - 110	0	15

Lab Sample ID: 580-45117-4 MS
Matrix: Water
Analysis Batch: 168473

Client Sample ID: MW18-140825-W
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate	ND		12.0	12.1		mg/L		101	90 - 110		

Lab Sample ID: 580-45117-4 MSD
Matrix: Water
Analysis Batch: 168473

Client Sample ID: MW18-140825-W
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	ND		12.0	12.2		mg/L		102	90 - 110	1	15

Lab Sample ID: 580-45117-4 DU
Matrix: Water
Analysis Batch: 168473

Client Sample ID: MW18-140825-W
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Sulfate	ND			ND		mg/L				NC	10

Lab Chronicle

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)

TestAmerica Job ID: 580-45117-1

Client Sample ID: DUP01-140825-W

Lab Sample ID: 580-45117-1

Date Collected: 08/25/14 12:00
Matrix: Water
Date Received: 08/25/14 17:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	168317	08/28/14 20:58	PS1	TAL SEA
Total/NA	Analysis	8260B	RA	1	168393	08/29/14 11:41	YK	TAL SEA
Total/NA	Analysis	300.0		1	168473	08/29/14 09:26	JLS	TAL SEA

Client Sample ID: MW16-140825-W

Lab Sample ID: 580-45117-2

Date Collected: 08/25/14 13:25
Matrix: Water
Date Received: 08/25/14 17:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	168393	08/29/14 12:05	YK	TAL SEA
Total/NA	Analysis	300.0		1	168473	08/29/14 09:41	JLS	TAL SEA

Client Sample ID: MW03-140825-W

Lab Sample ID: 580-45117-3

Date Collected: 08/25/14 14:40
Matrix: Water
Date Received: 08/25/14 17:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	168393	08/29/14 12:29	YK	TAL SEA
Total/NA	Analysis	300.0		1	168473	08/29/14 09:55	JLS	TAL SEA

Client Sample ID: MW18-140825-W

Lab Sample ID: 580-45117-4

Date Collected: 08/25/14 15:50
Matrix: Water
Date Received: 08/25/14 17:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	168393	08/29/14 13:00	YK	TAL SEA
Total/NA	Analysis	300.0		1	168473	08/29/14 10:09	JLS	TAL SEA

Client Sample ID: Trip Blank

Lab Sample ID: 580-45117-5

Date Collected: 08/25/14 00:00
Matrix: Water
Date Received: 08/25/14 17:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	168317	08/28/14 15:39	PS1	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Certification Summary

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)

TestAmerica Job ID: 580-45117-1

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C553	02-17-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
8260B		Water	1,1-Dichloroethene
8260B		Water	cis-1,2-Dichloroethene
8260B		Water	Tetrachloroethene
8260B		Water	trans-1,2-Dichloroethene
8260B		Water	Trichloroethene
8260B		Water	Vinyl chloride

Sample Summary

Client: GeoEngineers Inc
Project/Site: 318 State AVE NE (WA)

TestAmerica Job ID: 580-45117-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-45117-1	DUP01-140825-W	Water	08/25/14 12:00	08/25/14 17:20
580-45117-2	MW16-140825-W	Water	08/25/14 13:25	08/25/14 17:20
580-45117-3	MW03-140825-W	Water	08/25/14 14:40	08/25/14 17:20
580-45117-4	MW18-140825-W	Water	08/25/14 15:50	08/25/14 17:20
580-45117-5	Trip Blank	Water	08/25/14 00:00	08/25/14 17:20

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

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www.testamericainc.com

☐ Rush
☐ Short Hold

Chain of Custody Record

9/9/2014

Client	Client Contact	Date	Chain of Custody Number
GEI	Iain Wingard	8/25/14	25283
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page ____ of ____**
1101 S. Fawcett #200	253-383-4940	45117	
City	**State / Zip Code**	**Sampler**	**Lab Contact**
Tacoma	WA / 98402	PDP	Walissa Armstrong
Project Name and Location (State)	**Billing Contact**		
318 State Ave NE (WA)			
Contract/Purchase Order/Quote No.			

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: Sulfate	VOCs 8260B	Special Instructions/ Conditions of Receipt
-1 DUP01-140825-W	8/25	1200		X			1			3			X	X	Reporting limits
-2 MW16-140825-W	8/25	1325		X			1			3			X	X	Analyte list, QA/QC
-3 MW03-140825-W		1440		X			1			3			X	X	to be achieved
TB 8/26/14 -4 MW18-140825-W		1600		X			1			3			X	X	See Table B-1
-4-8 MW18-140825-MS		1550		X			1			3			X	X	thru B-4 of
-4-6 MW18-140825-MSD		1555		X			1			3			X	X	Compliance monitoring
-5-7 TRIP BLANK				X						3				X	plan

580-45117 Chain of Custody

Cooler TB Dig/IR cor 5.6 A2 unc 5.9
Cooler Dsc Lg Red/wh @Lab
Wet/Packs Packing bubb
Client drop

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Cooler ☐ Yes ☐ No Cooler Temp: _____

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal ☐ Return To Client ☐ Disposal By ☐ Archive For _____ Months (are retained longer than 1 month)

Turn Around Time Required (business days)
☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☐ Other _____

QC Requirements (Specify)

	Sign/Print	Date	Time
1. Relinquished By	Paul Poblocki	8/25	1720
1. Received By	Tom Blankinship	8/25/14	1720
2. Relinquished By			
2. Received By			
3. Relinquished By			
3. Received By			

Comments

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (0210)

Login Sample Receipt Checklist

Client: GeoEngineers Inc

Job Number: 580-45117-1

Login Number: 45117

List Source: TestAmerica Seattle

List Number: 1

Creator: Blankinship, Tom X

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	The MS & MSD samples have different times than the parent; logged in w/earliest.
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX B
Data Quality Assessment Summary

GeoEngineers

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Data Validation Report

Project:	City of Olympia – 318 NE State Avenue Property Fifth Semi-Annual Groundwater Monitoring, August 2014
GEI File No:	0415-049-06
Date:	September 12, 2014

This report documents the results of a United States Environmental Protection Agency (USEPA)-defined Stage 2A data validation (USEPA Document 540-R-08-005; USEPA, 2009) of analytical data from the analyses of groundwater samples collected as part of the Fifth Semi-Annual Groundwater Monitoring sampling event, and the associated laboratory and field quality control (QC) samples. The samples were obtained from the 318 NE State Avenue Property located in Olympia, Washington.

OBJECTIVE AND QUALITY CONTROL ELEMENTS

GeoEngineers, Inc. (GeoEngineers) completed the data validation consistent with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (USEPA, 2008) and Inorganic Superfund Data Review (USEPA 2010) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

- The samples were analyzed using well-defined and acceptable methods that provide reporting limits below applicable regulatory criteria;
- The precision and accuracy of the data are well-defined and sufficient to provide defensible data; and
- The quality assurance/quality control (QA/QC) procedures utilized by the laboratory meet acceptable industry practices and standards.

In accordance with the Quality Assurance Project Plan (QAPP), Appendix B of the Groundwater Compliance Monitoring Plan (GeoEngineers, 2010), the data validation included review of the following QC elements:

- Data Package Completeness
- Chain-of-Custody Documentation
- Holding Times and Sample Preservation
- Surrogate Recoveries
- Method and Trip Blanks
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples/Laboratory Control Sample Duplicates
- Laboratory and Field Duplicates

VALIDATED SAMPLE DELIVERY GROUPS

This data validation included review of the sample delivery group (SDG) listed below in Table 1.

TABLE 1: SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS

Laboratory SDG	Samples Validated
580-45117-1	DUP01-140825-W, MW03-140825-W, MW16-140825-W, MW18-140825-W, TRIP BLANK

CHEMICAL ANALYSIS PERFORMED

TestAmerica Laboratory, Inc. (TestAmerica), located in Fife, Washington, performed laboratory analysis on the groundwater samples using the following methods:

- Volatile Organic Compounds (VOCs) by Method SW8260B; and
- Sulfate Anions by Method EPA 300.0

DATA VALIDATION SUMMARY

The results for each of the QC elements are summarized below.

Data Package Completeness

TestAmerica provided all required deliverables for the data validation according to the National Functional Guidelines. The laboratory followed adequate corrective action processes and all identified anomalies were discussed in the relevant laboratory case narrative.

Chain-of-Custody Documentation

Chain-of-custody (COC) forms were provided with the laboratory analytical reports. The COCs were accurate and complete when submitted to the lab, with the exception identified below.

SDG 580-45117-1: The laboratory noted that Sample MW18-140825-W was listed on the COC as three separate samples to include the matrix spike and matrix spike duplicate (MS/MSD), each with a different time. The laboratory logged Sample MW18-140825-W with a time of 15:50 and assigned the MS/MSD to this sample.

Holding Times and Sample Preservation

The sample holding time is defined as the time that elapses between sample collection and sample analysis. Maximum holding time criteria exist for each analysis to help ensure that the analyte concentrations found at the time of analysis reflect the concentration present at the time of sample collection. Established holding times were met for all analyses. The sample cooler arrived at the laboratory within the appropriate temperatures of between two and six degrees Celsius.

Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the organic analytes of interest, but unlikely to be found in any environmental sample. Surrogates are used for organic analyses and are added to all samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added to the samples at a known concentration and percent recoveries are calculated following analysis. All surrogate percent recoveries for field samples were within the laboratory control limits.

Method and Trip Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. A method blank was analyzed with each batch of samples, at a frequency of 1 per 20 samples. For all sample batches, method blanks for all applicable methods were analyzed at the required frequency. None of the analytes of interest were detected above the reporting limits in any of the method blanks.

Trip blanks are analyzed to assess whether field sampling or sample transport processes may have introduced measurable concentrations of volatile analytes of interest into project samples. None of the analytes of interest were detected above the reporting limits in the trip blank.

Matrix Spikes/Matrix Spike Duplicates

Since the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis on one sample from the associated batch, known as the parent sample. One aliquot of the sample is analyzed in the normal manner and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery is calculated. Matrix spike duplicate (MSD) analyses are generally performed for organic analyses as a precision check and analyzed in the same sequence as a matrix spike. Using the result values from the MS and MSD, the relative percent difference (RPD) is calculated. The percent recovery control limits for MS and MSD analyses are specified in the laboratory documents, as are the RPD control limits for MS/MSD sample sets.

One MS/MSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements for MS/MSD analysis were met and the percent recovery and RPD values were within the proper control limits.

Laboratory Control Samples/Laboratory Control Sample Duplicates

A laboratory control sample (LCS) is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Given that matrix interference is not an issue, the LCS/LCSD control limits for accuracy and precision are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS/LCSD analyses would apply to all samples in the associated batch, instead of just the parent sample. The percent recovery control limits for LCS and LCSD analyses are specified in the laboratory documents, as are the RPD control limits for LCS/LCSD sample sets.

One LCS/LCSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements LCS/LCSD analysis were met and the percent recovery and RPD values were within the proper control limits.

Laboratory Duplicates (Anions Only)

Internal laboratory duplicate analyses are performed to monitor the precision of the analyses. Two separate aliquots of a sample are analyzed as distinct samples in the laboratory and the RPD between the two results is calculated. Duplicate analyses should be performed once per analytical batch. If one or more of the samples used has a concentration less than five times the reporting limit for that sample, the absolute difference is used instead of the RPD. The RPD control limits are specified in the laboratory documents. Laboratory duplicates were analyzed at the proper frequency and the specified acceptance criteria were met.

Field Duplicates

In order to assess precision, a field duplicate sample was collected and analyzed along with the reviewed sample batches. The duplicate sample was analyzed for the same parameters as the associated parent sample. Precision is determined by calculating the RPD of sample concentrations between each pair of samples. If one or more of the sample analytes has a concentration greater than five times the reporting limit for that sample, then the absolute difference is used instead of the RPD. The RPD control limit for water samples is 35 percent.

SDG 580-45117-1: One field duplicate sample pair, MW16-140825-W and DUP01-140825-W, was submitted with this SDG. The precision criteria for all target analytes were met for this sample pair.

OVERALL ASSESSMENT

As was determined by this data validation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the surrogate, LCS/LCSD, and MS/MSD percent recovery values. Precision was acceptable, as demonstrated by the LCS/LCSD, MS/MSD, and laboratory/field duplicate RPD values.

No analytical results were qualified. All data are acceptable for the intended use.

REFERENCES

GeoEngineers, Inc. "Groundwater Compliance Monitoring Plan," prepared for City of Olympia. April 16, 2010.

U.S. Environmental Protection Agency (USEPA). "Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," EPA-540-R-08-01. June 2008.

U.S. Environmental Protection Agency (USEPA). "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use," EPA-540-R-08-005. January 2009.

U.S. Environmental Protection Agency (USEPA). "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," EPA-540-R-10-011. January 2010.