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Soil Vapor Extraction System 2015 – 2017 Report

Former Frank Wear Cleaners Site
Yakima, Washington

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Prepared for

Washington State Department of Ecology
Central Regional Office
1250 W. Alder Street
Union Gap, WA 98903

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List of Acronyms

Acronym	Description
ASIL	acceptable source impact level
ATL	Air Toxics, Ltd.
bgs	below ground surface
CFM	cubic feet per minute
cis-1,2-DCE	cis-1,2-dichloroethene
COC	chemical of concern
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
GAC	granular activated carbon
H&P	H&P Mobile Geochemistry
mL	milliliter
MTCA	Model Toxics Control Act
PCE	tetrachloroethene
SCFM	standard cubic feet per minute
SIM	selective ion monitoring
SSD	subslab depressurization
SVE	soil vapor extraction
TCE	trichloroethene
VLS	vapor liquid separator
VOC	volatile organic compound
$\mu g/m^3$	micrograms per cubic meter
WC	water column
YRCAA	Yakima Regional Clean Air Agency

Section 1: Introduction

Kennedy/Jenks Consultants, on behalf of the Washington State Department of Ecology (Ecology), has prepared this *Soil Vapor Extraction System 2015-2017 Report* (Report) to document the operation, maintenance, and monitoring of the soil vapor extraction (SVE) system at the former Frank Wear Cleaners site (site) located at 106 South Third Avenue, in Yakima, Washington (Figure 1).

A dry cleaning facility operated on a portion of the site from early 1940s to 2000. During many of those years, the dry cleaner used tetrachloroethene (PCE) as the dry cleaning solvent. As a result of the past dry cleaning operations, PCE has been detected in soil vapor, soil, and groundwater at and adjacent to the site. A building located adjacent to the former Frank Wear Cleaners building is currently operated as a childcare center. The locations of the former Frank Wear Cleaners building and childcare center are shown on Figure 1.

In September and October 2011, a vapor intrusion study was performed at the childcare center to evaluate whether PCE or other volatile organic compounds (VOCs) might be migrating into the childcare center building that is occupied during the day by children or onsite staff. As part of the vapor intrusion study, indoor and ambient outdoor air samples, as well as subslab soil vapor samples were collected for chemical analyses. PCE was detected in indoor air samples collected at the childcare center at concentrations greater than the Model Toxics Control Act (MTCA) Method B indoor air cleanup level, prompting implementation of an interim remedial action (Kennedy/Jenks Consultants 2011).

In 2012, an SVE system was constructed at the site with the primary objective of mitigating vapor intrusion of PCE and other chemicals of concern (COCs) by inducing a vacuum [i.e., subslab depressurization (SSD)] beneath the childcare center building concrete slab (Kennedy/Jenks Consultants 2012a). The SVE system included construction of five SVE wells (SVE-1 through SVE-5) at locations adjacent to the childcare center and within the footprint of the former Frank Wear Cleaners building where PCE is believed to have been released (Figure 2) and installation of five subslab monitoring points (SS-1 through SS-5) inside the childcare center building (Figure 3). The SVE wells were constructed with an upper and lower screen interval to provide operational flexibility for removal of contaminant mass in the unsaturated zone to accommodate for seasonal groundwater fluctuations associated with localized recharge from irrigation canals. Depth to groundwater typically ranges from approximately 20 to 25 feet below ground surface (bgs) during the winter months (December through June) and from approximately 12 to 18 feet bgs throughout the remainder of the year. Extracted soil vapor from the SVE system is treated using vapor-phase granular activated carbon (GAC) prior to atmospheric discharge, complying with the requirements from the Yakima Regional Clean Air Agency (YRCAA) (Kennedy/Jenks Consultants 2012b).

SVE system operation, maintenance, and monitoring data from startup in 2012 through September 2015 are presented in the following reports previously submitted to Ecology:

- *Soil Vapor Extraction (SVE) System 2012-2013 Annual Report* (Kennedy/Jenks Consultants 2014)

- *Soil Vapor Extraction (SVE) System 2013-2014 Annual Report* (Kennedy/Jenks Consultants 2015)

- *Soil Vapor Extraction (SVE) System 2014-2015 Annual Report* (Kennedy/Jenks Consultants 2016).

This report summarizes activities performed between October 2015 and May 2017, and includes an evaluation of system performance and recommendations for future operation, maintenance, and monitoring.

Section 2: SVE System Operation, Monitoring, Sampling Results, and Data Analyses

This section summarizes the SVE system operation, maintenance, and monitoring for October 2015 to May 2017, including sampling results and data analyses.

2.1 SVE System Operation and Monitoring

The SVE system operated in the following configurations:

- Extraction from the upper zone at all wells (SVE-1, SVE-2, SVE-3, SVE-4, and SVE-5) from September 2015 to early January 2016.
- Extraction from the lower zone at all wells following a system modification on 8 January 2016.
- Extraction from the upper zone at SVE-1 and SVE-4 and from the lower zone at SVE-2, SVE-3, and SVE-5, from January to May 2016; following a system modification on 21 January 2016, SVE-1 and SVE-4 were switched to extract from the upper zone after moisture was observed from the lower zone in these wells, which collected in the vapor liquid separator (VLS) tank at a rate of approximately 100 gallons every 2 to 3 days.
- Extraction from the upper zone at all wells (SVE-1, SVE-2, SVE-3, SVE-4, and SVE-5) from May to late December 2016.
- Extraction from the lower zone at all wells (SVE-1, SVE-2, SVE-3, SVE-4, and SVE-5) and the upper zone at SVE-4 from December 2016 to May 2017.

The extracted soil vapor is treated using vapor-phase GAC prior to discharge to the atmosphere. During warmer weather months (June to November), extracted soil vapor was treated with the GAC vessels positioned on the vacuum side of the blower. In order to reduce the generation of condensation within the system during the colder weather months (typically December to May), extracted soil vapor was treated with the GAC vessels positioned on the discharge side of the blower which increased the vapor temperature prior to treatment in the GAC vessel.)

During the October 2015 to May 2017 operational period, SVE system monitoring was conducted, in general, on a monthly basis and following system modifications by Ecology personnel (i.e., change from upper to lower zone operation) as follows:

- The flow rate was measured for each individual well using a hot-wire anemometer. The total flow rate was measured at the blower outlet (pitot-tube assembly).
- Vacuum or pressure readings were recorded from gauges for the individual wells at the extraction manifold, in addition to blower inlet and outlet readings.
- Vapor temperature was measured at the blower inlet and outlet.

- Performance monitoring soil vapor samples were collected at the influent (total influent), between the GAC vessels (i.e., midpoint), and the effluent port and submitted for chemical analyses. Performance monitoring samples were also collected following system modifications.

- Vacuum was measured at subslab monitoring points SS-1, SS-2, SS-3, and SS-5 in the childcare center building to monitor the effectiveness of the SSD system (Figure 3). See Section 3.1.2 for additional information regarding abandonment of subslab monitoring point SS-4 in March 2015.

SVE system and subslab measurements are summarized in Tables 1 and 2, respectively. System performance monitoring logs were completed during each site visit and are presented in Appendix A.

2.2 SVE System Operation and Monitoring Analysis

SVE system operation and monitoring observations are summarized below.

Soil vapor was generally extracted at flow rates between 40 and 100 standard cubic feet per minute (SCFM) in the upper zone for each of the SVE wells at an applied vacuum of approximately 10 to 15 inches water column (WC). Flow rates ranged from 20 to 80 SCFM in the lower zone at an applied vacuum of approximately 20 to 40 inches WC. A flow rate of 10 SCFM or less was observed in the upper and lower zone at SVE-3. Soil vapor was extracted at higher flow rates from the lower zone at SVE-1, SVE-2, SVE-4, and SVE-5 compared to SVE-3.

At these flow rates, the vacuum measured beneath the childcare center concrete slab ranged from 0.008 to 0.093 inch WC with greater vacuum response observed while extracting soil vapor from the upper zone.

While system operations were modified and system upgrades were performed in 2013 to minimize condensation, some condensation was observed in the VLS and GAC vessels, particularly while extracting from the lower zone during winter months.

2.3 SVE System Sampling and Analysis

The following SVE system soil vapor samples were collected between October 2015 and May 2017:

- An effluent sample on 8 June 2016 (prior to system modification) when all wells were extracting from the upper screen interval.

- Influent (total influent and individual well influent), between the GAC vessels (i.e., midpoint), and the effluent samples on 8 January 2016 when all wells were extracting from the lower screen interval.

- Influent (total influent), midpoint, and effluent samples on 14 April 2017 when wells were extracting from lower screen interval.

Soil vapor samples were collected in pre-cleaned, evacuated 400-milliliter (mL) Summa™ canisters using a short piece of new Tygon tubing connecting the sampling barb on the Summa™ canister to the barb(s) on each ½-inch ball valve on the SVE system. Samples were submitted to H&P Mobile Geochemistry (H&P) of Carlsbad, California, under chain-of-custody protocol and analyzed for VOCs using modified U.S. Environmental Protection Agency (EPA) Method TO-15 (unless otherwise noted). SVE system sample analytical results are summarized in Table 3. Laboratory analytical reports for SVE system samples are presented in Appendix B.

During the October 2015 to May 2017 operational period, the following trends were observed:

- Total influent PCE soil vapor concentrations ranged from 260 to 4,800 micrograms per cubic meter (µg/m^3) during lower zone operation (measured in April 2017 and January 2016, respectively). PCE concentrations trends in total influent and effluent samples are summarized on Figure 4.

- Trichloroethene (TCE) was detected in the total influent samples at concentrations ranging from 7.6 to 310 µg/m^3 (measured in April 2017 and January 2016, respectively). Cis-1,2-dichloroethene (cis-1,2-DCE) was reported in total influent samples at concentrations ranging from less than the reporting limit (4.0 µg/m^3) to 340 µg/m^3 (measured in April 2017 and January 2016, respectively). These PCE biodegradation byproducts appear to be attributed to reductive dechlorination from operation of the enhanced bioremediation/groundwater recirculation system by Hart Crowser at the site (Fowler 2015).

- PCE vapor concentrations were below the laboratory reporting limits of 6.9 µg/m^3 to 180 µg/m^3 in the three effluent samples (January 2016, June 2016, and April 2017). The overall removal efficiency for PCE from both GAC vessels was estimated at or above 95 percent from October 2015 to May 2017. The PCE removal efficiency between the first and second GAC vessels was significantly lower, indicating breakthrough at the first carbon vessel. The effluent concentrations reported in the January 2016, June 2016, and April 2017 samples were below the acceptable source impact level (ASIL) of 5,016 µg/m^3 (Kennedy/Jenks Consultants 2012b).

- TCE was detected in effluent vapor samples collected in January 2016 (360 µg/m^3) and June 2016 (210 µg/m^3), below the maximum average effluent concentration to meet the acceptable source impact level (ASIL) of 14,840 µg/m^3 (Kennedy/Jenks Consultants 2012b). TCE was not detected above the laboratory reporting limit (5.5 µg/m^3) in the effluent vapor sample collected in April 2017.

2.4 SVE System Mass Removal Estimates

Cumulative total VOC and PCE mass removal rates were calculated as the product of the influent VOC (sum of detected VOC constituent concentrations) and PCE concentrations averaged between sampling events, the measured influent flow rate [average of approximately 273 cubic feet per minute (CFM)], and the time since the previous sampling event. For the purpose of this evaluation, measured airflow rates and concentrations were assumed to be constant between sampling events as the SVE system has experienced minimal downtime.

During the October 2015 to May 2017 operational period, PCE and cumulative VOC mass removal was estimated at approximately 38 and 47 pounds, respectively. Since SVE system startup in July 2012, PCE and cumulative VOC mass removal were estimated at approximately 245 pounds and 302 pounds, respectively. VOC and PCE mass removal estimates are summarized in Table 4. Influent PCE and VOC concentrations and the estimated cumulative total PCE and VOC mass removed are shown on Figure 5. During the October 2015 to May 2017 operational period, sustained PCE mass removal is attributed to: (1) volatilization from the unsaturated zone, particularly during low groundwater conditions, and (2) off-gassing as PCE from groundwater.

2.5 SVE System Maintenance and Modifications

Routine system maintenance includes inspection of mechanical components, removal of condensate accumulated in the VLS vessel. Condensate removed from the VLS was temporarily stored onsite in a polyethylene tank and was transferred to the enhanced bioremediation/groundwater recirculation system for reuse.

During the 2015 to 2017 operational period, an increase in accumulation of condensate water was observed in the VLS, particularly while extracting from the lower zone during the winter months. An increase in condensate is likely attributed to lower ambient air temperatures as moist, extracted soil vapor condenses within system components during the winter.

2.5.1 GAC Replacement

On 6 April 2017, the system was temporarily shut down, and Calgon contractors performed a carbon exchange onsite for the two GAC vessels associated with the SVE system. The spent carbon was removed from the GAC vessels and transferred into 1,000-pound super sacks for disposal. The GAC vessels were cleaned and filled with approximately 4,000 pounds of Calgon's OVC 4x8 virgin coconut shell vapor phase carbon. A DOT-approved hazardous waste transport contractor transported the spent carbon to Calgon's facility at:

- Calgon Carbon Corporation / Big Sandy Plant
  Route 23, PO Box 664
  Catlettsburg, Kentucky 41129
  Tel: (606) 739-8681
  EPA Facility ID #KYD005009923

The completed uniform hazardous waste manifest that documents transport and disposal of the spent carbon is presented in Appendix C. Following the carbon changeout, soil vapor sample collection was conducted on 14 April 2017. Analytical results for SVE treatment vapor samples are presented on time-concentration graphs (Figure 4), summarized in Table 3, and discussed in Section 2.3.

Section 3: Indoor Air, Ambient Air, and Subslab Soil Vapor Sampling

Indoor air, outdoor ambient air, and subslab soil vapor sampling were performed on a quarterly basis between September 2012 and September 2015 to evaluate the vapor intrusion pathway and to evaluate the effectiveness of the SVE system at mitigating vapor intrusion at the childcare center. Due to a reduction in available funding during the October 2015 to May 2017 operational period, indoor air, outdoor ambient air, and subslab vapor sampling was conducted at the childcare center on an annual basis (7 January 2016 and 14 April 2017), as the historical data have demonstrated that operation of the SVE system was effectively mitigating potential vapor intrusion. Field logs for indoor air and subslab sampling activities are presented in Appendix D. Laboratory analytical reports for indoor air, outdoor ambient air, and subslab soil vapor samples are presented in Appendix E.

3.1.1 Indoor and Outdoor Ambient Air

Indoor air samples were collected from two locations (NE Corner Nap/Play Area and SE Corner Nap/Play Area) within the childcare center and the outdoor ambient air samples were collected at the northwestern corner of the property (typically upwind of the site; the prevailing wind direction is from the west). Indoor air and outdoor ambient air samples were analyzed for VOCs using EPA Method TO-15, with selected compounds analyzed in selective ion monitoring (SIM) mode at Eurofins/Air Toxics, Ltd. (ATL) of Folsom, California. Indoor air and outdoor ambient air analytical results for the childcare center are summarized in Table 5. The following is a summary of pertinent indoor air and outdoor air sampling results for the childcare center:

- PCE was reported in the indoor air samples collected in January 2016 at a concentration of 0.74 µg/m^3. This concentration is below the indoor air PCE concentrations reported in samples collected in 2011 (5.7 µg/m^3 to 6.6 µg/m^3) prior to SVE system startup in June 2012 and is below the MTCA Method B indoor air cleanup level of 9.6 µg/m^3. PCE was detected in the January 2016 outdoor ambient air sample at a concentration of 1.3 µg/m^3 (greater than the reported indoor air concentration). PCE was not reported in indoor or outdoor ambient air samples collected during the April 2017 sampling event at or greater than laboratory reporting limits.

- Chloroform was reported in the indoor air samples at concentrations ranging from 0.86 to 1.6 µg/m^3, which exceed the MTCA Method B cleanup level for indoor air of 0.109 µg/m^3. Chloroform was not reported in the outdoor ambient samples.

  As noted in the *Vapor Intrusion Study Report* (Kennedy/Jenks Consultants 2011), occupants at the childcare center reported that bleach and tap water were used for daily cleaning and may be the primary source of chloroform to indoor air. During the January 2016 and April 2017 sampling events, the owners and occupants of the childcare center continued the practice of using bleach for daily cleaning. The indoor air chloroform concentrations appear to correlate with the occupant's use of bleach for cleaning.

- Benzene was reported in the indoor air samples at concentrations ranging from 0.73 to 2.8 µg/m^3, above the MTCA Method B indoor air cleanup level of 0.32 µg/m^3. Benzene

was reported in outdoor ambient air samples at concentrations ranging from 0.82 to 2.5 µg/m^3. Because benzene was reported at similar concentrations in the upwind outdoor air samples collected at the site during the same sampling events, these indoor air concentrations appear to be attributed to ubiquitous benzene commonly associated with industrial and urban areas.

[Note: While reasonable efforts were made by the analytical laboratory to attain reporting limits adequate for comparison to the MTCA Method B indoor air cleanup levels, it is important to note analytical method reporting limits may be greater than the indoor air cleanup levels, in which case, the lowest method reporting limit achievable by the analytical laboratory was used. The reporting limits for chloroform and 1,2-dichloroethane were above the MTCA Method B indoor air cleanup levels for all indoor and outdoor ambient air samples collected.]

3.1.2 Subslab Soil Vapor

Subslab pressure monitoring points (Vapor Pins™) were installed following SVE system construction activities by drilling holes through the floor slab at five locations (SS-1 through SS-5; Figure 3). On 7 January 2016 and 14 April 2017, subslab soil vapor samples were collected from below the concrete slab of the childcare center at SS-1 (NE Corner Nap/Play Area) and -SS-5 (SW Corner Nap/Play Area) based on their proximity to indoor air sample locations. Subslab monitoring point SS-4 was abandoned in March 2015 and backfilled with concrete to match the existing slab.

Prior to subslab soil vapor sample collection, connector tubing was used to join the monitoring point to the sampling train (vacuum gauge, Summa™ canister, and connector fittings). The sampling train was tested for possible leaks by conducting a shut-in test, which consisted of applying a vacuum on the sampling train and observing whether vacuum loss occurred over a period of 60 seconds. Then, the subslab monitoring points were tested for leaks by placing a shroud over the subslab monitoring point.

Helium was introduced into the shroud, and concentrations were maintained at approximately 50 to 90 percent while purging and sampling each subslab sampling location. The dead volume of the connecting tubing and sampling train was purged by removing approximately 200 mL of air from the probe. The purged air was tested immediately using a portable helium meter to evaluate the probe for potential leaks. Subslab soil vapor samples were then collected using individually certified 6-liter Summa™ canisters. Following sample collection, the valve on the sample tubing was closed upon completion of sampling, and the Vapor Pin™ was covered until the next sampling event.

Subslab soil vapor samples were analyzed for VOCs by modified EPA Method TO-15 and for helium by ASTM Method 1945-46 by H&P. Subslab soil vapor analytical results are summarized in Table 6. The following is a summary of pertinent subslab soil vapor sampling results:

- PCE was reported in the subslab soil vapor samples at concentrations ranging from less than the laboratory reporting limit of 6.9 µg/m^3 to 23 µg/m^3, below the screening level for subslab soil vapor of 321 µg/m^3 (calculated using a 30-fold attenuation factor from the MTCA Method B indoor air cleanup levels).

- Chloroform was reported in subslab soil vapor at concentrations below the screening level for subslab soil vapor of 3.6 µg/m^3.

- Benzene was reported in subslab soil vapor at concentrations ranging from less than the laboratory reporting limit of 0.16 µg/m^3 to 2.2 µg/m^3, below the subslab soil vapor screening level of 10.7 µg/m^3. Other VOCs detected in subslab soil vapor samples include 1,2-dichloroethane, toluene, ethylbenzene, m,p-xylene, o-xylene, methylene chloride, and cis-1,2-DCE with concentrations below applicable subslab soil vapor screening levels.

PCE concentrations in the indoor air and subslab soil vapor have significantly decreased since startup of the SVE system in July 2012. Indoor air benzene concentrations are likely attributed to outdoor ambient air or an indoor air source, as indoor air benzene concentrations are often slightly higher than subslab soil vapor concentrations.

Section 4: Conclusions and Recommendations

This section presents a summary of conclusions and recommendations for future system operation, maintenance, and monitoring.

4.1 Conclusions

Kennedy/Jenks Consultants understands Ecology plans to continue operation, maintenance, and monitoring of the SVE system to mitigate vapor intrusion, remove mass from the unsaturated zone, and capture PCE and its daughter products produced through anaerobic reductive dechlorination during enhanced bioremediation in the saturated zone.

Based on evaluation of SVE system operation, maintenance, and monitoring data:

- The SVE system has been effective at mitigating vapor intrusion to the childcare center, particularly with extraction of soil vapor. The induced vacuum beneath the childcare center concrete slab occurring through operation of the SVE system has ranged from 0.008 to 0.093 inch WC, which appears to be sufficient to mitigate vapor intrusion into the building as evidenced by the reduction in indoor air and subslab soil vapor PCE concentrations. Indoor air sampling results since 2012 indicate PCE concentrations have decreased significantly since SVE system startup in June 2012 and have been consistently below the MTCA Method B indoor air cleanup level of 9.6 µg/m^3.

- Indoor air benzene concentrations are likely attributed to outdoor ambient air or an indoor source, as indoor air benzene concentrations are often slightly higher than subslab soil vapor concentrations. Benzene indoor air concentrations may be attributed to ubiquitous benzene in outdoor air commonly associated with industrial and urban areas. Chloroform detections in indoor air are likely associated with the occupant's use of bleach and tap water for cleaning.

- Since SVE system startup in June 2012, PCE and cumulative VOC mass removal were estimated at approximately 245 pounds and 302 pounds, respectively.

- PCE removal efficiency for this reporting period was estimated to be above 95 percent. PCE, TCE, and vinyl chloride concentrations in GAC vessel effluent samples were well below respective average effluent concentrations that would result in an exceedance of the corresponding ASIL, complying with the requirements of the YRCAA.

- PCE degradation byproducts TCE, cis-1,2-DCE, and/or vinyl chloride were reported in the total influent soil vapor samples collected between October 2015 and May 2017. The detection of PCE byproducts in soil vapor is attributed anaerobic reductive dechlorination process (Fowler 2015).

4.2 Recommendations

Overall, the SVE system has been effective at mitigating vapor intrusion while removing PCE/VOC mass from the unsaturated (vadose) zone and groundwater. Recommendations for future SVE system operation, maintenance, and monitoring are as follows:

- During high groundwater conditions, extract soil vapor from the upper zone at all wells to maintain a slight vacuum (target of greater than 0.025 inch WC) beneath the childcare center concrete slab.

- During low groundwater conditions (typically during December to May), extract soil vapor from the lower zone at all wells to target PCE/VOC mass removal while extracting from the upper zone at the same time to maintain SSD. This may involve consecutive rounds of adjustment and subslab vacuum measurements to achieve optimal deeper soil vapor removal while maintaining adequate SSD.

- During winter months, perform treatment of extracted soil vapor with the GAC vessels positioned on the discharge side of the blower to minimize condensate generation. During the summer months, discharge temperatures should be monitored as it relates to vinyl chloride absorption efficiency.

- Continue monitoring of SVE system parameters (flow rate, vacuum/pressure, temperature, etc.) and collect SVE system samples on a quarterly basis and during system modification events for chemical analyses.

- Continue collection of indoor air, outdoor ambient air, and subslab soil vapor samples for chemical analyses on periodic basis to document system performance and effectiveness.

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Tables

Table 1: SVE System Measurements

Date	Ambient Temperature (degrees F)	Approximate Blower Inlet Vacuum (in. WC)	Measured Blower Inlet Differential Pressure (in. WC)	Approximate Blower Inlet Flow Rate (CFM)[a]	Blower Inlet Temperature (degrees F)	Blower Discharge Temperature (degrees F)	VLS Vacuum (in. WC)	Lead GAC Vacuum (in. WC)	Lag GAC Vacuum (in. WC)	SVE-1 Upper Screen Interval (7.92 - 12.92 ft from TOC) Lower Screen Interval (14.92 - 19.92 ft from TOC)										SVE-2 Upper Screen Interval (7.96 - 12.96 ft from TOC) Lower Screen Interval (14.96 - 19.96 ft from TOC)									
										Manifold Vacuum (in. WC)		Manifold Flow Rate (CFM)[b]		Manifold Temperature (degrees F)		Well Head Vacuum (in. WC)		DTW from TOC		Manifold Vacuum (in. WC)		Manifold Flow Rate (CFM)[b]		Manifold Temperature (degrees F)		Well Head Vacuum (in. WC)		DTW from TOC	
										Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
6/25/2012	82	38	--	250	85	145	29	--	--	--	30	--	25	--	82	0.06	28	--	19.84	--	28	--	32.5	--	84	0.25	27	--	18.30
6/25/2012	82	22.5	--	285	87	130	11	--	--	9.0	--	69	--	82.5	--	0.8	0.12	19.84	--	9	--	40	--	82.7	--	6.5	0.27	18.30	--
6/27/2012	63	46	--	250	70	134	37.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6/27/2012	63	31	--	255	74	128	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7/3/2012	77	34	--	249	83	132	21	23	29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7/12/2012	96	31	--	258	92	142	20.2	22	28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8/13/2012																													
8/28/2012																													
9/12/2012	90	32	1	212	87	139	21	23.5	29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9/25/2012	82	32	1.75	281	84	139	21	23	29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11/5/2012	65	34	--	353	68	123	23	25	31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/11/2012	37	41	1.50	254	45	111	23	25	38	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/12/2012	37	43	1.50	256	52	114	23	26	38	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/18/2012	27	49	1.25	235	50	122	20	28	46	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/27/2012	32	52	1.20	232	50	122	20	26	48	--	--	--	--	--	--	0.021	0.034	--	--	--	--	--	--	--	--	0.057	0.7	--	--
12/28/2012	28	38	1.65	265	46	100	25	28	33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/11/2013	35	37	1.70	270	51	110	25	34	28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/22/2013	25	47	1.40	247	44	110	23	42	32	--	--	--	--	--	--	0.059	0.061	--	--	--	--	--	--	--	--	0.022	0.034	--	--
2/21/2013	--	51	1.25	235	46	120	20	30	46	--	--	--	--	--	--	0.020	0.033	--	--	--	--	--	--	--	--	0.057	0.003	--	--
2/21/2013	43	37	1.60	262	50	110	25	27	31	--	--	--	--	--	--	0.016	0.030	--	--	--	--	--	--	--	--	0.060	0.065	--	--
3/12/2013	40	41	1.60	264	52	112	24	28	36	--	--	--	--	--	--	0.020	0.033	--	dry	--	--	--	--	--	--	0.058	0.064	--	dry
3/14/2013	54	36.5	1.70	271	56	112	25	26.5	31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5/13/2013	64	34	1.75	278	70	126	22.5	25	29	--	--	--	--	--	--	0.03	0.02	--	--	--	--	--	--	--	--	0.06	0.07	--	--
5/14/2013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.021	0.025	--	--	--	--	--	--	--	--	0.076	0.098	--	--
6/14/2013	72	31	1.75	281	88	140	22	24	26.5	--	--	--	--	--	--	0.017	0.027	--	--	--	--	--	--	--	--	0.081	0.103	--	--
9/19/2013	55	33	1.80	281	69	123	23	25	28	--	--	--	--	--	--	0.018	+0.025	--	--	--	--	--	--	--	--	0.096	+0.022	--	--
11/20/2013	45	35	1.75	276	60	115	24	26	29	--	--	--	--	--	--	0.036	0.038	--	--	--	--	--	--	--	--	0.072	0.102	--	--
11/21/2013	39	25.5	1.70	269	64	124	24	+12.5	+9.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/6/2013	20	26	1.70	269	62	120	25	+9.8	+6.8	--	--	--	--	--	--	0.074	0.011	--	--	--	--	--	--	--	--	0.032	0.045	--	--
12/6/2013	19	21.5	1.65	264	63	121	24.5	+9.8	+6.8	--	--	--	--	--	--	0.056	0.070	--	--	--	--	--	--	--	--	0.031	0.050	--	--
12/6/2013	25	33	1.50	255	63	126	30	+8.8	+6.0	--	--	--	--	--	--	0.055	0.080	--	--	--	--	--	--	--	--	0.040	0.040	--	--
12/6/2013	25	43	1.20	232	63	133	41	+7.3	+5.1	--	--	--	--	--	--	0.060	0.080	--	--	--	--	--	--	--	--	0.030	0.045	--	--
12/6/2013	25	36	1.40	248	63	130	34	+8.4	+5.8	--	--	--	--	--	--	0.040	0.057	--	--	--	32	--	41	--	58	0.327	>16	--	--
12/6/2013	23	32	1.55	259	62	124	30	+8.9	+6.2	--	27.5	--	30	--	64	0.067	>16	--	--	--	28	--	36	--	58.2	0.270	>16	--	--
12/6/2013	23	26	1.65	265	61	120	24.5	--	--	--	21	--	--	--	--	--	--	--	--	--	21	--	--	--	--	--	--	--	--
12/10/2013	18	27.5	1.65	265	62	122	26	+9.7	+6.7	--	23	--	84 - 123	--	57 - 64	0.050	6 - 15	--	--	--	23	--	70 - 90	--	68.1	0.220	>16	--	--
1/7/2014	30	27.5	1.65	265	60	120	25	+9.05 - +9.7	+6.75 - +6.8	--	22.5	--	30 - 120	--	62.3	0.040	5 - 14	--	--	--	22.5	--	50 - 90	--	65.7	0.235	>16	--	--
2/5/2014	19	28	1.65	265	60	116	--	+9.9	+6.8	--	22	--	80	--	58.2	0.050	11.6 -15	--	--	--	22	--	50	--	57.4	0.274	>16	--	--
4/11/2014	57	27.5	1.60	262	64	126	25.5	+9.8	+6.8	--	23	--	28	--	76.7	0.050	>16	--	--	--	23.5	--	13	--	75.5	0.151	>16	--	--
6/5/2014	72	30	1.50	256	70	140	27.5	+9.3	+6.5	--	27	--	24	--	83.7	0.061	>16	--	--	--	27	--	11	--	86.9	0.039	>16	--	--
6/6/2014	75	23	2.00	302	90	135	12	9	5.5	9.0	--	74	--	85.3	--	1.36	0.118	--	--	9	--	38	--	86.2	--	7.24	0.005	--	--
9/12/2014	55	24	2.00	294	72	119	13	9	6	10.0	--	78	--	82.6	--	1.474	0.033	--	--	10	--	39	--	86.2	--	7.59	0.019	--	--

Table 1: SVE System Measurements

Date	Ambient Temperature (degrees F)	Approximate Blower Inlet Vacuum (in. WC)	Measured Blower Inlet Differential Pressure (in. WC)	Approximate Blower Inlet Flow Rate (CFM)[a]	Blower Inlet Temperature (degrees F)	Blower Discharge Temperature (degrees F)	VLS Vacuum (in. WC)	Lead GAC Vacuum (in. WC)	Lag GAC Vacuum (in. WC)	SVE-1 Upper Screen Interval (7.92 - 12.92 ft from TOC) Lower Screen Interval (14.92 - 19.92 ft from TOC)										SVE-2 Upper Screen Interval (7.96 - 12.96 ft from TOC) Lower Screen Interval (14.96 - 19.96 ft from TOC)									
										Manifold Vacuum (in. WC)		Manifold Flow Rate (CFM)[b]		Manifold Temperature (degrees F)		Well Head Vacuum (in. WC)		DTW from TOC		Manifold Vacuum (in. WC)		Manifold Flow Rate (CFM)[b]		Manifold Temperature (degrees F)		Well Head Vacuum (in. WC)		DTW from TOC	
										Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
12/3/2014	18	0	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/4/2014	30	14	1.95	282	60	108	15	2 psi	3 psi	12.0	--	110	--	62.8	--	1.50	0.136	--	--	12	--	44	--	59.7	--	7.9	0.030	--	15.10
12/29/2014	34	16	1.90	280	62	116	16	1.5 psi	1.5 psi	13.0	--	92	--	69.1	--	--	--	--	--	13	--	49	--	66	--	--	--	--	--
1/21/2015	30	18.5	1.90	281	60	112	16	3.0 psi	3.5 psi	13.0	--	90	--	66.6	--	9.1	0.26	--	--	13	--	47	--	65.3	--	1.7	0.107	--	--
1/21/2015	32	40	1.35	244	60	126	38	3 psi	3.5 psi	0.0	36.5	--	--	--	--	0.079	OL	--	--	0	37	--	--	--	--	0.047	OL	--	--
1/22/2015	36	43	1.20	231	64	140	41	3.5 psi	3.5 psi	--	39	--	--	--	68 - 72	0.071	OL	--	--	--	40	--	3.8	--	73.9	0.058	OL	--	--
1/26/2015	--	26.5	1.70	266	51	118	24.5	2.5 psi	3.0 psi	10.0	0	--	--	--	--	--	--	--	--	10	0	--	--	--	--	--	--	--	--
3/16/2015	--	27.5	1.60	262	64	126	25.5	2.5 psi	2.5 psi	11.0	--	33	--	67.8	--	--	--	--	--	11	--	74	--	66.2	--	--	--	--	--
5/6/2015	66	26		250	72	133	24	2.5 psi	2.5 psi	9.5	0.002	71	0	81	80.1	1.38	0.007	--	--	8.25	0.073	35.5	0.01	74.6	73.7	6.41	0.027	--	--
5/6/2015	63	34	--	215	82	124	23.5	25	28.5	9.415	0.008	63.8	0.01	76.6	73.6	1.39	0.01			8.09	0.015	29.9	0.01	73.4	72.9	6.27	0.016+		
5/6/2015	63	47.5	--	217	76	144	39	41.5	44	0.024	0.013	0	0	82.3	82.3	0.032	0.008			0.04	0.004	0.01	0.02	72	72.2	0.038	0.007		
5/7/2015	59	48.0	--	219	80	146	40.0	42	45.0	0.027	0	0.51	0.05	87	87	0.029	0.005			0.085	0.058	--	--	76	76.6	0	.008+		
5/7/2015	63	69.0	--	160	77.7	166	62.5	>60	>60	0.015	--	--	--	--	--	0.016	0.006			0.027	0.005	NM	NM	NM	NM	0.017	.001+		
6/24/2015	82	25.0	--	265	88	130	14.0	16	20.0	11.2	0.015+	76	0.01	--	--	1.53	0.02+	--	--	11	0.038	39	0	--	--	0.02+	8.4	--	--
6/25/2015	80	24.0	--	275	80	NM	13.0	16	19.0	10.4	0.011+	73	0.04	--	--	1.50	0.006+	--	--	0.02+	10.7	41	0.04	--	--	1.5	0.006+	--	--
9/25/2015	88	24	--	263	76	122.5	12	15	18	10.0	--	58	--	84.8	--	--	--	--	--	10.5	--	31	--	86.8	--	--	--	--	--
1/7/2016	36	18	1.90	281	64	NM	16	NM	NM	13	0	90	--	69	--	--	--	--	--	13.5	0	43	--	67.2	--	--	--	--	--
1/8/2016	36	43	1.25	236	65	NM	41	NM	NM	0.0	40	--	23-32	--	65.0	--	--	--	--	0	41	--	3-8	--	62.5	--	--	--	--
1/11/2016	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/14/2016	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/19/2016	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/21/2016	--	22	1.75	271	62	125	20	--	--	17	0	--	--	--	--	--	--	--	--	0	18	--	--	--	--	--	--	--	--
1/22/2016	36	22	1.77	272	60	115	20	--	--	17	0	--	--	--	--	--	--	--	--	0	18	--	--	--	--	--	--	--	--
5/11/2016	62	20	1.78	273	65	125	19	--	--	16	--	--	--	--	--	--	--	--	--	0	16.5	--	--	--	--	--	--	--	--
6/8/2016	75	15	2.00	292	78	130	12	--	--	10	0	--	--	--	--	--	--	--	--	10	0	--	--	--	--	--	--	--	--
7/20/2016	70	15	2.00	292	78	130	12	--	--	10	--	--	--	--	--	--	--	--	--	10	0	--	--	--	--	--	--	--	--
8/17/2016	79	15	2.00	293	82	136	12	--	--	10	0	--	--	--	--	--	--	--	--	10	0	--	--	--	--	--	--	--	--
9/22/2016	62	15	2.00	291	76	128	14	--	--	10	0	--	--	--	--	--	--	--	--	10	0	--	--	--	--	--	--	--	--
10/26/2016	50	18	2.00	291	70	125	12	--	--	12	0	--	--	--	--	--	--	--	--	13	0	--	--	--	--	--	--	--	--
11/30/2016	41	17	2.00	290	70	120	15	--	--	14	0	--	--	--	--	--	--	--	--	14	0	--	--	--	--	--	--	--	--
12/21/2016	22	18	2.00	288	60	114	16	--	--	13	0	--	--	--	--	--	--	--	--	14	0	--	--	--	--	--	--	--	--
2/14/2017	37	25	1.75	272	62	120	23	--	--	0	20	--	--	--	--	--	--	--	--	0	20	--	--	--	--	--	--	--	--
3/6/2017	70	24	0.75	178	62	118	25	--	--	--	20	--	20	--	67	--	--	--	--	--	20	--	18	--	72	--	--	--	--
4/14/2017	65	25	1.75	272	62	116	23	--	--	--	22	--	21	--	61	--	--	--	--	--	21	--	28	--	67	--	--	--	--

Table 1: SVE System Measurements

	SVE-3 Upper Screen Interval (7.95 - 12.95 ft from TOC) Lower Screen Interval (14.95 - 19.45 ft from TOC)										SVE-4 Upper Screen Interval (8.0 - 13.0 ft from TOC) Lower Screen Interval (15.0 - 20.0 ft from TOC)										SVE-5 Upper Screen Interval (7.95 - 12.95 ft from TOC) Lower Screen Interval (14.95 - 19.95 ft from TOC)										
	Manifold Vacuum (in. WC)		Manifold Flow Rate (CFM)[b]		Manifold Temperature (degrees F)		Well Head Vacuum (in. WC)		DTW from TOC		Manifold Vacuum (in. WC)		Manifold Flow Rate (CFM)[b]		Manifold Temperature (degrees F)		Well Head Vacuum (in. WC)		DTW from TOC		Manifold Vacuum (in. WC)		Manifold Flow Rate (CFM)[b]		Manifold Temperature (degrees F)		Well Head Vacuum (in. WC)		DTW from TOC		
Date	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Notes
6/25/2012	--	30	--	13.5	--	83.1	0.26	28	--	19.09	--	29	--	67	--	82.5	0.16	22	--	20.00	--	28	--	115	--	81.5	0.11	7	--	19.93	Initial lower zone testing -- 5 wells
6/25/2012	9	--	41	--	83.2	--	3.5	0.6	19.09	--	9	--	74	--	81.8	--	0.8	0.16	20.00	--	9	--	66	--	81.3	--	1.5	0.1	19.93	--	Initial upper zone testing -- 5 wells
6/27/2012	--	38	--	14	--	68	0.40	37	--	19.09	--	38	--	77	--	68	0.192	30	--	20.00	--	37	--	118	--	68	0.115	9.3	--	19.93	Initial lower zone testing -- 3 wells
6/27/2012	21	--	64	--	73.8	--	7.75	1.45	19.09	--	21	--	109	--	72.7	--	2.30	0.25	20.00	--	21	--	104	--	72.9	--	4.00	0.125	19.93	--	Initial upper zone testing -- 3 wells
7/3/2012	18	--	63	--	76.3	--	7.65	+0.011	18.45	--	19	--	111	--	77.8	--	2.28	0.03	19.32	--	17	--	99	--	78.3	--	3.97	0.132	19.43	--	Extracting from upper zone at SVE-3, SVE-4, SVE-5
7/12/2012	22	--	64.1	--	94.3	--	7.58	0.013	17.20	--	21.2	--	105.2	--	92.6	--	2.36	0.02	18.00	--	21.9	--	98.1	--	92.4	--	3.87	0.288	18.90	--	Extracting from upper zone at SVE-3, SVE-4, SVE-5
8/13/2012																															
8/28/2012																															
9/12/2012	19	--	67.1	--	90.8	--	--	--	--	--	20	--	109.5	--	91.5	--	--	--	--	--	19.5	--	103.7	--	94.2	--	--	--	--	--	
9/25/2012	19	--	24 - 36	--	88.5	--	7.88	--	13.92	--	20	--	28 - 32	--	87	--	2.46	--	14.27	--	19.5	--	28.5 - 30	--	84.2	--	4.07	--	14.80	--	
11/5/2012	21	--	80	--	73.8	--	7.07	--	16.50	--	22	--	115	--	73.8	--	2.52	--	17.37	--	21	--	105	--	73.5	--	4.05	--	17.32	--	
12/11/2012	20	--	70	--	64.0	--	6.80	0.018	dry	--	21	--	108	--	61	--	2.46	0.022	dry	--	21	--	100	--	60.6	--	4.33	0.122	19.60	--	
12/12/2012	21	--	100	--	56.7	--	6.97	0.019	--	--	22	--	115	--	61.4	--	2.50	0.029	--	--	--	20	--	93	--	63	0.110	6.11	--	--	Extracting from upper zone at SVE-3, SVE-4, and lower zone at SVE-5
12/18/2012	19	--	80 - 100	--	72.5	--	6.4	0.021	--	--	19	--	109	--	73.6	--	2.30	0.025	--	--	--	19	--	92 - 99	--	72.6	0.116	5.6	--	--	Pressure transducers in wells; condensation observed in GAC canisters
12/27/2012	19	--	102 - 121	--	59.4	--	6.3	2.35	--	--	19	--	101 - 105	--	59.4	--	2.45	0.326	--	--	--	18	--	85 - 100	--	60.2	0.105	5.7	--	--	
12/28/2012	24	--	--	--	--	--	--	--	--	--	25	--	--	--	--	--	--	--	--	--	--	24	--	--	--	--	--	--	--	--	Drained GAC canisters
1/11/2013	23	--	--	--	--	--	--	--	--	--	24	--	--	--	--	--	--	--	--	--	--	23	--	--	--	--	--	--	--	--	Effluent confirmation sample collected
1/22/2013	20	--	87 - 128	--	64.1	--	6.7	1.57	--	--	20	--	110 - 112	--	61.4	--	2.3	0.291	--	--	--	19	--	87 - 90	--	59.5	0.108	6.6	--	--	
2/21/2013	19	--	115	--	66.2	--	6.5	1.223	--	--	20	--	110	--	64.3	--	2.2	0.269	--	--	--	19	--	90	--	63.8	0.101	5.9	--	--	Collected before draining GAC canisters
2/21/2013	23	--	80	--	67.0	--	7.98	1.5	--	--	23.5	--	120	--	63.4	--	2.6	0.312	--	--	--	23	--	105	--	63.8	0.115	7.0	--	--	Collected after draining GAC canisters
3/12/2013	22	--	80 - 120	--	65.3	--	7.40	1.483	--	dry	22.5	--	116	--	64.3	--	2.49	0.311	--	dry	--	22	--	95	--	64.9	0.116	6.9	--	--	
3/14/2013	23	--	--	--	--	--	--	--	--	--	23.5	--	--	--	--	--	--	--	--	--	--	22.5	--	--	--	--	--	--	--	--	Drained GAC canisters
5/13/2013	22	--	73	--	80	--	8.43	1.32	--	--	22	--	114	--	78.0	--	2.43	0.31	--	--	--	21.5	--	93	--	81	0.11	6.66	--	--	
5/14/2013	20.5	--	66	--	75.0	--	8.176	1.175	--	--	21.5	--	125	--	74.1	--	2.34	0.228	--	--	20	--	112	--	75.1	--	4.14	0.138	--	--	Extracting from upper zone at SVE-3, SVE-4, SVE-5
6/14/2013	21	--	70	--	87.5	--	8.208	1.740	--	--	21	--	113	--	84.7	--	2.34	0.232	--	--	20	--	104	--	86.6	--	4.275	0.136	--	--	
9/19/2013	21.5	--	69	--	83	--	8.745	+0.014	--	--	22	--	113	--	82.7	--	2.51	+0.011	--	--	21	--	107	--	83	--	4.218	0.286	--	--	
11/20/2013	22.5	--	--	--	--	--	7.607	1.331	--	--	23	--	--	--	--	--	2.536	0.259	--	--	22	--	--	--	--	--	4.37	0.130	--	--	Drained GAC canisters
11/21/2013	22	--	--	--	--	--	--	--	--	--	23	--	--	--	--	--	--	--	--	--	22	--	--	--	--	--	--	--	--	--	to push; effluent sample port under positive pressure (at Lag GAC barbed fitting)
12/6/2013	22	--	110	--	70.0	--	7.4	1.19	--	--	22.5	--	120	--	68.8	--	2.50	0.261	--	--	21.5	--	110	--	69.2	--	4.2	0.14	--	--	Pre-modification record; no moisture discharging from effluent stack
12/6/2013	22.5	--	100 - 125	--	62.5	--	7.68	1.36	--	--	23	--	125	--	60.6	--	2.57	0.322	--	--	--	22	--	110	--	60.1	0.133	6.0	--	--	Switched SVE-5 from upper to lower @ 11:25
12/6/2013	--	30	--	14	--	69	0.274	>16	--	--	30	--	--	--	67	--	3.14	0.33	--	--	--	29	--	119 - 128	--	67	0.130	7.6	--	--	Switched SVE-3 from upper to lower @ 13:02
12/6/2013	--	40	--	18	--	63.9	0.380	>16	--	--	--	39	--	87	--	61.1	0.17	>16	--	--	--	39	--	--	--	58.8	0.12	10.12	--	--	Switched SVE-4 from upper to lower @ 14:45; cracked bleed valve to adjuct blower inlet vacuum to 30 in. WC for PID sampling
12/6/2013	--	33	--	16	--	63	0.34	>16	--	--	--	32	--	83	--	62.7	0.17	>16	--	--	--	32	--	125	--	60.1	0.120	--	--	--	Turn on SVE-2 lower zone @16:06
12/6/2013	--	29	--	14	--	64.4	0.3	>16	--	--	--	27	--	70	--	64.7	0.1	>16	--	--	--	28	--	120	--	62.7	0.100	--	--	--	Turn on SVE-1 lower zone @17:17
12/6/2013	2	22.5	--	--	--	--	--	--	--	--	--	21	--	--	--	--	--	--	--	--	--	22	--	--	--	--	--	--	--	--	Switched SVE-3 from lower to upper @18:45 to increase SSD
12/10/2013	24	--	90 - 120	--	70.2	--	8.0	1.3	--	--	--	22.5	--	65 - 95	--	70.4	0.160	17	--	--	--	23.5	--	105 - 115	--	69.2	0.111	6.8	--	--	
1/7/2014	24	1.75	70 - 123	--	68.3	--	7.6	1.12	--	--	--	22	--	65 - 80	--	68.0	0.161	16.6 - 16.9	--	--	--	23	--	105	--	65.9	0.115	6.5	--	--	Water in VLS, transferred to poly tank after measurements (40+ gallons); measurable negative pressure in SVE-3 lower at manifold; small H2O leak at transfer pump head.
2/5/2014	23	0.5	92	--	63.1	--	7.4	1.09	--	--	--	22.5	--	75	--	61.6	0.14	16.6	--	--	--	23	--	100	--	58.0	0.120	6.7	--	--	SVE-1 lower pressure needle bounces around (water in line); unstable readings in SS-1 and SS-2
4/11/2014	24.0	2.0	75	--	75.8	--	8.39	1.362	--	--	--	23	--	66	--	74.9	0.163	>16	--	--	--	24	--	100	--	74.0	0.120	6.0	--	--	
6/5/2014	27	3	80	--	82.2	--	9.41	2.19	--	--	--	26	--	--	--	80.4	0.167	>16	--	--	--	27	--	110	--	81.6	0.105	7.96	--	--	
6/6/2014	10	--	44	--	87.5	--	4.14	0.84	--	--	10	--	74	--	85.6	--	1.35	0.14	--	--	10	--	69	--	86.0	--	2.28	0.09	--	--	Post-modification; changed GAC from push to pull; changed all wells to upper zone; SVE-2 lower zone pressure at 14 in. H2O
9/12/2014	11	--	45	--	83.4	--	4.462	+0.021	--	--	11	--	75	--	83.7	--	1.572	+0.008	--	--	11	--	67	--	83.7	--	3.254	+0.001	--	--	

Table 1: SVE System Measurements

Date	SVE-3 Upper Screen Interval (7.95 - 12.95 ft from TOC) Lower Screen Interval (14.95 - 19.45 ft from TOC)										SVE-4 Upper Screen Interval (8.0 - 13.0 ft from TOC) Lower Screen Interval (15.0 - 20.0 ft from TOC)										SVE-5 Upper Screen Interval (7.95 - 12.95 ft from TOC) Lower Screen Interval (14.95 - 19.95 ft from TOC)										Notes
	Manifold Vacuum (in. WC)		Manifold Flow Rate (CFM)[b]		Manifold Temperature (degrees F)		Well Head Vacuum (in. WC)		DTW from TOC		Manifold Vacuum (in. WC)		Manifold Flow Rate (CFM)[b]		Manifold Temperature (degrees F)		Well Head Vacuum (in. WC)		DTW from TOC		Manifold Vacuum (in. WC)		Manifold Flow Rate (CFM)[b]		Manifold Temperature (degrees F)		Well Head Vacuum (in. WC)		DTW from TOC		
	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	
12/3/2014	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	SVE system off. Overload alarm cleared via reset of relay in control panel. Overload due to ice in hose between lead & lag GAC vessels. Configuration changed from pull to push soil vapor through GAC vessels. Hose placed in groundwater treatement system building to thaw overnight.
12/4/2014	14	--	17	--	62.9	--	1.3	0.27	--	--	13.5	--	90 - 105	--	62.7	--	1.69	0.207	--	--	13	--	95 - 115	--	64.5	--	2.77	0.100	--	18.55	System startup at 0745
12/29/2014	15	--	1.5 - 5.1	--	71.4	--	--	--	--	--	15	--	95 - 113	--	67.8	--	--	--	--	--	14	--	95 - 120	--	67.3	--	--	--	--	--	
1/21/2015	15	--	2 - 6	--	68.8	--	.018 - 0.3	0.06 - 0.10	--	--	15	--	94	--	65.8	--	1.8	0.202	--	--	14.5	--	100 - 122	--	66.2	--	3.4	+0.089	--	--	Pre-modification
1/21/2015	0	38	--	--	--	--	0.24	OL	--	--	0	36	--	--	--	--	0.180	OL	--	--	0	37	--	--	--	--	0.107	12.3	--	--	Post-modification; configuration changed to extract from upper to lower zone
1/22/2015	--	40	--	15	--	74.8	0.344	OL	--	--	--	39	--	--	--	72.8	0.173	OL	--	--	--	40	--	--	--	73.8	0.110	11.78	--	--	Water in VLS, transferred to poly tank after measurements (35 gallons)
1/26/2015	0	23	--	--	--	--	--	--	--	--	0	21.5	--	--	--	--	--	--	--	--	0	23	--	--	--	--	--	--	--	--	Switched SVE-1 and SVE-2 to upper zone to reduce water intake (partially opened); Water in VLS, transferred to poly tank (35 gallons).
3/16/2015	0	24	--	8 - 120	--	67.0	--	--	--	--	0	23	--	55	--	70.1	--	--	--	--	0	24	--	95	--	69.2	--	--	--	--	SVE-3 highly variable flow 8-120 CFM, mostly around 20 CFM; relative humidity was measured in SVE-1 at 29.7%, in SVE-2 at 34.2%, in SVE-3 at 30.0%, in SVE-4 at 27.2%, and in SVE-5 at 29.2%. Relative humidity before the GAC and after the blower was measured at 12.5% and temperature was measured at 120 degrees F.
5/6/2015	0.25	23	0.75	13.5	79.1	79.9	0.245	OL > 16	--	--	0.15	21	0.95	62	78	77.1	0.15	17.11	--	--	0.095	22	0.6	85	73.7	76.1	0.139	6.82	--	--	System set up to push through GAC. SVE-1 and SVE-2 valve @ 50%. SVE-3 lower drop pipe appears skewed.
5/6/2015	0.25	22	0.62	15	73.4	71.4	0.24	20			0.15	20	0.7	45	72.7	72.7	0.15	16.79			0.095	20.5	0.55	82	72.1	72.8	0.15	6.75			System changed to pull through GAC units. SVE-1 and SVE-2 valve @ 50%
5/6/2015	0.378	40	0.9	25	77	74.9	0.383	36			0.188	38	0.7	72	73.4	74.1	0.202	29			0.112	39	0.8	116	72.9	74.1	0.124	10.73			SVE-1 and SVE-2 closed. SVE-3, SVE-4, SVE-5 lower zones 100% open.
5/7/2015	0.395	40	14	23	84.3	77.1	0.38	36.5			0.228	38.0	0.93	81.2	77.1	76.8	0.19	29			0.157	39	0.27	114	76	76.6	0.114	10.61			SVE-3, SVE-4, SVE-5 only, 100% open.
5/7/2015	0.453	>60	1.2	OL	86.6	81.7	0.45	54			0.12	18.0	0.27	44	77.9	81.2	0.091	15.05			0.08	20	0.57	76	78.7	80.4	0.082	5.918			SVE-4 and SVE-5 50% open. SVE-3 100% open.
6/24/2015	11.4	0.26	39	0	--	--	0.02+	8.4	--	--	11.2	0.055+	76	0.35	--	--	1.61	0	--	--	11.2	0.098	67	0.9	--	--	2.81	0.08	--	--	Prior to switching all to upper zone.
6/25/2015	10.86	0.43	31	0.37	--	--	2.4	0.44	--	--	10.6	0.033	76	0.62	--	--	2.74	0	--	--	10.7	0.08	66	0.34	--	--	1.57	0.18	--	--	After switching to the upper zone
9/25/2015	11.5	--	16.2	--	87.9	--	--	--	--	--	11.5	--	62	--	83.4	--	--	--	--	--	11	--	57.8	--	83.5	--	--	--	--	--	
1/7/2016	15	0	5	--	69.1	--	--	--	--	--	14	0.0	83	--	67.1	--	--	--	--	--	14	0	98	--	67.5	--	--	--	--	--	Pre-modification
1/8/2016	0	41	--	10	--	61.7	--	--	--	--	0	40	--	NM	--	60.4	--	--	--	--	0	40	--	NM	--	60.5	--	--	--	--	Post-modification; configuration changed to extract from upper to lower zone
1/11/2016	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Drained 120 gallons of water from VLS.
1/14/2016	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Drained 100 gallons of water from VLS.
1/19/2016	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Drained 145 gallons of water from VLS.
1/21/2016	1	19	--	--	--	--	--	--	--	--	18	0	--	--	--	--	--	--	--	--	0	18	--	--	--	--	--	--	--	--	Too much moisture collecting in VLS, Switched SVE-1 and SVE-4 to upper zone.
1/22/2016	0	19	--	--	--	--	--	--	--	--	19	0	--	--	--	--	--	--	--	--	0	19	--	--	--	--	--	--	--	--	5 gallons of water in VLS.
5/11/2016	0	17	--	--	--	--	--	--	--	--	17	--	--	--	--	--	--	--	--	--	0	17	--	--	--	--	--	--	--	--	Pre-modification; switched SVE-2, SVE-3, and SVE-5 to upper zone.
6/8/2016	11	0	--	--	--	--	--	--	--	--	10	0	--	--	--	--	--	--	--	--	10	0	--	--	--	--	--	--	--	--	
7/20/2016	11	0	--	--	--	--	--	--	--	--	10	0	--	--	--	--	--	--	--	--	10	1	--	--	--	--	--	--	--	--	
8/17/2016	12	0	--	--	--	--	--	--	--	--	10	0	--	--	--	--	--	--	--	--	10	1	--	--	--	--	--	--	--	--	
9/22/2016	12	0	--	--	--	--	--	--	--	--	10	0	--	--	--	--	--	--	--	--	10	0	--	--	--	--	--	--	--	--	
10/26/2016	15	0	--	--	--	--	--	--	--	--	14	0	--	--	--	--	--	--	--	--	14	0	--	--	--	--	--	--	--	--	
11/30/2016	15	0	--	--	--	--	--	--	--	--	14	0	--	--	--	--	--	--	--	--	14	0	--	--	--	--	--	--	--	--	
12/21/2016	15	0	--	--	--	--	--	--	--	--	14	0	--	--	--	--	--	--	--	--	14	0	--	--	--	--	--	--	--	--	Pre-modification; switched all wells to lower zone.
2/14/2017	0	22	--	--	--	--	--	--	--	--	22	20	--	--	--	--	--	--	--	--	0	22	--	--	--	--	--	--	--	--	
3/6/2017	--	20	--	1 - 2	--	68	--	--	--	--	19	21	102	50	69	69	--	--	--	--	--	20	--	78	--	71	--	--	--	--	
4/14/2017	--	23	--	4	--	62	--	--	--	--	22	20	109	90	67	65	--	--	--	--	--	21	--	86	--	67	--	--	--	--	Pre-modification measurtements, before GAC exchange. Similar measurements were observed after system restart.

Notes:

(a) Total Flow Rate (CFM) - estimated, based on measurements collected at the blower inlet [in inches water column (in. WC)].

(b) Manifold Flow Rate (CFM) - measured using hot wire anemometer.

F = Fahrenheit
CFM = cubic feet per minute
TOC = top of casing
ft = feet
H2O = water

NM = not measured
psi = pounds per square inch
GAC = granular activated carbon
DTW = depth to water
PID = photoionization detector

VLS = vapor liquid separator
SSD = subslab depressurization

Table 2: Subslab Measurements

	Pressure (in. WC)				
Date	**BMS-SS-1**	**BMS-SS-2**	**BMS-SS-3**	**BMS-SS-4**	**BMS-SS-5**
6/25/2012	-0.036	-0.168	-0.047	-0.040	-0.022
6/25/2012	-0.054	-0.110	-0.043	-0.060	-0.035
6/27/2012	-0.037	-0.111	-0.036	-0.044	-0.025
6/27/2012	-0.065	-0.115	-0.057	-0.050	-0.030
7/3/2014	-0.066	-0.115	-0.050	-0.043	-0.033
7/12/2014	-0.078	-0.131	-0.063	-0.059	-0.043
9/12/2012	-0.110	-0.162	-0.087	-0.079	-0.062
9/25/2012	-0.072	--	--	-0.056	--
11/5/2012	-0.064	-0.112	-0.042	-0.038	-0.025
12/11/2012	-0.055	-0.104	-0.039	-0.031	-0.022
12/12/2012	-0.031	-0.079	-0.029	-0.030	-0.019
12/18/2012	-0.030	-0.079	-0.029	-0.029	-0.020
12/27/2012	-0.029	-0.074	-0.028	-0.028	-0.019
1/22/2013	-0.026	-0.069	-0.024	-0.023	-0.018
3/12/2013	-0.037	-0.083	-0.033	-0.033	-0.019
5/13/2013	-0.050	-0.090	-0.045	-0.045	-0.030
5/14/2013	-0.075	-0.115	-0.047	-0.041	-0.031
6/14/2013	-0.072	-0.118	-0.049	-0.059	-0.027
9/19/2013	-0.061	-0.122	-0.054	-0.049	-0.032
11/20/2013	-0.040	-0.090	-0.035	-0.024	-0.017
11/21/2013	-0.040	-0.085	-0.031	--	-0.016
12/6/2013	-0.037	-0.083	-0.028	-0.018	-0.013
12/6/2013	-0.011	-0.060	-0.021	-0.018	-0.014
12/6/2013	0.000 - -0.020	-0.060	-0.020	-0.015	-0.010
12/6/2013	+0.012	-0.031	-0.015	-0.011	-0.003
12/6/2013	+0.010	-0.024	-0.009	-0.009	-0.008
12/6/2013	+0.020	-0.025	-0.013	-0.010	-0.010
12/6/2013	+0.040 to -0.010	-0.030 to 0.048	-0.015	-0.007 to -0.014	-0.011
12/10/2013	-0.012	-0.042	-0.017	-0.014	-0.012
1/7/2014	-0.015	-0.042	-0.017	-0.017	-0.012
2/5/2014	-0.008	-0.040	-0.015	-0.014	-0.014
4/11/2014	-0.019	-0.024	-0.049	-0.025	-0.014
6/5/2014	-0.027	-0.059	-0.024	-0.033	-0.022
6/6/2014	-0.044	-0.075	-0.028	-0.032	-0.015
9/12/2014	-0.050	-0.096	-0.036	-0.035	-0.025
12/3/2014	--	--	--	--	--
12/4/2014	-0.032	--	-0.021	-0.014	-0.009
12/29/2014	--	--	--	--	--
1/21/2015	-0.034	--	-0.020	-0.010	-0.009
1/21/2015	--	--	--	--	--
1/22/2015	-0.017	--	-0.015	-0.019	-0.011
1/26/2015	--	--	--	--	--
3/16/2015	-0.017	-0.042	-0.015	-0.016	-0.010
5/6/2015	-0.029	-0.041	-0.017	AB	-0.022
5/6/2015	-0.018	-0.047	-0.017	--	-0.034
5/6/2015	-0.025	-0.055	-0.022	--	-0.021
5/7/2015	--	--	--	--	--
6/24/2015	-0.028	-0.054	-0.029	--	-0.028
6/24/2015	-0.045	-0.036	-0.083	--	-0.029
6/25/2015	-0.050	-0.084	-0.037	--	-0.043
9/25/2015	-0.039	-0.080	-0.028	--	-0.025
1/7/2016	-0.036	-0.073	-0.017	--	-0.010
1/8/2016	-0.019	-0.041	-0.013	--	-0.010
1/21/2016	--	--	--	--	--
1/22/2016	-0.019	-0.060	-0.016	--	-0.015
5/11/2016	-0.029	-0.066	-0.021	--	-0.019
6/8/2016	-0.029	-0.087	-0.032	--	-0.048
7/20/2016	-0.047	-0.088	-0.034	--	-0.029
8/17/2016	-0.054	-0.093	-0.039	--	-0.029
9/22/2016	-0.036	-0.078	-0.027	--	-0.021
10/26/2016	--	-0.083	-0.024	--	-0.013
11/30/2016	-0.033	-0.074	-0.020	--	-0.008
12/21/2016	-0.036	-0.067	-0.019	--	-0.008
2/14/2017	-0.013	-0.079	-0.021	--	-0.027
3/6/2017	-0.032	-0.076	-0.022	--	-0.016
4/14/2017	-0.036	-0.078	-0.024	--	-0.016

Notes:

Subslab monitoring points are measured for pressure using Fluke 922 Micromanometer.
in. WC = inches water column
AB = ABANDONED. Location SS-4 was abandoned in March 2015 and not re-installed.

Table 3: Remediation System Analytical Data

			Removal Efficiency for Tetrachloro-ethene	Tetrachloro-ethene	Chloroform	Benzene	1,2-Dichloro-ethane	Trichloro-ethene	Toluene	Ethyl-benzene	m,p-Xylene	o-Xylene	Vinyl chloride	Methylene chloride	trans-1,2-Dichloro-ethene	cis-1,2-Dichloro-ethene
Soil Vapor Screening Level [(a)]				***962***	***11***	***32***	***9.6***	***37***	***228,571***	***45,714***	***4,571***	***4,571***	***28***	***25,000***		
Influent	**SVE-Influent-123**	**1/8/2016**	--	**4,800**	**10**	<3.2	<4.1	**310**	<3.8	<4.4	<8.8	<4.4	**5.0**	<3.5	<8.0	**340**
	FW-Influent-090	**4/14/2017**	--	**260**	**7.4**	**9.3**	**14**	**7.6**	**350**	**8.5**	**32**	**11**	<2.6	**29**	<8.0	<4.0
Soil Vapor Screening Level [(a)]				**962**	**11**	**32**	**9.6**	**37**	**228,571**	**45,714**	**4,571**	**4,571**	**28**	**25,000**		
Influent SVE-1 (Lower Zone)	**SVE-1 low-107** [(b)]	**1/8/2016**	--	**420**	<190	<190	<190	<190	<1,900	<960	<960	<960	<100	<960	<960	<960
Influent SVE-2 (Lower Zone)	**SVE-2 low-384**	**1/8/2016**	--	**17,000**	**27**	<16	<21	**1,400**	<19	<22	<44	<22	**31**	<18	<40	**1,700**
Influent SVE-3 (Lower Zone)	**SVE-3 low-047**	**1/8/2016**	--	**910**	**6.6**	**90**	<4.1	**160**	**35**	<4.4	<8.8	<4.4	<2.6	<3.5	<8.0	**250**
Influent SVE-4 (Lower Zone)	**SVE-4 low-132** [(b)]	**1/8/2016**	--	**890**	<200	<200	<200	<200	<2,000	<980	<980	<980	<100	<980	<980	<980
Influent SVE-5 (Lower Zone)	**SVE-5 low-318**	**1/8/2016**	--	**6,100**	<25	<16	<21	**430**	<19	<22	<44	<22	<13	<18	<40	**490**
Midpoint	**SVE-Inbetween-292**	**1/8/2016**	--	**690**	<4.9	**13**	<4.1	**42**	**10**	<4.4	**8.8**	<4.4	**4.5**	<3.5	<8.0	**60**
	FW-Btwn-249	**4/14/2017**	--	<6.9	<4.9	<3.2	<4.1	<5.5	<3.8	<4.4	<8.8	<4.4	<2.6	<3.5	<8.0	<4.0
Effluent	**SVE-effluent-368** [(b)]	**1/8/2016**	*96.3%*	<180	<180	**410**	<180	**360**	<1,800	<880	<880	<880	<90	<880	<880	<880
	FW-Effluent-005	**6/8/2016**	--	<6.9	<4.9	**110**	<4.1	**210**	7.1	<4.4	<8.8	<4.4	<2.6	<3.5	8	120
	FW-Effluent-150	**4/14/2017**	*97.3%*	<6.9	<4.9	**4.3**	<4.1	<5.5	**4.2**	<4.4	<8.8	<4.4	<2.6	<3.5	<8.0	<4.0

Notes:

(a) Screening levels calculated by multiplying MTCA Method B indoor air cleanup levels by 100 times attenuation, as noted in Ecology's *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action; Review Draft, October 2009.*

(b) Samples were analyzed by Modified EPA Method 8260B.

All units are in micrograms per cubic meter ($\mu g/m^3$), unless otherwise noted.

Detected concentrations are shown in **boldface.**

Table 4: Cumulative Mass Removal

Date	Approximate Blower Inlet Flow Rate (CFM)[a]	Total Blower Operation (days)[b]	Total Influent VOC Concentration (µg/m^3)[c]	Average Influent VOC Concentration (µg/m^3)[d]	Influent PCE Concentration (µg/m^3)	Average Influent PCE Concentration (µg/m^3)[e]	Mid-Point PCE Concentration (µg/m^3)	Effluent PCE Concentration (µg/m^3)	Influent Benzene Concentration (µg/m^3)	Mid-Point Benzene Concentration (µg/m^3)	Effluent Benzene Concentration (µg/m^3)	Time Period Blower Operation (days)[f]	Time Period VOC Mass Removed (pound)[g]	Time Period PCE Mass Removed (pound)[g]	Cumulative VOC Mass Removed (pound)[h]	Cumulative PCE Mass Removed (pound)[h]
7/3/2012	249	0	8,021	0	7,700	0	-	-	92	-	-	0	0.00	0.00	0.00	0.00
7/12/2012	258	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7/30/2012		27	769	4,395	260	3,980	-	-	-	-	-	27	0.00	0.00	0.00	0.00
8/13/2012		41	243	506	110	185	-	-	-	-	-	14	0.00	0.00	0.00	0.00
8/28/2012	212	56	680	461	380	245	-	-	-	-	-	15	0.13	0.07	0.13	0.07
9/12/2012	280	71	607	643	260	320	-	-	-	-	-	15	0.24	0.12	0.37	0.19
9/25/2012	353	84	322	464	210	235	-	-	-	-	-	13	0.19	0.10	0.57	0.29
11/5/2012	253	125	699	511	570	390	6.9	*6.9*	39	330	*3.2*	41	0.48	0.36	1.04	0.65
12/11/2012	256	161	1,800	1,250	1,800	1,185	-	-	-	-	-	36	1.03	0.98	2.07	1.63
12/12/2012	235	162	12,000	6,900	12,000	6,900	-	-	-	-	-	1	0.15	0.15	2.22	1.78
12/18/2012	231	168	11,000	11,500	11,000	11,500	-	-	-	-	-	6	1.43	1.43	3.65	3.21
12/27/2012	265	177	3,200	7,100	3,200	7,100	1,300	96		*100*	45	9	1.52	1.52	5.17	4.72
12/28/2012	270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/11/2013	247	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/22/2013	235	203	9,900	6,550	9,900	6,550	-	350	-	-	63	26	3.59	3.59	8.76	8.31
2/21/2013	261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2/21/2013	263	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/12/2013	271	252	16,031	12,966	16,000	12,950	5,700	3,000	31	75	230	49	15.44	15.43	24.20	23.74
5/13/2013	277	314	12,103	14,067	12,000	14,000		190	30		460	62	21.67	21.57	45.87	45.31
5/14/2013		315	2,146	7,125	2,000	7,000		550	28		440	1	0.00	0.00	45.87	45.31
6/14/2013	281	346	920	1,533	850	1,425	28	13	39	430	440	31	1.20	1.11	47.07	46.42
9/19/2013	281	443	250	585	180	515	6.9	8.5	24	250	470	97	1.43	1.26	48.50	47.68
11/21/2013	275	506	2,640	1,445	2,600	1,390	-	100	21	-	420	63	2.25	2.16	50.75	49.84
11/21/2013	269	506	2,145	2,392	2,100	2,350	-	550	27		*3.2*	0	0.00	0.00	50.75	49.84
12/6/2013	268	521	2,900	2,522	2,900	2,500	-	-	*100*			15	0.91	0.90	51.66	50.74
12/10/2013	265	525	14,000	8,450	14,000	8,450	6.9	*6.9*	*100*	17	*3.2*	4	0.80	0.80	52.46	51.55
1/7/2014	264	553	11,000	12,500	11,000	12,500	10	*6.9*	*100*	*3.2*	*3.2*	28	8.29	8.29	60.75	59.84
2/5/2014	265	582	5,200	8,100	3,900	7,450	100	*6.9*	*100*	*100*	12	29	5.58	5.14	66.33	64.97
4/11/2014	261	647	15,800	10,500	14,000	8,950	100	*6.9*	*100*	*100*	15	65	15.98	13.62	82.31	78.59
6/5/2014	255	702	13,440	14,620	12,000	13,000		*6.9*	*100*	*100*	210	55	18.39	16.36	100.71	94.95
6/6/2014	298	703	25,480	19,460	23,000	17,500	1,200	11	*100*	*100*	710	1	0.52	0.47	101.23	95.42
9/12/2014	321	801	2,162	13,821	630	11,815	5.5	*6.9*	7.5	20	340	98	39.00	33.34	140.23	128.76
12/4/2014	282	884	33,815	17,988	20,000	10,315	18,000	*6.9*	16.0	7	3	83	37.77	21.66	178.00	150.42
1/22/2015	231	933	20,510	27,163	16,000	18,000	120.0	*6.9*	16.0	7	3	49	27.58	18.28	205.58	168.70
3/16/2015	262	986	9,139	14,825	7,900	11,950	230.0	*25.0*	6.5	3	5	53	18.47	14.89	224.05	183.58
5/6/2015	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/6/2015	215	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/6/2015	217	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/7/2015	219	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/7/2015	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6/24/2015	265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6/25/2015	275	1,087	5,804	7,472	4,200	6,050	2,100	*21.0*	6.9	13	550	101	18.62	15.07	242.66	198.66
9/25/2015	263	1,179	5,723	5,764	4,000	4,100	12,000	*6.9*	13	150	590	92	12.51	8.90	255.17	207.56
1/7/2016	281	1,283	-	-	-	-	-	-	-	-	-	104	-	-	-	-
1/8/2016	236	1,284	5,465	5,594	4,800	4,400	690	*180*	*3.2*	13	410	1	12.44	9.78	267.61	217.34
1/11/2016	--	1,287	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/14/2016	--	1,290	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/19/2016	--	1,295	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/21/2016	271	1,297	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/22/2016	272	1,298	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/11/2016	273	1,408	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6/8/2016	292	1,436	-	-	-	-	-	*6.9*	-	-	110	-	-	-	-	-
7/20/2016	292	1,478	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8/17/2016	293	1,506	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9/22/2016	291	1,542	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/26/2016	291	1,576	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11/30/2016	290	1,611	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12/21/2016	291	1,632	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2/14/2017	272	1,687	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/6/2017	178	1,707	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/14/2017	272	1,746	729	3,097	260	2,530	*6.9*	*6.9*	9.3	*3.2*	4.3	462	34.91	28.52	302.52	245.86

Notes:

(a) Total Flow Rate [cubic feet per minute (CFM)] - estimated, based on measurements collected at the blower inlet (in inches water column).
(b) Blower Operation (days) - total days of soil vapor extration (SVE) blower operation at time of system monitoring and sampling.
(c) Total Influent VOC Concentration - sum of detected volatile organic compound (VOC) constituents (see Table 4).
(d) Average Influent VOC Concentration - average concentration of VOCs between monitoring and sampling events.
(e) Average Influent PCE Concentration - average concentration of tetrachloroethene (PCE) between monitoring and sampling events.
(f) Time Period Blower Operation (days) - time period between monitoring and sampling events.
(g) Time Period Mass Removed (pound) - mass removed between monitoring and sampling events.
(h) Cumulative Mass Removed (pound) - mass removed cumulatively over operational period.

Conversions	
CFM to CFD	1440
cubic meter to cubic feet	35.3147
micrograms to pounds	2.2E-09

Laboratory Anaytical Data
Averaged Data
Non-detect values shown in italics, set at reporting limit.

µg/m^3 = micrograms per cubic meter
CFM = cubic feet per minute

Table 5: Indoor and Ambient Air Analytical Data

Location	Sample ID	Date	Tetrachloro-ethene	Chloroform	Benzene	1,2-Dichloro-ethane	Trichloro-ethene	Toluene	Ethyl Benzene	m,p-Xylene	o-Xylene	Methylene Chloride	trans-1,2-Dichloro-ethene	Vinyl Chloride	cis-1,2-Dichloro-ethene
MTCA Method B Indoor Air Cleanup Level[a]			*9.6*	*0.11*	*0.32*	*0.096*	*0.37*	*2,286*	*457*	*45.7*	*45.7*	*250*		*0.28*	
Upstairs (Kitchen)	BMS-U1-092411	9/25/2011	5.7	1.3		<0.17	<0.22								<0.16
	BMS-U1-102011	10/20/2011	6.1	2.9		<0.14	0.086								<0.13
NE Corner Nap/ Play Area	BMS-M1-092411	9/25/2011	6.3	1.4		0.15	<0.19								<0.14
	BMS-M1-102011	10/20/2011	6.0	2.3		<0.14	0.08								<0.14
	BMS-M1-070612	7/6/2012	0.29	2.9		0.34	0.071								<0.15
	BMS-M1-081312	8/13/2012	<0.25	1.8	0.50	0.25	0.083	3.8	0.30	0.78	0.33	<1.3	<0.74	<0.048	<0.15
	BMS-M1-091212	9/12/2012	<0.24	1.2	4.4	<0.14	0.058	3.8	0.34	1.2	0.42	<1.2	<0.71	<0.046	<0.14
	BMS-M1-110512	11/5/2012	0.37	2.7	2.1	0.26	0.11	9.9	1.3	4.3	1.5	<1.3	<0.74	<0.048	<0.15
	BMS-M1-031213	3/12/2013	1.7	1.5	1.0	0.21	0.065	5.4	0.55	1.8	0.64	7.0	<0.72	<0.047	<0.14
	BMS-M1-061413	6/14/2013	<0.25	2.3	0.34	<0.15	<0.029	1.3	0.33	0.70	0.27	<1.3	<0.72	<0.046	<0.14
	BMS-M1-091913	9/19/2013	0.24	2.4	0.48	0.16	0.055	3.2	0.30	0.87	0.32	<1.2	<0.69	<0.044	<0.14
	BMS-M1-121013	12/10/2013	0.24	<0.74	1.9	<0.12	0.033	4.5	1.0	2.1	0.75	<1.0	<0.60	<0.039	<0.12
	BMS-M1-041114	4/11/2014	1.3	<0.87	0.39	<0.14	0.033	1.3	0.16	0.49	0.16	<1.2	<0.71	<0.046	<0.14
	BMS-M1-060614	6/6/2014	1.8	1.1	<0.28	<0.14	0.071	1.4	0.15	0.42	0.16	<1.2	<0.70	<0.045	<0.14
	BMS-M1-091214	9/12/2014	2.8	5.4	0.62	<0.14	0.071	1.8	0.20	0.58	0.25	<1.2	<0.67	<0.043	0.48
	BMS-M1-120414	12/4/2014	0.28	2.0	1.3	<0.14	0.066	4.2	0.50	1.7	0.62	<1.2	<0.69	0.070	<0.14
	BMS-M1-031615	3/16/2015	0.62	1.7	0.59	<0.14	0.056	2.0	0.24	0.80	0.29	<1.2	<0.67	<0.043	0.16
	BMS-M1-062415	6/24/2015	0.52	<0.86	0.32	<0.14	0.13	1.3	1.8	5.3	1.2	<1.2	<0.70	<0.045	1.8
	BMS-M1-092515	9/25/2015	0.70	1.3	0.79	0.83	0.13	4.3	1.6	4.7	1.2	<1.3	<0.72	<0.046	0.51
	BMS-M1-010716	1/7/2016	0.74	0.86	2.8	0.64	0.11	9.6	3.1	9.3	2.7	<0.95	<0.54	<0.035	<0.11
	BMS-M1-041417	4/14/2017	<0.25	1.6	0.77	<0.15	<0.050	2.2	0.31	1.0	0.49	<1.3	<0.74	<0.048	<0.15
Reception Desk	BMS-M2-092411	9/25/2011	6.2	1.3		<0.14	0.27								<0.14
	BMS-M2-102011	10/20/2011	6.2	2.4		<0.15	0.083								<0.14
SE Corner Nap/ Play Area	BMS-M3-092411	9/25/2011	6.6	1.3		0.15	<0.18								<0.13
	BMS-M3-102011	10/20/2011	6.5	2.7		<0.14	0.085								<0.14
	BMS-M3-070612	7/6/2012	0.25	2.7		0.33	0.067								<0.14
	BMS-M3-081312	8/13/2012	<0.25	1.8	0.46	0.23	0.077	3.8	0.26	0.75	0.30	<1.3	<0.74	<0.048	<0.15
	BMS-M3-091212	9/12/2012	<0.24	1.1	1.0	<0.14	0.032	2.8	0.31	1.0	0.35	<1.2	<0.71	<0.046	<0.14
	BMS-M3-110512	11/5/2012	0.56	2.9	2.6	0.30	0.13	12	1.5	5.0	1.8	1.9	<0.69	<0.045	<0.14
	BMS-M3-031213	3/12/2013	2.5	1.2	1.0	0.20	0.065	5.8	0.57	1.8	0.64	13	<0.74	<0.048	<0.15
	BMS-M3-061413	6/14/2013	<0.19	1.9	0.28	0.12	<0.022	1.4	0.60	1.9	0.66	<0.96	<0.55	<0.035	<0.11
	BMS-M3-091913	9/19/2013	0.57	2.1	0.54	0.20	0.52	5.4	0.50	1.3	0.51	1.8	<0.66	<0.042	<0.13
	BMS-M3-121013	12/10/2013	1.1	<0.75	1.8	0.16	0.054	17	1.4	3.4	1.2	2.7	<0.61	<0.039	<0.12
	BMS-M3-041114[b]	4/11/2014	1.2	<0.90	0.37	<0.15	0.031	1.2	<0.16	0.45	0.16	<1.3	<0.73	<0.047	<0.14
	BMS-M3-060614	6/6/2014	1.6	0.93	<0.28	<0.14	0.062	1.5	0.17	0.43	0.17	<1.2	<0.70	<0.046	<0.14
	BMS-M3-091214	9/12/2014	3.6	2.8	0.78	<0.11	0.086	1.8	0.20	0.58	0.19	<0.94	<0.54	<0.035	0.50
	BMS-M3-120414	12/4/2014	0.29	1.8	1.3	<0.14	0.075	4.2	0.53	1.8	0.64	<1.2	<0.69	0.086	<0.14
	BMS-M3-031615	3/16/2015	0.62	1.5	0.61	0.16	0.080	3.9	0.34	0.98	0.35	<1.1	<0.64	<0.041	0.14
	BMS-M3-062415	6/24/2015	0.59	<0.81	0.28	<0.13	0.14	1.2	2.1	6.1	1.4	<1.2	<0.66	<0.042	2.3
	BMS-M3-092515	9/25/2015	0.69	1.4	0.78	0.86	0.13	4.2	1.6	4.6	1.2	<1.4	<0.78	<0.050	0.38
	BMS-M3-010716	1/7/2016	0.74	0.93	2.8	0.65	0.13	9.4	3.1	9.2	2.7	<0.94	<0.54	<0.035	<0.11
	BMS-M3-041417	4/14/2017	<0.26	1.4	0.73	<0.16	<0.052	2.1	0.32	1.0	0.46	<1.3	<0.76	<0.049	<0.15

Table 5: Indoor and Ambient Air Analytical Data

Location	Sample ID	Date	Tetrachloro-ethene	Chloroform	Benzene	1,2-Dichloro-ethane	Trichloro-ethene	Toluene	Ethyl Benzene	m,p-Xylene	o-Xylene	Methylene Chloride	trans-1,2-Dichloro-ethene	Vinyl Chloride	cis-1,2-Dichloro-ethene
MTCA Method B Indoor Air Cleanup Level [(a)]			***9.6***	***0.11***	***0.32***	***0.096***	***0.37***	***2,286***	***457***	***45.7***	***45.7***	***250***		***0.28***	
Upwind Ambient Air	**AMB-UPWIND-092411**	**9/25/2011**	<0.23	<0.84		<0.14	<0.18								<0.14
	AMB-UPWIND-070612	**7/6/2012**	<0.26	<0.94		<0.16	**0.048**								<0.15
	AMB-UPWIND-081312	**8/13/2012**	<0.27	<0.98	**0.40**	<0.16	**0.068**	**1.1**	**0.20**	**0.46**	**0.17**	<1.4	<0.80	<0.051	
	AMB-UPWIND-091212	**9/12/2012**	<0.25	<0.89	**0.64**	<0.15	<0.030	**1.6**	**0.19**	**0.58**	**0.22**	<1.3	<0.72	<0.047	<0.14
	AMB-UPWIND-110512	**11/5/2012**	**0.45**	<0.91	**2.3**	<0.15	**0.11**	**8.8**	**1.3**	**4.5**	**1.6**	<1.3	<0.74	<0.048	<0.15
	AMB-UPWIND-031213	**3/12/2013**	**70**	<1.8	**1.3**	**1.5**	**0.22**	**53**	**1.9**	**4.5**	**1.6**	**410**	<1.4	<0.093	<0.29
	AMB-UPWIND-061413	**6/14/2013**	<0.25	<0.90	**0.32**	<0.15	<0.030	**1.7**	**0.71**	**2.4**	**0.84**	<1.3	<0.73	<0.047	<0.15
	AMB-UPWIND-091913	**9/19/2013**	<0.26	<0.92	**0.35**	<0.15	<0.030	**1.8**	**0.24**	**0.71**	**0.25**	<1.3	<0.74	<0.048	<0.15
	AMB-UPWIND-121013	**12/10/2013**	<0.21	<0.77	<0.25	<0.13	<0.025	<0.12	<0.14	<0.27	<0.14	<1.1	<0.63	<0.040	<0.12
	AMB-UPWIND-041114	**4/11/2014**	**5.6**	<0.91	**0.36**	<0.15	**0.088**	**0.75**	<0.16	**0.38**	<0.16	<1.3	<0.74	<0.048	<0.15
	AMB-UPWIND-060614	**6/6/2014**	**4.1**	<0.92	<0.30	<0.15	**0.12**	**0.80**	<0.16	**0.33**	<0.16	<1.3	<0.74	<0.048	**0.18**
	AMB-UPWIND-091214	**9/12/2014**	**4.1**	<0.83	**0.48**	<0.14	**0.086**	**1.1**	**0.16**	**0.51**	**0.17**	<1.2	<0.67	<0.043	**0.48**
	AMB-UPWIND-120414	**12/4/2014**	<0.24	<0.85	**1.2**	<0.14	**0.053**	**3.6**	**0.55**	**1.9**	**0.67**	<1.2	<0.69	**0.067**	**0.21**
	AMB-UPWIND-031615	**3/16/2015**	**1.5**	<0.79	**0.54**	<0.13	**0.11**	**1.3**	**0.22**	**0.71**	**0.26**	<1.1	<0.64	**0.065**	**0.22**
	AMB-UPWIND-062415	**6/24/2015**	**0.70**	<0.86	<0.28	<0.14	**0.16**	**1.2**	**0.28**	**0.95**	**0.33**	<1.2	<0.70	<0.045	**0.47**
	AMB-UPWIND-092515	**9/25/2015**	**0.71**	<1.0	**0.66**	<0.16	**0.12**	**3.0**	**0.42**	**1.4**	**0.51**	<1.4	<0.81	<0.052	**0.26**
	AMB-UPWIND-010716	**1/7/2016**	**1.3**	<0.81	**2.5**	<0.13	**0.34**	**8.5**	**1.4**	**4.8**	**1.8**	<1.2	<0.66	<0.042	**<0.13**
	AMB-UPWIND-041417	**4/14/2017**	<0.18	<0.64	**0.82**	**0.10 J**	**0.14**	**2.2**	**0.26**	**0.93**	**0.36**	<0.92	<0.52	<0.034	<0.10
Upwind Ambient Air along North Wall	**AMB-NWALL-092411**	**9/25/2011**	<0.25	<0.90		<0.15	<0.20								<0.14

Notes:
(a) MTCA Method B Indoor Air Cleanup Level, published in Ecology's Cleanup Levels and Risk Calculations (CLARC) database as of December 2014.
(b) Analytical laboratory report uses an incorrect field sample name, "BMS-M2-041114".

All units are in micrograms per cubic meter ($\mu g/m^3$), unless otherwise noted.
Detected concentrations are shown in **boldface.**
"J" denotes an estimated concentration.

Laboratory reporting limit above MTCA Method B Indoor Air Cleanup Level.

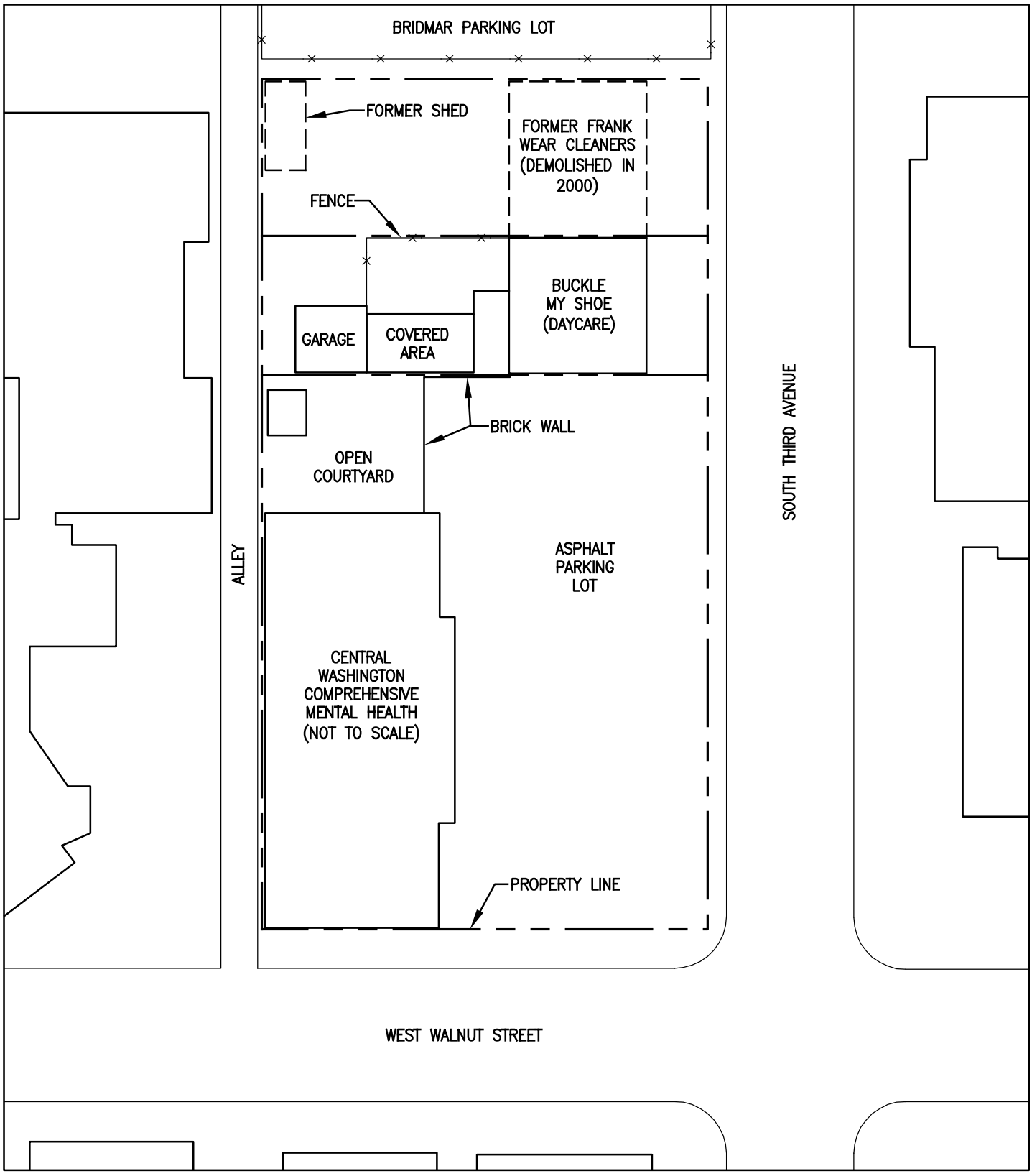
Table 6: Subslab Soil Vapor Analytical Data

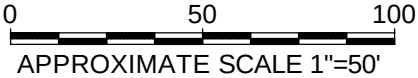
Location	Sample ID	Date	Helium[b] (%)	Tetrachloro-ethene	Chloroform	Benzene	1,2-Dichloro-ethane	Trichloro-ethene	Toluene	Ethyl-benzene	m,p-Xylene	o-Xylene	Vinyl chloride	Methylene chloride	trans-1,2-Dichloro-ethene	cis-1,2-Dichloro-ethene
Subslab Soil Vapor Screening Level[a]			*NA*	*321*	*3.6*	*10.7*	*3.2*	*12.3*	*76,190*	*15,238*	*1,524*	*1,524*	*9.3*	*8,333*		
NE Corner Nap/ Play Area	BMS-SS-1-092511	9/25/2011	<1.0	**3,600**	**7.5**	<3.2	<4.1	<5.5	**11**	<4.4	<8.8	<4.4	<2.6	<3.5	<8.0	<4.0
	BMS-SS-1-081312	8/13/2012	**0.8**	**450**	<0.49	**0.47**	<0.82	<1.1	**2.7**	<0.88	**2.8**	**1.1**	<0.26	**0.97**	<0.80	<0.80
	BMS-SS-1-091212	9/12/2012	**0.2**	**57**	**1.9**	**4.3**	<0.82	<1.1	**29**	**6.1**	**21**	**7.6**	<0.26	**8.5**	<0.80	<0.80
	BMS-SS-1-110512	11/5/2012	**0.7**	**51**	**0.29**	**0.26**	<0.41	<0.55	**7.1**	**1.1**	**4.1**	**1.6**	<0.13	<0.35	<0.40	<0.40
	BMS-SS-1-031213	3/12/2013	**0.2**	**40**	<0.25	**0.58**	<0.41	<0.55	**22**	**1.2**	**3.3**	**1.3**	<0.13	<0.35	<0.40	<0.40
	BMS-SS-1-061413	6/14/2013	<0.10	**63**	**0.54**	<0.32	<0.82	<1.1	**4.2**	<0.88	**1.6**	<0.88	<0.26	<0.71	<0.80	<0.80
	BMS-SS-1-091913	9/19/2013	<0.10	**82**	**0.35**	**0.16**	<0.41	<0.55	**3.8**	**1.1**	**2.8**	**1.9**	<0.13	<0.35	<0.40	<0.40
	BMS-SS-1-121013	12/10/2013	**0.70**	**12**	<0.25	**0.77**	<0.41	<0.55	**2.6**	**0.85**	**1.8**	**0.73**	<0.13	<0.35	<0.40	<0.40
	BMS-SS-1-041114	4/11/2014	<0.10	**80**	<0.25	**0.26**	<0.41	<0.55	**2.1**	<0.44	**0.88**	<0.44	<0.13	<0.35	<0.40	<0.40
	BMS-SS-1-060614	6/6/2014	<0.10	**110**	**0.53**	**0.79**	<0.41	<0.55	**5.2**	<0.44	**1.4**	**0.73**	<0.13	<0.35	<0.40	<0.40
	BMS-SS-1-091214	9/12/2014	<0.10	**57**	**0.99**	**0.19**	<0.41	<0.55	**1.4**	<0.44	**0.66**	<0.44	<0.13	<0.35	<0.40	<0.40
	BMS-SS-1-120414	12/4/2014	<0.10	**27**	<0.25	<0.16	<0.41	<0.55	**0.76**	<0.44	**0.69**	<0.44	<0.13	<0.35	<0.40	<0.40
	BMS-SS-1-031615	3/16/2015	<0.10	**47**	<0.49	<0.32	<0.82	<1.1	**8.2**	<0.88	**0.96**	<0.88	<0.26	**0.74**	<0.80	<0.80
	BMS-SS-1-062415	6/24/2015	<0.10	**166**	<0.49	<0.32	<0.82	<1.09	<1.53	<0.88	<0.88	<0.88	<0.26	<0.71	<0.80	<0.80
	BMS-SS-1-092515	9/25/2015	<0.10	**37**	<0.25	<0.16	<0.41	<0.55	**1.1**	**0.47**	**2.1**	**1.2**	<0.13	<0.35	<0.40	**0.54**
	BMS-SS-1-010716	1/7/2016	<0.10	**8.2**	<0.25	<0.16	<0.41	<0.55	**<0.76**	**<0.44**	**<0.44**	**<0.44**	<0.13	<0.35	<0.40	**<0.40**
	BMS-SS-1-041417	4/14/2017	<0.10	**23**	**0.49**	**0.45**	<0.41	<0.55	**4.0**	**0.53**	**1.3**	**0.66**	<0.13	<0.35	<0.40	<0.40
Main Floor Sink Area	BMS-SS-2-092511	9/25/2011	<1.0	**45,000**	**27**	<3.2	<4.1	<5.5	**19**	<4.4	<8.8	<4.4	<2.6	<3.5	<8.0	<4.0
Reception Area	BMS-SS-3-092511	9/25/2011	<1.0	**50,000**	**16**	<3.2	<4.1	<5.5	**15**	<4.4	<8.8	<4.4	<2.6	<3.5	<8.0	<4.0
SE Corner Nap/ Play Area	BMS-SS-4-081312	8/13/2012	**1.8**	**110**	**1.4**	**0.60**	<0.82	<1.1	**5.7**	**1.3**	**5.8**	**1.8**	<0.26	**6,200**	<0.80	<0.80
	BMS-SS-4-091212	9/12/2012	**4.8**	**14**	**2.4**	**0.94**	<0.82	<1.1	**25**	**4.4**	**11**	**4.5**	<0.26	**1,300**	<0.80	<0.80
	BMS-SS-4-110512	11/5/2012	**6.7**	**4.0**	**2.6**	**1.5**	**0.42**	<0.55	**12**	**1.8**	**5.3**	**2.3**	<0.13	**780**	<0.40	<0.40
	BMS-SS-4-031213	3/12/2013	**6.1**	**1.1**	**1.2**	**1.4**	<0.41	<0.55	**4.5**	**0.76**	**2.1**	**0.71**	<0.13	**130**	<0.40	<0.40
	BMS-SS-4-061413	6/14/2013	**4.89**	**6.8**	**3.8**	**0.27**	<0.41	<0.55	**3.0**	**0.70**	**1.5**	**0.69**	<0.13	**420 E**	<0.40	<0.40
	BMS-SS-4-091913	9/19/2013	**1.46**	**3.9**	**5.4**	**0.55**	<0.41	<0.55	**12**	**3.0**	**7.0**	**4.5**	<0.13	**110**	<0.40	<0.40
	BMS-SS-4-121013	12/10/2013	**6.68**	<0.69	**0.34**	**2.8**	<0.41	<0.55	**6.7**	**1.8**	**4.1**	**1.5**	<0.13	**13**	<0.40	<0.40
	BMS-SS-4-041114	4/11/2014	**0.70**	**2.9**	**0.42**	**0.60**	<0.41	<0.55	**3.0**	**0.44**	**1.4**	**0.55**	<0.13	**29**	<0.40	<0.40
	BMS-SS-4-060614	6/6/2014	**1.68**	**7.8**	**1.5**	**0.41**	<0.41	<0.55	**4.2**	<0.44	**1.3**	**0.57**	<0.13	**44**	<0.40	<0.40
	BMS-SS-4-091214	9/12/2014	<0.10	**1.5**	**5.5**	**0.49**	<0.41	<0.55	**3.0**	<0.44	**1.2**	**0.57**	<0.13	**0.35**	<0.40	<0.40
	BMS-SS-4-120414	12/4/2014	<0.10	**84**	**1.1**	**0.49**	<0.41	<0.55	**2.3**	<0.44	**1.6**	**0.55**	<0.13	**5.3**	<0.40	<0.40
	BMS-SS-4-031615	3/16/2015	**1.19**	**4.4**	**1.7**	**0.67**	<0.41	<0.55	**17**	**0.87**	**3.0**	**1.4**	<0.13	**8.4**	<0.40	<0.40
SW Corner Nap/ Play Area	BMS-SS-5-062415	6/24/2015	**0.76**	**9.64**	**0.30**	**0.36**	<0.41	<0.55	**2.10**	**0.88**	**2.33**	**1.01**	<0.13	<0.35	<0.40	**4.14**
	BMS-SS-5-092515	9/25/2015	<0.10	**1.8**	**3.10**	**0.99**	**1.0**	<0.55	**4.1**	**1.5**	**5.0**	**1.9**	<0.13	**0.43**	<0.40	**0.95**
	BMS-SS-5-010716	1/7/2016	0.25	**2.6**	**1.0**	**2.2**	**0.57**	<0.55	**7.2**	**1.6**	**4.8**	**1.4**	<0.13	**0.63**	<0.40	**<0.40**
	BMS-SS-5-041417	4/14/2017	**1.42**	<0.69	**1.4**	**1.2**	<0.41	<0.55	**5.8**	**1.0**	**3.4**	**1.4**	<0.13	**0.95**	<0.40	<0.40

Notes:
(a) Screening levels calculated by multiplying MTCA Method B indoor air cleanup levels by 30 times attenuation.
(b) Helium was used as a leak check compound during soil gas sampling. Results are presented in units of percent.

All units are in micrograms per cubic meter ($\mu g/m^3$), unless otherwise noted.
Detected concentrations are shown in **boldface.**
NA = not applicable

Figures





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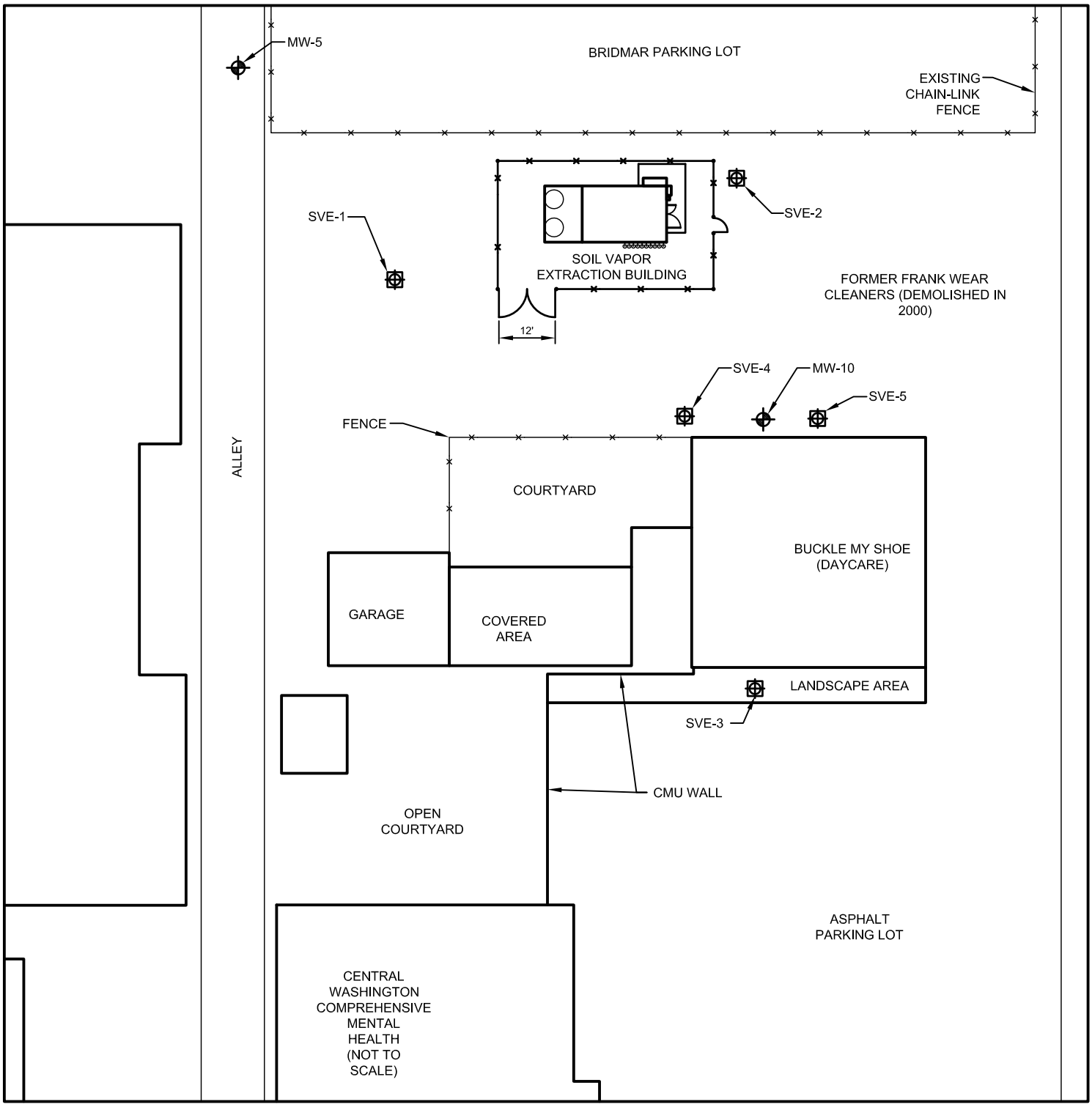
WASHINGTON STATE DEPARTMENT OF ECOLOGY
FORMER FRANK WEAR SITE
YAKIMA, WASHINGTON

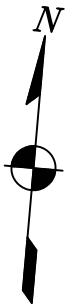
SITE MAP

119016.00\FIG-01

10/11

FIGURE 1





LEGEND

SVE-4 SOIL VAPOR EXTRACTION WELL

MW-10 MONITORING WELL

0 15 30

APPROXIMATE 1" = 30'-0"

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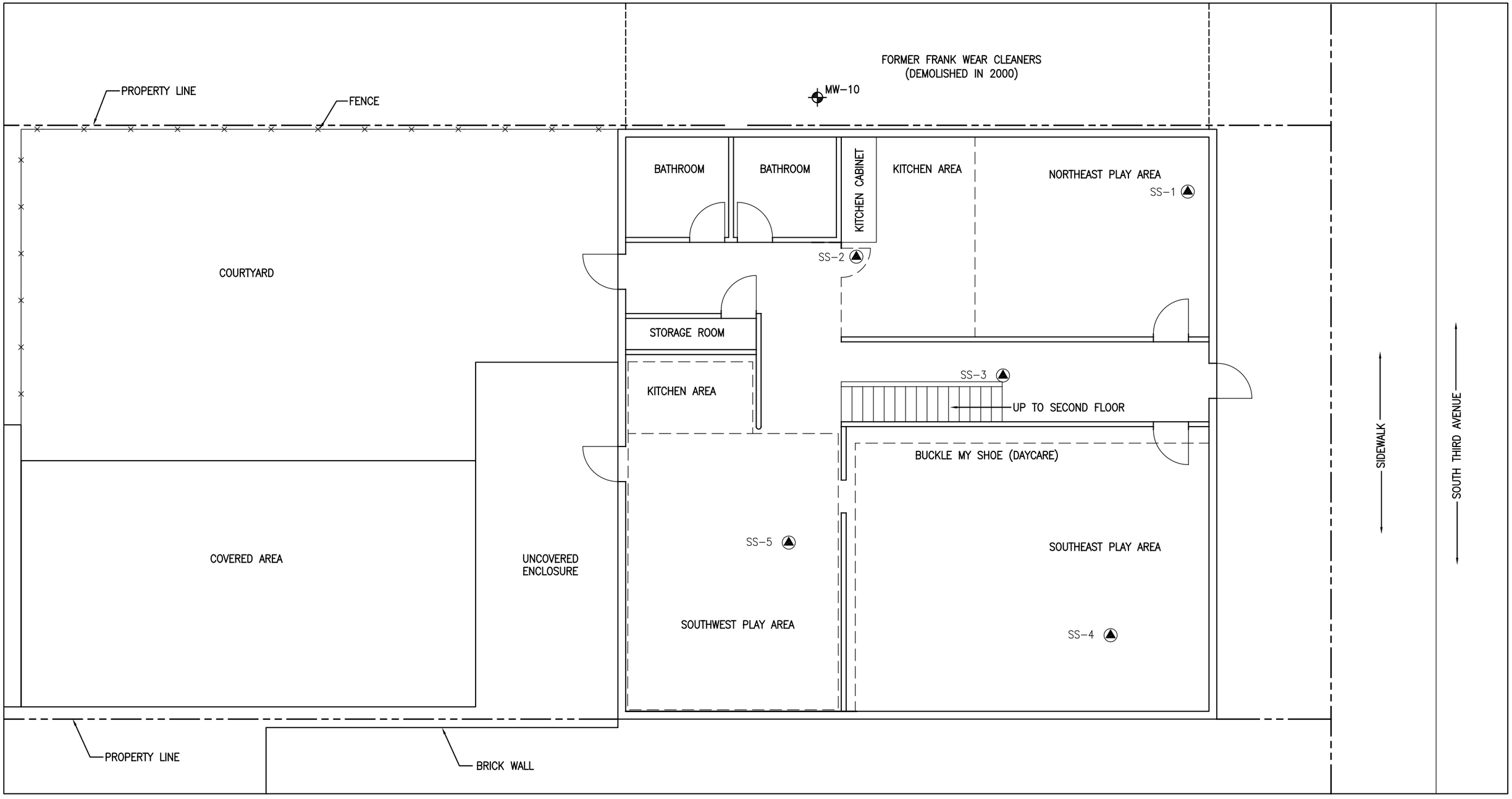
FRANK WEAR SITE
YAKIMA, WASHINGTON

SVE WELL LOCATIONS

1196016.00\ANNUAL\FIG-02

FIGURE 2



LEGEND

SS-1 SUBSLAB MONITORING POINT

MW-10 MONITORING WELL

NOTE: ALL LOCATIONS ARE APPROXIMATE

N

0 5 10

1/8"=1'-0"

APPROXIMATE SCALE 1/8"=1'

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FRANK WEAR SITE
YAKIMA, WASHINGTON

SUBSLAB MONITORING LOCATIONS

1196016.00\ANNUAL\FIG-03

FIGURE 3

Figure 4: PCE Concentrations Before and After GAC Treatment

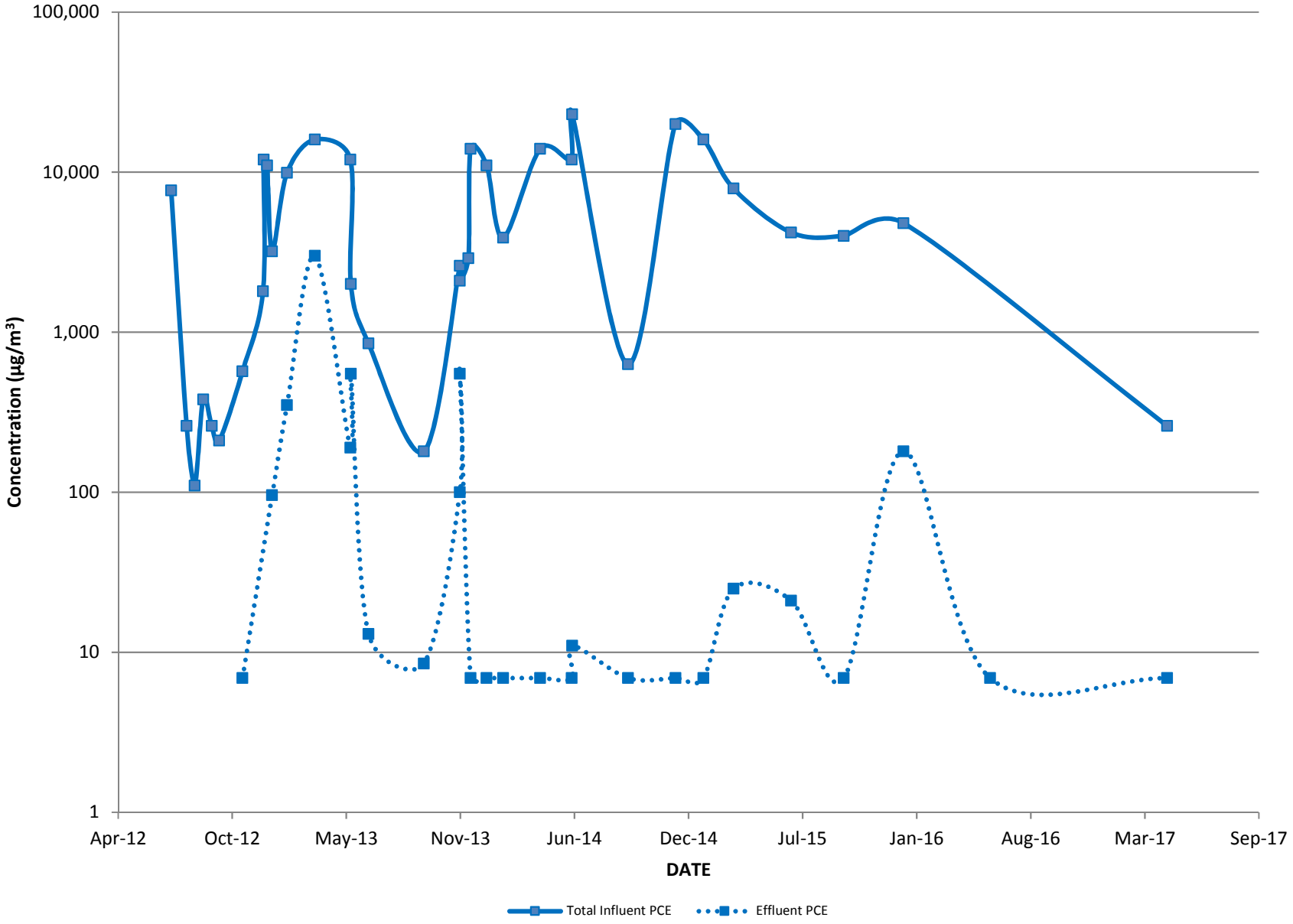
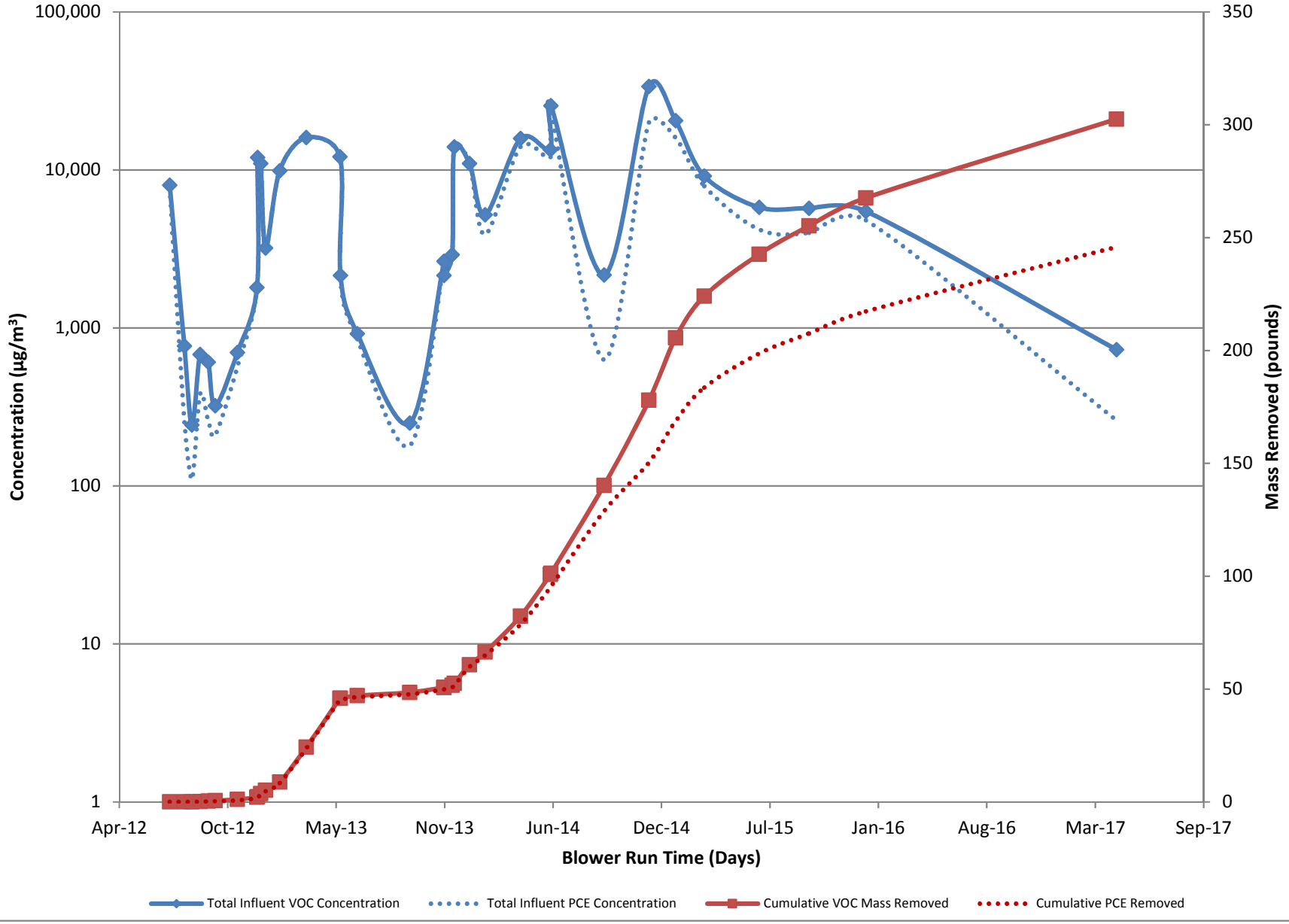


Figure 5: Influent Soil Vapor Concentrations and Mass Removed



Appendix A

SVE System Performance Monitoring Logs

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 04/14/17 0800

NOTES: Note any observations, adjustments, or system issues here.

AMBIENT TEMPERATURE (F):	65	
BLOWER INLET VACUUM (in. WC):	25	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	1.75 in H2O	
BLOWER INLET TEMPERATURE (F):	62	
BLOWER DISCHARGE TEMPERATURE (F):	116	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	—	Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	23	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	NA	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	0	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):	—	
LAG GAC VACUUM (in. WC):	—	
TOTAL INFLUENT PID (ppm):	—	
GAC BETWEEN PID (ppm):	—	
GAC EFFLUENT PID (ppm):	—	

TAG #

Suma Canister Sample: 090

Suma Canister Sample: 249

Suma Canister Sample: 150

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): MIXED

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	—	-22	—	-21	—	-23	-22	-20	—	-21
FLOW (CFM)	—	21	—	28	—	4	109	~90	—	86
PID (ppm)	—	—	—	—	—	—	—	—	—	—
TEMPERATURE (F)	—	61	—	67	—	62	67	65	—	67
WELL HEAD VACUUM (in WC)	—	—	—	—	—	—	—	—	—	—
DTW (FT from TOC)	—	—	—	—	—	—	—	—	—	—

↳ moisture on Velocical probe

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.036	-0.078	-0.024	—	-0.016
CONDITION:	good	good	good	—	good ↳ SS- loose cap

NOTES: Target sub-slab vacuum = 0.005 in. H20

Ambient Pressure: _____

TOC = top of casing

bgs = below ground surface

0825 Stericycle arrives onsite to remove supersacks w/ piping + PPE for disposal.
0845 offsite; stericycle departs; LDL arrives to remove Haz Waste Super Sacks.
1045 LDL departs site.

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 3/6/17 0750 Am

NOTES: Note any observations, adjustments, or system issues here.

AMBIENT TEMPERATURE (F):	70	
BLOWER INLET VACUUM (in. WC):	-24	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	0.75 mH2O	
BLOWER INLET TEMPERATURE (F):	62	
BLOWER DISCHARGE TEMPERATURE (F):	118	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	—	Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-25	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	NA	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	0	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):	—	
LAG GAC VACUUM (in. WC):	—	
TOTAL INFLUENT PID (ppm):	—	
GAC BETWEEN PID (ppm):	—	
GAC EFFLUENT PID (ppm):	—	

TAG #

Suma Canister Sample: (NA)

Suma Canister Sample:

Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): Mixed

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	—	-20	—	-20	—	-20	-19	-21	—	-20
FLOW (CFM)	—	20	—	18	—	1-2	102	50	—	38
PID (ppm)	—	—	—	—	—	—	—	—	—	—
TEMPERATURE (F)	—	67	—	72	—	68	69	69	—	71
WELL HEAD VACUUM (in WC)	—	—	—	—	—	—	—	—	—	—
DTW (FT from TOC)	—	—	—	—	—	—	—	—	—	—

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.032	-0.076	-0.022	—	-0.016
CONDITION:	ok	ok	ok	—	ok

SS-5 → cap loose

NOTES: Target sub-slab vacuum = 0.005 in. H20

Ambient Pressure: _____

TOC = top of casing

bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 2/14/17 1255

NOTES: Note any observations, adjustments, or system issues here.

AMBIENT TEMPERATURE (F):	37°	
BLOWER INLET VACUUM (in. WC):	-25	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	1.75	
BLOWER INLET TEMPERATURE (F):	62	
BLOWER DISCHARGE TEMPERATURE (F):	120	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	—	Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-23	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	NA	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	0	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):	—	
LAG GAC VACUUM (in. WC):	—	TAG #
TOTAL INFLUENT PID (ppm):	—	Suma Canister Sample:
GAC BETWEEN PID (ppm):	—	Suma Canister Sample:
GAC EFFLUENT PID (ppm):	—	Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	0	-20	0	-20	0	-22	2/14 KS 0 -22	-20	-0	-20
FLOW (CFM)	—	—	—	—	—	—	—	—	—	—
PID (ppm)	—	—	—	—	—	—	—	—	—	—
TEMPERATURE (F)	—	—	—	—	—	—	—	—	—	—
WELL HEAD VACUUM (in WC)	—	—	—	—	—	—	—	—	—	—
DTW (FT from TOC)	—	—	—	—	—	—	—	—	—	—

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.013	-0.077	-0.021	—	-0.027
CONDITION:	OK	OK	OK	—	OK

NOTES: Target sub-slab vacuum = 0.005 in. H20

Ambient Pressure: _____

TOC = top of casing

bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 01/08/16

NOTES: Note any observations, adjustments, or system issues here.

Switch from upper to lower zone extraction
Post system adjustment measurements
01/7/16

	LOW	Up
SVE5	On-0804	off-0806
SVE-4	On-0807	off-0808
SVE-3	on-0809	off-0810
SVE-2	on-0819	off-0820
SVE-1	on-0822	off-0823

AMBIENT TEMPERATURE (F):	36°	70°F in building
BLOWER INLET VACUUM (in. WC):	-43	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	Δ1.25	
BLOWER INLET TEMPERATURE (F):	65	
BLOWER DISCHARGE TEMPERATURE (F):	136	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	—	Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-41	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	2nd	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	30	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):	—	
LAG GAC VACUUM (in. WC):	—	
TOTAL INFLUENT PID (ppm):	—	
GAC BETWEEN PID (ppm):	—	
GAC EFFLUENT PID (ppm):	—	

TAG #

Suma Canister Sample:

Suma Canister Sample:

Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): Lower

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	0	-40	0 -(3)	-41	0 -(2)	-41	0	-40	0	-40
FLOW (CFM)	—	23-32	—	3-8	—	10	—	---NM	—	---NM
PID (ppm)	—	—	—	—	—	—	—	—	—	—
TEMPERATURE (F)	—	65.0	—	62.5	—	61.7	—	60.4	—	60.5
WELL HEAD VACUUM (in WC)										
DTW (FT from TOC)										

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.019	-0.041	-0.013	X	-0.010
CONDITION:	OK	OK	OK		OK

NOTES: Target sub-slab vacuum = 0.005 in. H20

Ambient Pressure: _____

TOC = top of casing

bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM PERFORMANCE MONITORING RECORD SHEET

DATE/TIME: 01/07/16 0700 ADJUSTMENT SHEET (Yes/No)? N TROUBLESHOOT SHEET (Yes/No)? N

NOTES: Note any observations, adjustments, or system issues here.

Pre system adjustment measurements

AMBIENT TEMPERATUR (F):	36°	(68°F in building)
BLOWER INLET VACUUM (in. WC):	-18	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	Δ1.9	- Magnahelic
BLOWER INLET TEMPERATURE (F):	64	Keep under 150 F
BLOWER DISCHARGE TEMPERATURE (F):	116	Keep under 130 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	—	
VLS VACUUM (in. WC):	-16	
N/A → VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	~~[illegible]~~	If above 2nd/3rd float, see troubleshoot sheet
160 GALLON TANK WATER LEVEL (Gal):	30gal	Remove as necessary and per O&M Plan
LEAD GAC VACUUM (in. WC):	—	- unknown } broken gauges
LAG GAC VACUUM (in. WC):	—	- unknown
GAC INFLUENT PID (ppm):	—	
GAC BETWEEN PID (ppm):	—	
GAC EFFLUENT PID (ppm):	—	

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from WT)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	-13	0	-13.5	0	-15	0	-14	0	-14	0
FLOW (CFM)	~90	—	~43	—	~5	—	~83	—	~98	
PID (ppm)	—	—	—	—	—	—	—	—	—	—
TEMPERATURE (F)	69.0	—	67.2	—	69.1	—	67.1	—	67.5	—
WELL HEAD VACUUM (in WC)	—	—	—	—	—	—	—	—	—	—
DTW (FT from WT)	—	—	—	—	—	—	—	—	—	—

SUB SLAB DEPRESSURIZATION MONTIORING POINTS

NOTES: Always maintain negative vacuum under slab

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.036	-0.073	-0.017	X	-0.010
CONDITION:	ok	ok	ok		ok

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 12/21/16 10:00

NOTES: Note any observations, adjustments, or system issues here.

@ 1015 switch system to Lower zone on all wells

AMBIENT TEMPERATURE (F):	22	
BLOWER INLET VACUUM (in. WC):	-18	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	2	
BLOWER INLET TEMPERATURE (F):	60	
BLOWER DISCHARGE TEMPERATURE (F):	114	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	—	Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-16	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	NA	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	0	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):	—	
LAG GAC VACUUM (in. WC):	—	
TOTAL INFLUENT PID (ppm):	—	Suma Canister Sample: TAG #
GAC BETWEEN PID (ppm):	—	Suma Canister Sample:
GAC EFFLUENT PID (ppm):	—	Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	-13	0	-14	0	-15	0	-14	0	-14	0
FLOW (CFM)										
PID (ppm)										
TEMPERATURE (F)										
WELL HEAD VACUUM (in WC)										
DTW (FT from TOC)										

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.036	-0.067	-0.019	—	-0.008
CONDITION:	OK	OK	OK	—	OK

NOTES: Target sub-slab vacuum = 0.005 in. H20

Ambient Pressure: _____

TOC = top of casing

bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 11/30/2016 9:50

NOTES: Note any observations, adjustments, or system issues here.

AMBIENT TEMPERATURE (F):	41	
BLOWER INLET VACUUM (in. WC):	-17	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	2	
BLOWER INLET TEMPERATURE (F):	70	
BLOWER DISCHARGE TEMPERATURE (F):	120	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:		Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-15	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	NA	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	None	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):		
LAG GAC VACUUM (in. WC):		
TOTAL INFLUENT PID (ppm):		TAG #
GAC BETWEEN PID (ppm):		Suma Canister Sample:
GAC EFFLUENT PID (ppm):		Suma Canister Sample:
		Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	-14	0	-14	0	-15	0	-14	0	-14	0
FLOW (CFM)										
PID (ppm)										
TEMPERATURE (F)										
WELL HEAD VACUUM (in WC)										
DTW (FT from TOC)										

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.033	-0.074	-0.020		-0.008
CONDITION:	OK	OK	OK		OK

NOTES: Target sub-slab vacuum = 0.005 in. H20

Ambient Pressure: _____

TOC = top of casing

bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 10/26/2016 10:00

NOTES: Note any observations, adjustments, or system issues here.

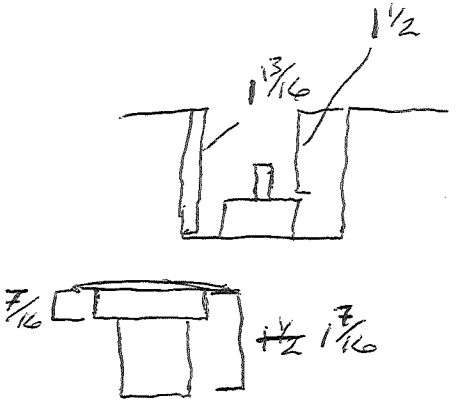
AMBIENT TEMPERATURE (F):	50	
BLOWER INLET VACUUM (in. WC):	-18	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	~~70~~ 2	
BLOWER INLET TEMPERATURE (F):	70	
BLOWER DISCHARGE TEMPERATURE (F):	125	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	—	Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-12	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	None	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	None	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):	—	
LAG GAC VACUUM (in. WC):	—	
TOTAL INFLUENT PID (ppm):	—	
GAC BETWEEN PID (ppm):	—	
GAC EFFLUENT PID (ppm):	—	

TAG #

Suma Canister Sample:

Suma Canister Sample:

Suma Canister Sample:



SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	-12	0	-13	0	-15	0	~~-14~~ -16	0	-14	0
FLOW (CFM)										
PID (ppm)										
TEMPERATURE (F)										
WELL HEAD VACUUM (in WC)										
DTW (FT from TOC)										

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	*	-0.083	-0.024	—	-0.013
CONDITION:		OK	OK		OK

NOTES: Target sub-slab vacuum = 0.005 in. H20

Ambient Pressure: _____

TOC = top of casing

bgs = below ground surface

*didn't sample port because kids were playing on mat above it, and all other locations checked out.

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

K. Parker

DATE/TIME: 9/22/16 0920

NOTES: Note any observations, adjustments, or system issues here.

AMBIENT TEMPERATURE (F):	62	-15
BLOWER INLET VACUUM (in. WC):	~~15~~ 96	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	~~45~~ 2	
BLOWER INLET TEMPERATURE (F):	76	
BLOWER DISCHARGE TEMPERATURE (F):	128	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:		Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-14	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	NA	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	0	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):		
LAG GAC VACUUM (in. WC):		TAG #
TOTAL INFLUENT PID (ppm):		Suma Canister Sample:
GAC BETWEEN PID (ppm):		Suma Canister Sample:
GAC EFFLUENT PID (ppm):		Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	-10	0	-10	0	-12	0	-10	0	-10	0
FLOW (CFM)										
PID (ppm)										
TEMPERATURE (F)										
WELL HEAD VACUUM (in WC)										
DTW (FT from TOC)										

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.036	-0.078	-0.027		-0.021
CONDITION:	OK	OK	OK		OK

NOTES: Target sub-slab vacuum = 0.005 in. H20

Ambient Pressure: _____

TOC = top of casing

bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 8/17/2016 9:45

NOTES: Note any observations, adjustments, or system issues here.

AMBIENT TEMPERATURE (F):	79 °F	
BLOWER INLET VACUUM (in. WC):	-15	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	2	
BLOWER INLET TEMPERATURE (F):	82	
BLOWER DISCHARGE TEMPERATURE (F):	136	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:		Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-12	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	None	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	0	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):		
LAG GAC VACUUM (in. WC):		TAG #
TOTAL INFLUENT PID (ppm):		Suma Canister Sample:
GAC BETWEEN PID (ppm):		Suma Canister Sample:
GAC EFFLUENT PID (ppm):		Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	-10	0	-10	0	-12	0	-10	0	-10	-1
FLOW (CFM)										
PID (ppm)										
TEMPERATURE (F)										
WELL HEAD VACUUM (in WC)										
DTW (FT from TOC)										

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.054	-0.093	-0.059	NA	-0.029
CONDITION:	OK	OK	OK	NA	OK

NOTES: Target sub-slab vacuum = 0.005 in. H20

Ambient Pressure: _____

TOC = top of casing

bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: July 20, 2016 10:00

NOTES: Note any observations, adjustments, or system issues here.

AMBIENT TEMPERATURE (F):	70	
BLOWER INLET VACUUM (in. WC):	-15	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	~~80~~ 78	
BLOWER INLET TEMPERATURE (F):	2	
BLOWER DISCHARGE TEMPERATURE (F):	130	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	—	Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-12	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	NA	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	0	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):	—	
LAG GAC VACUUM (in. WC):	—	TAG #
TOTAL INFLUENT PID (ppm):	—	Suma Canister Sample:
GAC BETWEEN PID (ppm):	—	Suma Canister Sample:
GAC EFFLUENT PID (ppm):	—	Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	-10	—	-10	0	-11	0	-10	0	-10	-1
FLOW (CFM)										
PID (ppm)										
TEMPERATURE (F)										
WELL HEAD VACUUM (in WC)										
DTW (FT from TOC)										

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.047	-0.088	-0.034	—	-0.029
CONDITION:	OK	OK	OK	—	OK

NOTES: Target sub-slab vacuum = 0.005 in. H20

Ambient Pressure: _____

TOC = top of casing

bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 10/8/16 945

NOTES: Note any observations, adjustments, or system issues here.

AMBIENT TEMPERATURE (F):	75	
BLOWER INLET VACUUM (in. WC):	-15	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	2	
BLOWER INLET TEMPERATURE (F):	78	
BLOWER DISCHARGE TEMPERATURE (F):	130	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	—	Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-12	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	NA	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	0	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):	~	
LAG GAC VACUUM (in. WC):	—	TAG #
TOTAL INFLUENT PID (ppm):	—	Suma Canister Sample:
GAC BETWEEN PID (ppm):	—	Suma Canister Sample:
GAC EFFLUENT PID (ppm):	—	Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	-10	0	-10	0	-11	0	-10	0	-10	0
FLOW (CFM)	—	—	—	—	—	—	—	—	—	—
PID (ppm)	—	—	—	—	—	—	—	—	—	—
TEMPERATURE (F)	—	—	—	—	—	—	—	—	—	—
WELL HEAD VACUUM (in WC)	—	—	—	—	—	—	—	—	—	—
DTW (FT from TOC)	—	—	—	—	—	—	—	—	—	—

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.029	-0.087	-0.032	NA	-0.048
CONDITION:	OK	OK	OK	NA	OK

NOTES: Target sub-slab vacuum = 0.005 in. H20

Ambient Pressure: _____

TOC = top of casing

bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 5/11/16 10:10

NOTES: Note any observations, adjustments, or system issues here.

Switched SVE-2, SVE-3, + SVE-5 from lower zone extraction to upper zone extraction at 10:25am.

AMBIENT TEMPERATURE (F):	62	
BLOWER INLET VACUUM (in. WC):	-20	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	1.78	
BLOWER INLET TEMPERATURE (F):	65	
BLOWER DISCHARGE TEMPERATURE (F):	125	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	—	Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-19	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	NA	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	0	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):	—	
LAG GAC VACUUM (in. WC):	—	TAG #
TOTAL INFLUENT PID (ppm):	—	Suma Canister Sample:
GAC BETWEEN PID (ppm):	—	Suma Canister Sample:
GAC EFFLUENT PID (ppm):	—	Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	-16	—	0	-16.5	0	-17	-17	—	0	-17
FLOW (CFM)										
PID (ppm)										
TEMPERATURE (F)										
WELL HEAD VACUUM (in WC)										
DTW (FT from TOC)										

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.029	-0.066	-0.021	NA	-0.019
CONDITION:	OK	OK	OK	NA	OK

NOTES: Target sub-slab vacuum = 0.005 in. H20

Ambient Pressure: _____

TOC = top of casing

bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 1/22/16 9:10

NOTES: Note any observations, adjustments, or system issues here.

AMBIENT TEMPERATURE (F):	36	
BLOWER INLET VACUUM (in. WC):	-22	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	1.77	
BLOWER INLET TEMPERATURE (F):	60	
BLOWER DISCHARGE TEMPERATURE (F):	115	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	—	Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-20	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	~~25~~ Between 1-2	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	5	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):	—	
LAG GAC VACUUM (in. WC):	—	TAG #
TOTAL INFLUENT PID (ppm):	—	Suma Canister Sample:
GAC BETWEEN PID (ppm):	—	Suma Canister Sample:
GAC EFFLUENT PID (ppm):	—	Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/(MIXED)): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	-17	0	0	-18	0	-19	-19	0	0	-19
FLOW (CFM)	—	—	—	—	—	—	—	—	—	—
PID (ppm)	—	—	—	—	—	—	—	—	—	—
TEMPERATURE (F)	—	—	—	—	—	—	—	—	—	—
WELL HEAD VACUUM (in WC)	—	—	—	—	—	—	—	—	—	—
DTW (FT from TOC)	—	—	—	—	—	—	—	—	—	—

SUB SLAB DEPRESSURIZATION MONITORING POINTS

NOTES: Target sub-slab vacuum = 0.005 in. H20
Ambient Pressure: _____

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	~~-0.015~~ -0.019	-0.060	-0.016	NA	~~-0.014~~ -0.015
CONDITION:	OK	OK	OK	NA	OK

TOC = top of casing
bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 1/21/16 1530

NOTES: Note any observations, adjustments, or system issues here.
Condensate from air seperater collecting too quickly (100+ gal every 2.5 days)
Switched wells 1 and 4 from lower zone to upper zone, As these to wells had moistare in them when collecting air sample.

AMBIENT TEMPERATURE (F):	—	
BLOWER INLET VACUUM (in. WC):	-22	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):	1.75	
BLOWER INLET TEMPERATURE (F):	62	
BLOWER DISCHARGE TEMPERATURE (F):	125	Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	~~-20~~ N/A	Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):	-20	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	Between 1st & 2nd Float	If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):	5	Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):	—	
LAG GAC VACUUM (in. WC):	—	
TOTAL INFLUENT PID (ppm):	—	TAG #
GAC BETWEEN PID (ppm):	—	Suma Canister Sample:
GAC EFFLUENT PID (ppm):	—	Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	before/After 0 / -17	before -20 / After 0	0	-18	1	-19	after -18 / before 0	after 0 / before -19	0	-18
FLOW (CFM)	—	—	—	—	—	—	—	—	—	—
PID (ppm)	—	—	—	—	—	—	—	—	—	—
TEMPERATURE (F)	—	—	—	—	—	—	—	—	—	—
WELL HEAD VACUUM (in WC)	—	—	—	—	—	—	—	—	—	—
DTW (FT from TOC)	—	—	—	—	—	—	—	—	—	—

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):					
CONDITION:					

NOTES: Target sub-slab vacuum = 0.005 in. H20
Ambient Pressure: _____

TOC = top of casing
bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM ADJUSTMENT RECORD SHEET

DATE/TIME: 2016/01/11 / 1030

NOTES: Note any observations, adjustments, or system issues here.

01/11/16 1030 Drained 120 gallons of water from overfill tank
01/14/16 Drained 100 gallons of water from overfill tank (white poly tank).
1/19/16 Drained 145 gallons of water from overfill tank (white poly tank).

AMBIENT TEMPERATURE (F):		
BLOWER INLET VACUUM (in. WC):		Keep under 50 in. WC
BLOWER INLET FLOW (CFM):		
BLOWER INLET TEMPERATURE (F):		
BLOWER DISCHARGE TEMPERATURE (F):		Keep under 160 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:		Keep under 140 F, located at steel/PVC transition
VLS VACUUM (in. WC):		
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):		If above LSHH or LSH - alarm, see O&M Plan for troubleshooting
160 GALLON TANK WATER LEVEL (Gal):		Waste characterization/disposal per O&M Plan
LEAD GAC VACUUM (in. WC):		
LAG GAC VACUUM (in. WC):		TAG #
TOTAL INFLUENT PID (ppm):		Suma Canister Sample:
GAC BETWEEN PID (ppm):		Suma Canister Sample:
GAC EFFLUENT PID (ppm):		Suma Canister Sample:

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from TOC)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)										
FLOW (CFM)										
PID (ppm)										
TEMPERATURE (F)										
WELL HEAD VACUUM (in WC)										
DTW (FT from TOC)										

SUB SLAB DEPRESSURIZATION MONITORING POINTS

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):					
CONDITION:					

NOTES: Target sub-slab vacuum = 0.005 in. H20
Ambient Pressure: _____

TOC = top of casing
bgs = below ground surface

FRANK WEAR SVE SYSTEM - SYSTEM PERFORMANCE MONITORING RECORD SHEET

DATE/TIME: 9/25/15 ADJUSTMENT SHEET (Yes/No)? No TROUBLESHOOT SHEET (Yes/No)? No

NOTES: Note any observations, adjustments, or system issues here.

AMBIENT TEMPERATUR (F):	88 building	
BLOWER INLET VACUUM (in. WC):	-24	Keep under 50 in. WC
BLOWER INLET FLOW (CFM):		
BLOWER INLET TEMPERATURE (F):	76	Keep under 150 F
BLOWER DISCHARGE TEMPERATURE (F):	122.5	Keep under 130 F
BLOWER DISCHARGE TEMPERATURE (F) @ PVC:	—	
VLS VACUUM (in. WC):	-12	
VLS MOISTURE LEVEL (NA,1st, 2nd, 3rd Float):	NA	If above 2nd/3rd float, see troubleshoot sheet
160 GALLON TANK WATER LEVEL (Gal):	~10	Remove as necessary and per O&M Plan
LEAD GAC VACUUM (in. WC):	broken gauge, -15 w/ flow meter	
LAG GAC VACUUM (in. WC):	18	
GAC INFLUENT PID (ppm):	Not Measured	
GAC BETWEEN PID (ppm):	NM	
GAC EFFLUENT PID (ppm):	NM	

SVE WELLS - OPERATION MODE (UPPER/LOWER/MIXED): _____

	SVE-1		SVE-2		SVE-3		SVE-4		SVE-5	
ZONE	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
SCREEN INTERVAL (FT from WT)	12.92 - 7.92	19.92 - 14.92	12.96 - 7.96	19.96 - 14.96	12.95 - 7.95	19.45 - 14.95	13.0 - 8.0	20.0 - 15.0	12.95 - 7.95	19.95 - 14.95
MANIFOLD VACUUM (in WC)	-10		-10.5		-11.5		-11.5		-11	
FLOW (CFM)	520		310		162		620		57.8	
PID (ppm)	NM		NM		NM		NM		NM	
TEMPERATURE (F)	84.8		86.8		87.9		83.4		83.5	
WELL HEAD VACUUM (in WC)	—		—		—		—		—	
DTW (FT from WT)	—		—		—		—		—	

SUB SLAB DEPRESSURIZATION MONTIORING POINTS

NOTES: Always maintain negative vacuum under slab

	SS-1	SS-2	SS-3	SS-4	SS-5
VACUUM (in. WC):	-0.039	-0.080	-0.028	X	-0.025
CONDITION:	OK	OK	OK	abandoned	OK

a little crooked installation on the stainless steel cover @ this location.

Appendix B

SVE Laboratory Analytical Reports
and Chain-of-Custody Documentation

Mobile Geochemistry Inc.

26 January 2016

Mr. Josh Hopp
Kennedy/Jenks Consultants - Washington
32001 32nd Ave. South, Suite 100
Federal Way, WA 98001

H&P Project: KJ011216-13
Client Project: 1196016.00 Task 8 / Yakima, WA

Dear Mr. Josh Hopp:

Enclosed is the analytical report for the above referenced project. The data herein applies to samples as received by H&P Mobile Geochemistry, Inc. on 12-Jan-16 which were analyzed in accordance with the attached Chain of Custody record(s).

The results for all sample analyses and required QA/QC analyses are presented in the following sections and summarized in the documents:

- Sample Summary
- Case Narrative (if applicable)
- Sample Results
- Quality Control Summary
- Notes and Definitions / Appendix
- Chain of Custody
- Sampling Logs (if applicable)

Unless otherwise noted, I certify that all analyses were performed and reviewed in compliance with our Quality Systems Manual and Standard Operating Procedures. This report shall not be reproduced, except in full, without the written approval of H&P Mobile Geochemistry, Inc.

We at H&P Mobile Geochemistry, Inc. sincerely appreciate the opportunity to provide analytical services to you on this project. If you have any questions or concerns regarding this analytical report, please contact me at your convenience at 760-804-9678.

Sincerely,

Janis Villarreal

Janis Villarreal
Laboratory Director

H&P Mobile Geochemistry, Inc. is certified under the California ELAP, the National Environmental Laboratory Accreditation Conference (NELAC) and the Department of Defense Accreditation Programs.

H&P Mobile
Geochemistry Inc.

2470 Impala Drive
Carlsbad, CA 92010
760-804-9678 Phone
760-804-9159 Fax

Kennedy/Jenks Consultants - Washington	Project: KJ011216-13	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 8 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	26-Jan-16 11:49

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SVE-1 low-107	E601042-01	Vapor	08-Jan-16	12-Jan-16
SVE-2 low-384	E601042-02	Vapor	08-Jan-16	12-Jan-16
SVE-3 low-047	E601042-03	Vapor	08-Jan-16	12-Jan-16
SVE-4 low-132	E601042-04	Vapor	08-Jan-16	12-Jan-16
SVE-5 low-318	E601042-05	Vapor	08-Jan-16	12-Jan-16
SVE-influent-123	E601042-06	Vapor	08-Jan-16	12-Jan-16
SVE-effluent-368	E601042-07	Vapor	08-Jan-16	12-Jan-16
SVE-inbetween-292	E601042-08	Vapor	08-Jan-16	12-Jan-16

Due to the presence of water in the summa canisters, the following samples were analyzed by H&P 8260SV rather than EPA Method TO-15:
SVE-1 low-107
SVE-4 low-132
SVE-effluent-368

H&P Mobile
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32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 8 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	26-Jan-16 11:49

DETECTIONS SUMMARY

Sample ID: **SVE-1 low-107** Laboratory ID: **E601042-01**

Analyte	Result	Reporting Limit	Units	Method	Notes
Tetrachloroethene	**420**	190	ug/m3	H&P 8260SV	

Sample ID: **SVE-2 low-384** Laboratory ID: **E601042-02**

Analyte	Result	Reporting Limit	Units	Method	Notes
Vinyl chloride	**31**	13	ug/m3	EPA TO-15	
cis-1,2-Dichloroethene	**1700**	20	ug/m3	EPA TO-15	
Chloroform	**27**	25	ug/m3	EPA TO-15	
Trichloroethene	**1400**	27	ug/m3	EPA TO-15	
Tetrachloroethene	**17000**	69	ug/m3	EPA TO-15	

Sample ID: **SVE-3 low-047** Laboratory ID: **E601042-03**

Analyte	Result	Reporting Limit	Units	Method	Notes
cis-1,2-Dichloroethene	**250**	4.0	ug/m3	EPA TO-15	
Chloroform	**6.6**	4.9	ug/m3	EPA TO-15	
Benzene	**90**	3.2	ug/m3	EPA TO-15	
Trichloroethene	**160**	5.5	ug/m3	EPA TO-15	
Toluene	**35**	3.8	ug/m3	EPA TO-15	
Tetrachloroethene	**910**	6.9	ug/m3	EPA TO-15	

Sample ID: **SVE-4 low-132** Laboratory ID: **E601042-04**

Analyte	Result	Reporting Limit	Units	Method	Notes
Tetrachloroethene	**890**	200	ug/m3	H&P 8260SV	

Sample ID: **SVE-5 low-318** Laboratory ID: **E601042-05**

Analyte	Result	Reporting Limit	Units	Method	Notes
cis-1,2-Dichloroethene	**490**	20	ug/m3	EPA TO-15	
Trichloroethene	**430**	27	ug/m3	EPA TO-15	
Tetrachloroethene	**6100**	34	ug/m3	EPA TO-15	

Sample ID: **SVE-influent-123** Laboratory ID: **E601042-06**

Analyte	Result	Reporting Limit	Units	Method	Notes
Vinyl chloride	**5.0**	2.6	ug/m3	EPA TO-15	

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Kennedy/Jenks Consultants - Washington	Project: KJ011216-13	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 8 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	26-Jan-16 11:49

Sample ID: **SVE-influent-123** Laboratory ID: **E601042-06**

Analyte	Result	Reporting Limit	Units	Method	Notes
cis-1,2-Dichloroethene	**340**	4.0	ug/m3	EPA TO-15	
Chloroform	**10**	4.9	ug/m3	EPA TO-15	
Trichloroethene	**310**	5.5	ug/m3	EPA TO-15	
Tetrachloroethene	**4800**	14	ug/m3	EPA TO-15	

Sample ID: **SVE-effluent-368** Laboratory ID: **E601042-07**

Analyte	Result	Reporting Limit	Units	Method	Notes
Benzene	**410**	180	ug/m3	H&P 8260SV	
Trichloroethene	**360**	180	ug/m3	H&P 8260SV	

Sample ID: **SVE-inbetween-292** Laboratory ID: **E601042-08**

Analyte	Result	Reporting Limit	Units	Method	Notes
Vinyl chloride	**4.5**	2.6	ug/m3	EPA TO-15	
cis-1,2-Dichloroethene	**60**	4.0	ug/m3	EPA TO-15	
Benzene	**13**	3.2	ug/m3	EPA TO-15	
Trichloroethene	**42**	5.5	ug/m3	EPA TO-15	
Toluene	**10**	3.8	ug/m3	EPA TO-15	
Tetrachloroethene	**690**	6.9	ug/m3	EPA TO-15	
m,p-Xylene	**8.8**	8.8	ug/m3	EPA TO-15	

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Kennedy/Jenks Consultants - Washington	Project: KJ011216-13	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 8 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	26-Jan-16 11:49

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SVE-2 low-384 (E601042-02) Vapor Sampled: 08-Jan-16 Received: 12-Jan-16									
Vinyl chloride	**31**	13	ug/m3	5	EA61507	18-Jan-16	18-Jan-16	EPA TO-15	
Methylene chloride (Dichloromethane)	ND	18	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	**1700**	20	"	"	"	"	"	"	
Chloroform	**27**	25	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	21	"	"	"	"	"	"	
Benzene	ND	16	"	"	"	"	"	"	
Trichloroethene	**1400**	27	"	"	"	"	"	"	
Toluene	ND	19	"	"	"	"	"	"	
Tetrachloroethene	**17000**	69	"	10	"	"	"	"	
Ethylbenzene	ND	22	"	5	"	"	"	"	
m,p-Xylene	ND	44	"	"	"	"	"	"	
o-Xylene	ND	22	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*125 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*105 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*82.3 %*		*77-127*	"	"	"	"	
SVE-3 low-047 (E601042-03) Vapor Sampled: 08-Jan-16 Received: 12-Jan-16									
Vinyl chloride	ND	2.6	ug/m3	1	EA61507	18-Jan-16	18-Jan-16	EPA TO-15	
Methylene chloride (Dichloromethane)	ND	3.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	8.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	**250**	4.0	"	"	"	"	"	"	
Chloroform	**6.6**	4.9	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	4.1	"	"	"	"	"	"	
Benzene	**90**	3.2	"	"	"	"	"	"	
Trichloroethene	**160**	5.5	"	"	"	"	"	"	
Toluene	**35**	3.8	"	"	"	"	"	"	
Tetrachloroethene	**910**	6.9	"	"	"	"	"	"	
Ethylbenzene	ND	4.4	"	"	"	"	"	"	
m,p-Xylene	ND	8.8	"	"	"	"	"	"	
o-Xylene	ND	4.4	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*124 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*105 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*83.1 %*		*77-127*	"	"	"	"	

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Kennedy/Jenks Consultants - Washington	Project: KJ011216-13	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 8 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	26-Jan-16 11:49

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SVE-5 low-318 (E601042-05) Vapor Sampled: 08-Jan-16 Received: 12-Jan-16									
Vinyl chloride	ND	13	ug/m3	5	EA61507	18-Jan-16	18-Jan-16	EPA TO-15	
Methylene chloride (Dichloromethane)	ND	18	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	**490**	20	"	"	"	"	"	"	
Chloroform	ND	25	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	21	"	"	"	"	"	"	
Benzene	ND	16	"	"	"	"	"	"	
Trichloroethene	**430**	27	"	"	"	"	"	"	
Toluene	ND	19	"	"	"	"	"	"	
Tetrachloroethene	**6100**	34	"	"	"	"	"	"	
Ethylbenzene	ND	22	"	"	"	"	"	"	
m,p-Xylene	ND	44	"	"	"	"	"	"	
o-Xylene	ND	22	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*128 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*105 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*81.4 %*		*77-127*	"	"	"	"	
SVE-influent-123 (E601042-06) Vapor Sampled: 08-Jan-16 Received: 12-Jan-16									
Vinyl chloride	**5.0**	2.6	ug/m3	1	EA61507	18-Jan-16	19-Jan-16	EPA TO-15	
Methylene chloride (Dichloromethane)	ND	3.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	8.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	**340**	4.0	"	"	"	"	"	"	
Chloroform	**10**	4.9	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	4.1	"	"	"	"	"	"	
Benzene	ND	3.2	"	"	"	"	"	"	
Trichloroethene	**310**	5.5	"	"	"	"	"	"	
Toluene	ND	3.8	"	"	"	"	"	"	
Tetrachloroethene	**4800**	14	"	2	"	"	"	"	
Ethylbenzene	ND	4.4	"	1	"	"	"	"	
m,p-Xylene	ND	8.8	"	"	"	"	"	"	
o-Xylene	ND	4.4	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*83.9 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*82.7 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*87.2 %*		*77-127*	"	"	"	"	

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Geochemistry Inc.

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Kennedy/Jenks Consultants - Washington	Project: KJ011216-13	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 8 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	26-Jan-16 11:49

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SVE-inbetween-292 (E601042-08) Vapor	**Sampled: 08-Jan-16**	**Received: 12-Jan-16**							
Vinyl chloride	**4.5**	2.6	ug/m3	1	EA61507	18-Jan-16	19-Jan-16	EPA TO-15	
Methylene chloride (Dichloromethane)	ND	3.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	8.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	**60**	4.0	"	"	"	"	"	"	
Chloroform	ND	4.9	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	4.1	"	"	"	"	"	"	
Benzene	**13**	3.2	"	"	"	"	"	"	
Trichloroethene	**42**	5.5	"	"	"	"	"	"	
Toluene	**10**	3.8	"	"	"	"	"	"	
Tetrachloroethene	**690**	6.9	"	"	"	"	"	"	
Ethylbenzene	ND	4.4	"	"	"	"	"	"	
m,p-Xylene	**8.8**	8.8	"	"	"	"	"	"	
o-Xylene	ND	4.4	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*122 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*106 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*86.3 %*		*77-127*	"	"	"	"	

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32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 8 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	26-Jan-16 11:49

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SVE-1 low-107 (E601042-01) Vapor Sampled: 08-Jan-16 Received: 12-Jan-16									
Vinyl chloride	ND	100	ug/m3	0.096	EA61407	25-Jan-16	25-Jan-16	H&P 8260SV	
Methylene chloride (Dichloromethane)	ND	960	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	960	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	960	"	"	"	"	"	"	
Chloroform	ND	190	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	190	"	"	"	"	"	"	
Benzene	ND	190	"	"	"	"	"	"	
Trichloroethene	ND	190	"	"	"	"	"	"	
Toluene	ND	1900	"	"	"	"	"	"	
Tetrachloroethene	**420**	190	"	"	"	"	"	"	
Ethylbenzene	ND	960	"	"	"	"	"	"	
m,p-Xylene	ND	960	"	"	"	"	"	"	
o-Xylene	ND	960	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*99.7 %*		*75-125*		"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*97.9 %*		*75-125*		"	"	"	
Surrogate: Toluene-d8		*100 %*		*75-125*		"	"	"	
Surrogate: 4-Bromofluorobenzene		*110 %*		*75-125*		"	"	"	
SVE-4 low-132 (E601042-04) Vapor Sampled: 08-Jan-16 Received: 12-Jan-16									
Vinyl chloride	ND	100	ug/m3	0.098	EA61407	25-Jan-16	25-Jan-16	H&P 8260SV	
Methylene chloride (Dichloromethane)	ND	980	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	980	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	980	"	"	"	"	"	"	
Chloroform	ND	200	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	200	"	"	"	"	"	"	
Benzene	ND	200	"	"	"	"	"	"	
Trichloroethene	ND	200	"	"	"	"	"	"	
Toluene	ND	2000	"	"	"	"	"	"	
Tetrachloroethene	**890**	200	"	"	"	"	"	"	
Ethylbenzene	ND	980	"	"	"	"	"	"	
m,p-Xylene	ND	980	"	"	"	"	"	"	
o-Xylene	ND	980	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*96.8 %*		*75-125*		"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*99.3 %*		*75-125*		"	"	"	
Surrogate: Toluene-d8		*102 %*		*75-125*		"	"	"	
Surrogate: 4-Bromofluorobenzene		*108 %*		*75-125*		"	"	"	

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32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 8 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	26-Jan-16 11:49

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SVE-effluent-368 (E601042-07) Vapor Sampled: 08-Jan-16 Received: 12-Jan-16									
Vinyl chloride	ND	90	ug/m3	0.088	EA61407	25-Jan-16	25-Jan-16	H&P 8260SV	
Methylene chloride (Dichloromethane)	ND	880	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	880	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	880	"	"	"	"	"	"	
Chloroform	ND	180	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	180	"	"	"	"	"	"	
Benzene	**410**	180	"	"	"	"	"	"	
Trichloroethene	**360**	180	"	"	"	"	"	"	
Toluene	ND	1800	"	"	"	"	"	"	
Tetrachloroethene	ND	180	"	"	"	"	"	"	
Ethylbenzene	ND	880	"	"	"	"	"	"	
m,p-Xylene	ND	880	"	"	"	"	"	"	
o-Xylene	ND	880	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*97.8 %*		*75-125*	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*97.2 %*		*75-125*	"	"	"	"	
Surrogate: Toluene-d8		*102 %*		*75-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*107 %*		*75-125*	"	"	"	"	

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32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 8 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	26-Jan-16 11:49

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA61507 - TO-15										
Blank (EA61507-BLK1)				Prepared & Analyzed: 18-Jan-16						
Vinyl chloride	ND	2.6	ug/m3							
Methylene chloride (Dichloromethane)	ND	3.5	"							
trans-1,2-Dichloroethene	ND	8.0	"							
cis-1,2-Dichloroethene	ND	4.0	"							
Chloroform	ND	4.9	"							
1,2-Dichloroethane (EDC)	ND	4.1	"							
Benzene	ND	3.2	"							
Trichloroethene	ND	5.5	"							
Toluene	ND	3.8	"							
Tetrachloroethene	ND	6.9	"							
Ethylbenzene	ND	4.4	"							
m,p-Xylene	ND	8.8	"							
o-Xylene	ND	4.4	"							
Surrogate: 1,2-Dichloroethane-d4	*273*		*"*	*214*		*127*	*76-134*			
Surrogate: Toluene-d8	*212*		*"*	*207*		*103*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*309*		*"*	*364*		*84.8*	*77-127*			
LCS (EA61507-BS1)				Prepared & Analyzed: 18-Jan-16						
Vinyl chloride	56	2.6	ug/m3	52.0		107	70-130			
Methylene chloride (Dichloromethane)	61	3.5	"	70.8		86.3	70-130			
trans-1,2-Dichloroethene	67	8.0	"	80.8		82.5	70-130			
cis-1,2-Dichloroethene	66	4.0	"	80.0		82.9	70-130			
Chloroform	90	4.9	"	99.2		90.4	70-130			
1,2-Dichloroethane (EDC)	79	4.1	"	82.4		95.6	70-130			
Benzene	52	3.2	"	64.8		79.9	70-130			
Trichloroethene	88	5.5	"	110		80.7	70-130			
Toluene	61	3.8	"	76.8		79.8	70-130			
Tetrachloroethene	110	6.9	"	138		77.4	70-130			
Ethylbenzene	63	4.4	"	88.4		71.3	70-130			
m,p-Xylene	130	8.8	"	177		74.4	70-130			
o-Xylene	67	4.4	"	88.4		75.7	70-130			
Surrogate: 1,2-Dichloroethane-d4	*259*		*"*	*214*		*121*	*76-134*			

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32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 8 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	26-Jan-16 11:49

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA61507 - TO-15										
LCS (EA61507-BS1)				Prepared & Analyzed: 18-Jan-16						
Surrogate: Toluene-d8	*209*		*ug/m3*	*207*		*101*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*326*		*"*	*364*		*89.4*	*77-127*			
LCS Dup (EA61507-BSD1)				Prepared & Analyzed: 18-Jan-16						
Vinyl chloride	57	2.6	ug/m3	52.0		110	70-130	2.70	25	
Methylene chloride (Dichloromethane)	60	3.5	"	70.8		84.8	70-130	1.80	25	
trans-1,2-Dichloroethene	67	8.0	"	80.8		83.5	70-130	1.20	25	
cis-1,2-Dichloroethene	67	4.0	"	80.0		83.9	70-130	1.15	25	
Chloroform	87	4.9	"	99.2		87.7	70-130	3.02	25	
1,2-Dichloroethane (EDC)	78	4.1	"	82.4		94.1	70-130	1.58	25	
Benzene	52	3.2	"	64.8		80.9	70-130	1.24	25	
Trichloroethene	87	5.5	"	110		79.1	70-130	1.99	25	
Toluene	60	3.8	"	76.8		78.5	70-130	1.69	25	
Tetrachloroethene	110	6.9	"	138		76.5	70-130	1.17	25	
Ethylbenzene	63	4.4	"	88.4		71.8	70-130	0.695	25	
m,p-Xylene	130	8.8	"	177		73.3	70-130	1.48	25	
o-Xylene	65	4.4	"	88.4		73.9	70-130	2.46	25	
Surrogate: 1,2-Dichloroethane-d4	*265*		*"*	*214*		*123*	*76-134*			
Surrogate: Toluene-d8	*207*		*"*	*207*		*99.8*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*323*		*"*	*364*		*88.7*	*77-127*			

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Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	26-Jan-16 11:49

Volatile Organic Compounds by H&P 8260SV - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA61407 - EPA 5030										
Blank (EA61407-BLK1)				Prepared & Analyzed: 25-Jan-16						
Vinyl chloride	ND	50	ug/m3							
Methylene chloride (Dichloromethane)	ND	500	"							
trans-1,2-Dichloroethene	ND	500	"							
cis-1,2-Dichloroethene	ND	500	"							
Chloroform	ND	100	"							
1,2-Dichloroethane (EDC)	ND	100	"							
Benzene	ND	100	"							
Trichloroethene	ND	100	"							
Toluene	ND	1000	"							
Tetrachloroethene	ND	100	"							
Ethylbenzene	ND	500	"							
m,p-Xylene	ND	500	"							
o-Xylene	ND	500	"							
Surrogate: Dibromofluoromethane	*2510*		*"*	*2500*		*100*	*75-125*			
Surrogate: 1,2-Dichloroethane-d4	*2430*		*"*	*2500*		*97.1*	*75-125*			
Surrogate: Toluene-d8	*2550*		*"*	*2500*		*102*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*2690*		*"*	*2500*		*108*	*75-125*			
LCS (EA61407-BS1)				Prepared & Analyzed: 25-Jan-16						
Vinyl chloride	4300	50	ug/m3	5000		85.3	70-130			
Methylene chloride (Dichloromethane)	5200	500	"	5000		103	70-130			
trans-1,2-Dichloroethene	5200	500	"	5000		104	70-130			
cis-1,2-Dichloroethene	5500	500	"	5000		111	70-130			
Chloroform	5100	100	"	5000		103	70-130			
1,2-Dichloroethane (EDC)	5100	100	"	5000		102	70-130			
Benzene	5400	100	"	5000		108	70-130			
Trichloroethene	5200	100	"	5000		103	70-130			
Toluene	5200	1000	"	5000		105	70-130			
Tetrachloroethene	5400	100	"	5000		108	70-130			
Ethylbenzene	5600	500	"	5000		112	70-130			
m,p-Xylene	12000	500	"	10000		120	70-130			
o-Xylene	5500	500	"	5000		111	70-130			

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Volatile Organic Compounds by H&P 8260SV - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA61407 - EPA 5030										
LCS (EA61407-BS1)				Prepared & Analyzed: 25-Jan-16						
Surrogate: Dibromofluoromethane	*2480*		*ug/m3*	*2500*		*99.4*	*75-125*			
Surrogate: 1,2-Dichloroethane-d4	*2360*		*"*	*2500*		*94.3*	*75-125*			
Surrogate: Toluene-d8	*2580*		*"*	*2500*		*103*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*2570*		*"*	*2500*		*103*	*75-125*			

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Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	26-Jan-16 11:49

Notes and Definitions

LCC	Leak Check Compound
ND	Analyte NOT DETECTED at or above the reporting limit
MDL	Method Detection Limit
%REC	Percent Recovery
RPD	Relative Percent Difference

Appendix

H&P Mobile Geochemistry, Inc. is approved as an Environmental Testing Laboratory and Mobile Laboratory in accordance with the DoD-ELAP and the ISO 17025 programs, certification number L11-175.

H&P is approved by the State of Arizona as an Environmental Testing Laboratory and Mobile Laboratory, certification numbers AZM758 and AZ0779.

H&P is approved by the State of California as an Environmental Laboratory and Mobile Laboratory in conformance with the Environmental Laboratory Accreditation Program (ELAP) for the category of Volatile and Semi-Volatile Organic Chemistry of Hazardous Waste, certification numbers 2740, 2741, 2743, 2744, 2745, 2754 & 2930.

H&P is approved by the State of Florida Department of Health under the National Environmental Laboratory Accreditation Conference (NELAC) certification number E871100.

The complete list of stationary and mobile laboratory certifications along with the fields of testing (FOTs) and analyte lists are available at www.handpmg.com/about/certifications.

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VAPOR / AIR Chain of Custody

DATE: 1-8-16
Page 1 of 1

Lab Client and Project Information

Lab Client/Consultant: Kennedy Jenks Consultants	Project Name / #: Frank Wear 119601G.00 Task 8
Lab Client Project Manager: Josh Hoppe	Project Location: Yakima, WA
Lab Client Address: 32001 32nd Ave S, Suite 100	Report E-Mail(s): joshhoppe kennedyjenks.com
Lab Client City, State, Zip: Federal Way, WA 98001	
Phone Number: 253-835-6408	

Reporting Requirements

- [x] Standard Report [ ] Level III [ ] Level IV
- [x] Excel EDD [ ] Other EDD:
- [ ] CA Geotracker Global ID:

Turnaround Time

- [x] 5-7 day Stnd [ ] 24-Hr Rush
- [ ] 3-day Rush [ ] Mobile Lab
- [ ] 48-Hr Rush [ ] Other:

Sampler Information

Sampler(s): Josh Hoppe
Signature:
Date: 1-8-16

Sample Receipt (Lab Use Only)

Date Rec'd: 1/12/16	Control #: 160063.01
H&P Project # KJ011216-13	
Lab Work Order # EG01042	
Sample Intact: [x] Yes [ ] No [ ] See Notes Below	
Receipt Gauge ID: 11167	Temp: 22°C
Outside Lab:	
Receipt Notes/Tracking #: 1Z93T T618 7486 5008 8	Lab PM Initials: SUZ

Additional Instructions to Laboratory:

- [ ] Check if Project Analyte List is Attached
- ** Preferred VOC units (please choose one):*
- [ ] µg/L [ ] µg/m³ [ ] ppbv [ ] ppmv

(*) SVE-1 low-107, SVE-4 low-132 and SVE-effluent-368 were analyzed by H&P 8260SV 1/26/16

SAMPLE NAME	FIELD POINT NAME (if applicable)	DATE mm/dd/yy	TIME 24hr clock	SAMPLE TYPE Indoor Air (IA), Ambient Air (AA), Subslab (SS), Soil Vapor (SV)	CONTAINER SIZE & TYPE 400mL/1L/6L Summa or Tedlar or Tube	CONTAINER ID (###)	Lab use only: Receipt Vac	VOCs Standard Full List ☐ 8260SV ☐ TO-15	VOCs Short List / Project List ☐ 8260SV ☒ TO-15	Oxygenates ☐ 8260SV ☐ TO-15	Naphthalene ☐ 8260SV ☐ TO-15 ☐ TO-17m	TPHv as Gas ☐ 8260SVm ☐ TO-15m	TPHv as Diesel (sorbent tube) ☐ TO-17m	Aromatic/Aliphatic Fractions ☐ 8260SVm ☐ TO-15m	Leak Check Compound ☐ DFA ☐ IPA ☐ He	Methane by EPA 8015m	Fixed Gases by ASTM D1945 ☐ CO2 ☐ O2 ☐ N2			
SVE-1 low-107	moisture (*)	01/08/16	12:29	SV	400ml summa	107	-3.28		X											
SVE-2 low-384		01/08/16	12:35			384	-3.35		X											
SVE-3 low-047		01/08/16	12:38			047	-3.46		X											
SVE-4 low-132	moisture (*)	01/08/16	12:42			132	-3.10		X											
SVE-5 low-318		01/08/16	12:46			318	-3.27		X											
MID SVE-effluent-377		01/08/16	12:49																	
SVE-influent-123		01/08/16	12:52			123	-3.45		X											
SVE-effluent-368	(*)	01/08/16	13:01			368	0.54		X											
SVE-inbetween-292		01/09/16	13:05			292	0.74		X											

Relinquished by	Company	Date	Time	Received by	Company	Date	Time
Josh Hoppe	KJ	1/8/16	1530		H+P	1/12/16	15:20

*Approval constitutes as authorization to proceed with analysis and acceptance of conditions on back

Rev 08/18/2014

H&P Mobile Geochemistry Inc.

03 May 2017

Mr. Josh Hopp
Kennedy/Jenks Consultants - Washington
32001 32nd Ave. South, Suite 100
Federal Way, WA 98001

H&P Project: KJ041917-12
Client Project: 1796004.00 / Yakima, WA

Dear Mr. Josh Hopp:

Enclosed is the analytical report for the above referenced project. The data herein applies to samples as received by H&P Mobile Geochemistry, Inc. on 19-Apr-17 which were analyzed in accordance with the attached Chain of Custody record(s).

The results for all sample analyses and required QA/QC analyses are presented in the following sections and summarized in the documents:

- Sample Summary
- Case Narrative (if applicable)
- Sample Results
- Quality Control Summary
- Notes and Definitions / Appendix
- Chain of Custody
- Sampling Logs (if applicable)

Unless otherwise noted, I certify that all analyses were performed and reviewed in compliance with our Quality Systems Manual and Standard Operating Procedures. This report shall not be reproduced, except in full, without the written approval of H&P Mobile Geochemistry, Inc.

We at H&P Mobile Geochemistry, Inc. sincerely appreciate the opportunity to provide analytical services to you on this project. If you have any questions or concerns regarding this analytical report, please contact me at your convenience at 760-804-9678.

Sincerely,

Janis La Roux
Laboratory Director

H&P Mobile Geochemistry, Inc. is certified under the California ELAP and the National Environmental Laboratory Accreditation Conference (NELAC). H&P is approved as an Environmental Testing Laboratory and Mobile Laboratory in accordance with the DoD-ELAP Program and ISO/IEC 17025:2005 programs, accreditation number 69070 for EPA Method TO-15, H&P Method TO-15, EPA Method 8260B and H&P 8260SV.

H&P Mobile
Geochemistry Inc.

2470 Impala Drive
Carlsbad, CA 92010
760-804-9678 Phone
760-804-9159 Fax

Kennedy/Jenks Consultants - Washington	Project: KJ041917-12	
32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FW-Influent-090	E704092-01	Vapor	14-Apr-17	19-Apr-17
FW-Btwn-249	E704092-02	Vapor	14-Apr-17	19-Apr-17
FW-Effluent-150	E704092-03	Vapor	14-Apr-17	19-Apr-17

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32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:55

DETECTIONS SUMMARY

Sample ID: **FW-Influent-090** Laboratory ID: **E704092-01**

Analyte	Result	Reporting Limit	Units	Method	Notes
Methylene chloride (Dichloromethane)	**29**	3.5	ug/m3	EPA TO-15	
Chloroform	**7.4**	4.9	ug/m3	EPA TO-15	
1,2-Dichloroethane (EDC)	**14**	4.1	ug/m3	EPA TO-15	
Benzene	**9.3**	3.2	ug/m3	EPA TO-15	
Trichloroethene	**7.6**	5.5	ug/m3	EPA TO-15	
Toluene	**350**	3.8	ug/m3	EPA TO-15	
Tetrachloroethene	**260**	6.9	ug/m3	EPA TO-15	
Ethylbenzene	**8.5**	4.4	ug/m3	EPA TO-15	
m,p-Xylene	**32**	8.8	ug/m3	EPA TO-15	
o-Xylene	**11**	4.4	ug/m3	EPA TO-15	

Sample ID: **FW-Btwn-249** Laboratory ID: **E704092-02**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

Sample ID: **FW-Effluent-150** Laboratory ID: **E704092-03**

Analyte	Result	Reporting Limit	Units	Method	Notes
Benzene	**4.3**	3.2	ug/m3	EPA TO-15	
Toluene	**4.2**	3.8	ug/m3	EPA TO-15	

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Kennedy/Jenks Consultants - Washington	Project: KJ041917-12	
32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:55

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
FW-Influent-090 (E704092-01) Vapor Sampled: 14-Apr-17 Received: 19-Apr-17									
Vinyl chloride	ND	2.6	ug/m3	1	ED72006	20-Apr-17	21-Apr-17	EPA TO-15	
Methylene chloride (Dichloromethane)	**29**	3.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	8.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	4.0	"	"	"	"	"	"	
Chloroform	**7.4**	4.9	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	**14**	4.1	"	"	"	"	"	"	
Benzene	**9.3**	3.2	"	"	"	"	"	"	
Trichloroethene	**7.6**	5.5	"	"	"	"	"	"	
Toluene	**350**	3.8	"	"	"	"	"	"	
Tetrachloroethene	**260**	6.9	"	"	"	"	"	"	
Ethylbenzene	**8.5**	4.4	"	"	"	"	"	"	
m,p-Xylene	**32**	8.8	"	"	"	"	"	"	
o-Xylene	**11**	4.4	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*114 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*105 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*91.9 %*		*77-127*	"	"	"	"	
FW-Btwn-249 (E704092-02) Vapor Sampled: 14-Apr-17 Received: 19-Apr-17									
Vinyl chloride	ND	2.6	ug/m3	1	ED72006	20-Apr-17	21-Apr-17	EPA TO-15	
Methylene chloride (Dichloromethane)	ND	3.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	8.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	4.0	"	"	"	"	"	"	
Chloroform	ND	4.9	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	4.1	"	"	"	"	"	"	
Benzene	ND	3.2	"	"	"	"	"	"	
Trichloroethene	ND	5.5	"	"	"	"	"	"	
Toluene	ND	3.8	"	"	"	"	"	"	
Tetrachloroethene	ND	6.9	"	"	"	"	"	"	
Ethylbenzene	ND	4.4	"	"	"	"	"	"	
m,p-Xylene	ND	8.8	"	"	"	"	"	"	
o-Xylene	ND	4.4	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*111 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*105 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*90.6 %*		*77-127*	"	"	"	"	

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32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:55

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
FW-Effluent-150 (E704092-03) Vapor	**Sampled: 14-Apr-17**	**Received: 19-Apr-17**							
Vinyl chloride	ND	2.6	ug/m3	1	ED72006	20-Apr-17	21-Apr-17	EPA TO-15	
Methylene chloride (Dichloromethane)	ND	3.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	8.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	4.0	"	"	"	"	"	"	
Chloroform	ND	4.9	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	4.1	"	"	"	"	"	"	
Benzene	**4.3**	3.2	"	"	"	"	"	"	
Trichloroethene	ND	5.5	"	"	"	"	"	"	
Toluene	**4.2**	3.8	"	"	"	"	"	"	
Tetrachloroethene	ND	6.9	"	"	"	"	"	"	
Ethylbenzene	ND	4.4	"	"	"	"	"	"	
m,p-Xylene	ND	8.8	"	"	"	"	"	"	
o-Xylene	ND	4.4	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*117 %*	*76-134*		"	"	"	"	
Surrogate: Toluene-d8		*105 %*	*78-125*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*93.9 %*	*77-127*		"	"	"	"	

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Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch ED72006 - TO-15										
Blank (ED72006-BLK1)				Prepared & Analyzed: 20-Apr-17						
Vinyl chloride	ND	2.6	ug/m3							
Methylene chloride (Dichloromethane)	ND	3.5	"							
trans-1,2-Dichloroethene	ND	8.0	"							
cis-1,2-Dichloroethene	ND	4.0	"							
Chloroform	ND	4.9	"							
1,2-Dichloroethane (EDC)	ND	4.1	"							
Benzene	ND	3.2	"							
Trichloroethene	ND	5.5	"							
Toluene	ND	3.8	"							
Tetrachloroethene	ND	6.9	"							
Ethylbenzene	ND	4.4	"							
m,p-Xylene	ND	8.8	"							
o-Xylene	ND	4.4	"							
Surrogate: 1,2-Dichloroethane-d4	*239*		*"*	*214*		*112*	*76-134*			
Surrogate: Toluene-d8	*220*		*"*	*207*		*106*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*334*		*"*	*364*		*91.8*	*77-127*			
LCS (ED72006-BS1)				Prepared & Analyzed: 20-Apr-17						
Vinyl chloride	50	2.6	ug/m3	52.0		96.3	64-127			
Methylene chloride (Dichloromethane)	69	3.5	"	70.8		97.6	62-115			
trans-1,2-Dichloroethene	62	8.0	"	80.8		76.9	67-124			
cis-1,2-Dichloroethene	64	4.0	"	80.0		80.5	70-121			
Chloroform	100	4.9	"	99.2		106	68-123			
1,2-Dichloroethane (EDC)	85	4.1	"	82.4		103	65-128			
Benzene	54	3.2	"	64.8		82.8	69-119			
Trichloroethene	110	5.5	"	110		101	71-123			
Toluene	67	3.8	"	76.8		86.7	66-119			
Tetrachloroethene	130	6.9	"	138		92.0	66-124			
Ethylbenzene	71	4.4	"	88.4		80.1	70-124			
m,p-Xylene	72	8.8	"	88.4		81.6	61-134			
o-Xylene	72	4.4	"	88.4		81.7	67-125			
Surrogate: 1,2-Dichloroethane-d4	*240*		*"*	*214*		*112*	*76-134*			

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32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:55

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch ED72006 - TO-15										
LCS (ED72006-BS1)				Prepared & Analyzed: 20-Apr-17						
Surrogate: Toluene-d8	*207*		*ug/m3*	*207*		*100*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*344*		*"*	*364*		*94.3*	*77-127*			
LCS Dup (ED72006-BSD1)				Prepared & Analyzed: 20-Apr-17						
Vinyl chloride	50	2.6	ug/m3	52.0		96.5	64-127	0.259	25	
Methylene chloride (Dichloromethane)	70	3.5	"	70.8		99.4	62-115	1.82	25	
trans-1,2-Dichloroethene	62	8.0	"	80.8		77.1	67-124	0.259	25	
cis-1,2-Dichloroethene	66	4.0	"	80.0		82.8	70-121	2.83	25	
Chloroform	110	4.9	"	99.2		109	68-123	3.33	25	
1,2-Dichloroethane (EDC)	85	4.1	"	82.4		103	65-128	0.435	25	
Benzene	54	3.2	"	64.8		83.1	69-119	0.301	25	
Trichloroethene	110	5.5	"	110		101	71-123	0.246	25	
Toluene	67	3.8	"	76.8		87.8	66-119	1.37	25	
Tetrachloroethene	130	6.9	"	138		92.9	66-124	1.03	25	
Ethylbenzene	72	4.4	"	88.4		81.9	70-124	2.21	25	
m,p-Xylene	72	8.8	"	88.4		81.1	61-134	0.612	25	
o-Xylene	72	4.4	"	88.4		81.1	67-125	0.733	25	
Surrogate: 1,2-Dichloroethane-d4	*245*		*"*	*214*		*114*	*76-134*			
Surrogate: Toluene-d8	*206*		*"*	*207*		*99.6*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*347*		*"*	*364*		*95.3*	*77-127*			

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Kennedy/Jenks Consultants - Washington	Project: KJ041917-12	
32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:55

Notes and Definitions

LCC	Leak Check Compound
ND	Analyte NOT DETECTED at or above the reporting limit
MDL	Method Detection Limit
%REC	Percent Recovery
RPD	Relative Percent Difference

Appendix

H&P Mobile Geochemistry, Inc. is approved as an Environmental Testing Laboratory and Mobile Laboratory in accordance with the DoD-ELAP Program and ISO/IEC 17025:2005 programs, accreditation number 69070 for EPA Method TO-15, H&P Method TO-15, EPA Method 8260B and H&P 8260SV.

H&P is approved by the State of Arizona as an Environmental Testing Laboratory and Mobile Laboratory, certification numbers AZM758 and AZ0779.

H&P is approved by the State of California as an Environmental Laboratory and Mobile Laboratory in conformance with the Environmental Laboratory Accreditation Program (ELAP) for the category of Volatile and Semi-Volatile Organic Chemistry of Hazardous Waste, certification numbers 2740, 2741, 2743, 2744, 2745, 2754 & 2930.

H&P is approved by the State of Florida Department of Health under the National Environmental Laboratory Accreditation Conference (NELAC) certification number E871100.

The complete list of stationary and mobile laboratory certifications along with the fields of testing (FOTs) and analyte lists are available at www.handpmg.com/about/certifications.

H&P Mobile Geochemistry, Inc.

2470 Impala Drive, Carlsbad, CA 92010
& Field Office - Signal Hill, CA
W handpmg.com E info@handpmg.com
P 760.804.9678 F 760.804.9159

VAPOR / AIR Chain of Custody

DATE: 04/14/17
Page 1 of 1

Lab Client and Project Information

Lab Client/Consultant: Kennedy/Jenks Consultants	Project Name / #: 1796004*00
Lab Client Project Manager: Josh Hopp	Project Location: Yakima, WA
Lab Client Address: 32001 32nd Ave S, Suite 100	Report E-Mail(s): JoshHopp@KennedyJenks.com
Lab Client City, State, Zip: Federal Way, WA 98001	
Phone Number: 253-835-6408	

Reporting Requirements
- [x] Standard Report ☐ Level III ☐ Level IV
- [x] Excel EDD ☐ Other EDD:
- ☐ CA Geotracker Global ID:

Turnaround Time
- [x] 5-7 day Stnd ☐ 24-Hr Rush
- ☐ 3-day Rush ☐ Mobile Lab
- ☐ 48-Hr Rush ☐ Other:

Sampler Information
Sampler(s): Josh Hopp
Signature:
Date: 04-14-17

Sample Receipt (Lab Use Only)

Date Rec'd: 4/19/17 Control #: 170298.01
H&P Project # KJ041917-12
Lab Work Order # E704092
Sample Intact: [x] Yes ☐ No ☐ See Notes Below
Receipt Gauge ID: 11167 Temp: 22°
Outside Lab:
Receipt Notes/Tracking #: 1Z93T761 87 5145 2957
Lab PM Initials: SRN

Additional Instructions to Laboratory: Project Analyte list attached - SN 4/20/17

* Preferred VOC units (please choose one):
☐ µg/L [x] µg/m³ ☐ ppbv ☐ ppmv

SAMPLE NAME	FIELD POINT NAME (if applicable)	DATE mm/dd/yy	TIME 24hr clock	SAMPLE TYPE Indoor Air (IA), Ambient Air (AA), Subslab (SS), Soil Vapor (SV)	CONTAINER SIZE & TYPE 400mL/1L/6L Summa, Tedlar, Tube, etc.	CONTAINER ID (###)	Lab use only: Receipt Vac	VOCs Standard Full List ☐ 8260SV ☐ TO-15	VOCs Short List (Project List) ☐ 8260SV ☐ TO-15	Oxygenates ☐ 8260SV ☐ TO-15	Naphthalene ☐ 8260SV ☐ TO-15	TPHv as Gas ☐ 8260SVm ☐ TO-15m	Aromatic/Aliphatic Fractions ☐ 8260SVm ☐ TO-15m	Leak Check Compound ☐ DFA ☐ IPA ☐ He	Methane by EPA 8015m	Fixed Gases by ASTM D1945 ☐ CO2 ☐ O2 ☐ N2				
FW-Influent-090		04/14/17	0830	SV	1L Summa	090	-2.46		X											
FW-Btwn-249		↓	0840	↓	↓	249	.13		X											
FW-Effluent-150		↓	0845	↓	↓	150	-.17		X											

Approved/Relinquished by:	Company: EJ	Date: 04/17/17	Time: 1130 to VRS	Received by: H Nguyen	Company: H&P	Date: 4/19/17	Time: 1015
Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:
Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:

*Approval constitutes as authorization to proceed with analysis and acceptance of conditions on back

H&P Mobile Geochemistry Inc.

2470 Impala Drive, Carlsbad, CA 92010
Los Angeles Field Office in Signal Hill, CA
Ph: 800-834-9888 www.handpmg.com

KJ041917-12

EPA Method TO-15 (400mL Summa Canister)

Analyte	*CAS #*	*400mL RL/LOQ Vapor (µg/m³)*	*400mL RL/LOQ Vapor (ppbv)*
Vinyl chloride	75-01-4	2.6	1.0
Methylene chloride (Dichloromethane)	75-09-2	3.5	1.0
trans-1,2-Dichloroethene	156-60-5	8.0	2.0
cis-1,2-Dichloroethene	156-59-2	4.0	1.0
Chloroform	67-66-3	4.9	1.0
1,2-Dichloroethane (EDC)	107-06-2	4.1	1.0
Benzene	71-43-2	3.2	1.0
Trichloroethene	79-01-6	5.5	1.0
Toluene	108-88-3	3.8	1.0
Tetrachloroethene	127-18-4	6.9	1.0
Ethylbenzene	100-41-4	4.4	1.0
m,p-Xylene	179601-23-1	8.8	2.0
o-Xylene	95-47-6	4.4	1.0

Mobile Geochemistry Inc.

21 June 2016

Mr. Josh Hopp
Kennedy/Jenks Consultants - Washington
32001 32nd Ave. South, Suite 100
Federal Way, WA 98001

H&P Project: KJ061316-14
Client Project: 1196016.00 task 8 / Frank Wear

Dear Mr. Josh Hopp:

Enclosed is the analytical report for the above referenced project. The data herein applies to samples as received by H&P Mobile Geochemistry, Inc. on 13-Jun-16 which were analyzed in accordance with the attached Chain of Custody record(s).

The results for all sample analyses and required QA/QC analyses are presented in the following sections and summarized in the documents:

- Sample Summary
- Case Narrative (if applicable)
- Sample Results
- Quality Control Summary
- Notes and Definitions / Appendix
- Chain of Custody
- Sampling Logs (if applicable)

Unless otherwise noted, I certify that all analyses were performed and reviewed in compliance with our Quality Systems Manual and Standard Operating Procedures. This report shall not be reproduced, except in full, without the written approval of H&P Mobile Geochemistry, Inc.

We at H&P Mobile Geochemistry, Inc. sincerely appreciate the opportunity to provide analytical services to you on this project. If you have any questions or concerns regarding this analytical report, please contact me at your convenience at 760-804-9678.

Sincerely,

Janis Villarreal

Janis Villarreal
Laboratory Director

H&P Mobile Geochemistry, Inc. is certified under the California ELAP, the National Environmental Laboratory Accreditation Conference (NELAC) and the Department of Defense Accreditation Programs.

H&P Mobile
Geochemistry Inc.

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Kennedy/Jenks Consultants - Washington	Project: KJ061316-14	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 task 8 / Frank Wear	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	21-Jun-16 08:28

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FW-Effluent-005	E606049-01	Vapor	08-Jun-16	13-Jun-16

H&P Mobile
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Kennedy/Jenks Consultants - Washington	Project: KJ061316-14	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 task 8 / Frank Wear	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	21-Jun-16 08:28

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
FW-Effluent-005 (E606049-01) Vapor	**Sampled: 08-Jun-16**	**Received: 13-Jun-16**							
Vinyl chloride	ND	2.6	ug/m3	1	EF61706	17-Jun-16	17-Jun-16	EPA TO-15	
Methylene chloride (Dichloromethane)	ND	3.5	"	"	"	"	"	"	
trans-1,2-Dichloroethene	**8.0**	8.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	**120**	4.0	"	"	"	"	"	"	
Chloroform	ND	4.9	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	4.1	"	"	"	"	"	"	
Benzene	**110**	3.2	"	"	"	"	"	"	
Trichloroethene	**210**	5.5	"	"	"	"	"	"	
Toluene	**7.1**	3.8	"	"	"	"	"	"	
Tetrachloroethene	ND	6.9	"	"	"	"	"	"	
Ethylbenzene	ND	4.4	"	"	"	"	"	"	
m,p-Xylene	ND	8.8	"	"	"	"	"	"	
o-Xylene	ND	4.4	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*107 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*101 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*101 %*		*77-127*	"	"	"	"	

H&P Mobile
Geochemistry Inc.

2470 Impala Drive
Carlsbad, CA 92010
760-804-9678 Phone
760-804-9159 Fax

Kennedy/Jenks Consultants - Washington	Project: KJ061316-14	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 task 8 / Frank Wear	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	21-Jun-16 08:28

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EF61706 - TO-15										
Blank (EF61706-BLK1)				Prepared & Analyzed: 17-Jun-16						
Vinyl chloride	ND	2.6	ug/m3							
Methylene chloride (Dichloromethane)	ND	3.5	"							
trans-1,2-Dichloroethene	ND	8.0	"							
cis-1,2-Dichloroethene	ND	4.0	"							
Chloroform	ND	4.9	"							
1,2-Dichloroethane (EDC)	ND	4.1	"							
Benzene	ND	3.2	"							
Trichloroethene	ND	5.5	"							
Toluene	ND	3.8	"							
Tetrachloroethene	ND	6.9	"							
Ethylbenzene	ND	4.4	"							
m,p-Xylene	ND	8.8	"							
o-Xylene	ND	4.4	"							
Surrogate: 1,2-Dichloroethane-d4	*43.6*		*"*	*42.9*		*102*	*76-134*			
Surrogate: Toluene-d8	*41.8*		*"*	*41.4*		*101*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*69.6*		*"*	*72.9*		*95.5*	*77-127*			
LCS (EF61706-BS1)				Prepared & Analyzed: 17-Jun-16						
Vinyl chloride	11	2.6	ug/m3	10.4		107	64-127			
Methylene chloride (Dichloromethane)	14	3.5	"	14.2		101	62-115			
trans-1,2-Dichloroethene	16	8.0	"	16.2		98.8	67-124			
cis-1,2-Dichloroethene	17	4.0	"	16.0		106	70-121			
Chloroform	22	4.9	"	19.8		109	68-123			
1,2-Dichloroethane (EDC)	18	4.1	"	16.5		108	65-128			
Benzene	14	3.2	"	13.0		110	69-119			
Trichloroethene	23	5.5	"	21.9		105	71-123			
Toluene	16	3.8	"	15.4		105	66-119			
Tetrachloroethene	31	6.9	"	27.6		113	66-124			
Ethylbenzene	21	4.4	"	17.7		119	70-124			
m,p-Xylene	21	8.8	"	17.7		119	61-134			
o-Xylene	20	4.4	"	17.7		114	67-125			
Surrogate: 1,2-Dichloroethane-d4	*41.6*		*"*	*42.9*		*97.1*	*76-134*			

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Kennedy/Jenks Consultants - Washington	Project: KJ061316-14	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 task 8 / Frank Wear	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	21-Jun-16 08:28

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EF61706 - TO-15										
LCS (EF61706-BS1)				Prepared & Analyzed: 17-Jun-16						
Surrogate: Toluene-d8	*38.8*		*ug/m3*	*41.4*		*93.7*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*73.5*		*"*	*72.9*		*101*	*77-127*			
LCS Dup (EF61706-BSD1)				Prepared & Analyzed: 17-Jun-16						
Vinyl chloride	11	2.6	ug/m3	10.4		108	64-127	0.463	25	
Methylene chloride (Dichloromethane)	16	3.5	"	14.2		114	62-115	12.3	25	
trans-1,2-Dichloroethene	16	8.0	"	16.2		101	67-124	2.49	25	
cis-1,2-Dichloroethene	17	4.0	"	16.0		106	70-121	0.474	25	
Chloroform	22	4.9	"	19.8		111	68-123	1.36	25	
1,2-Dichloroethane (EDC)	18	4.1	"	16.5		108	65-128	0.692	25	
Benzene	13	3.2	"	13.0		98.1	69-119	11.1	25	
Trichloroethene	24	5.5	"	21.9		107	71-123	1.87	25	
Toluene	17	3.8	"	15.4		108	66-119	3.04	25	
Tetrachloroethene	32	6.9	"	27.6		115	66-124	1.98	25	
Ethylbenzene	21	4.4	"	17.7		119	70-124	0.209	25	
m,p-Xylene	21	8.8	"	17.7		121	61-134	1.86	25	
o-Xylene	20	4.4	"	17.7		116	67-125	1.51	25	
Surrogate: 1,2-Dichloroethane-d4	*42.2*		*"*	*42.9*		*98.5*	*76-134*			
Surrogate: Toluene-d8	*40.0*		*"*	*41.4*		*96.6*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*72.8*		*"*	*72.9*		*99.9*	*77-127*			

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Kennedy/Jenks Consultants - Washington	Project: KJ061316-14	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 task 8 / Frank Wear	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	21-Jun-16 08:28

Notes and Definitions

LCC	Leak Check Compound
ND	Analyte NOT DETECTED at or above the reporting limit
MDL	Method Detection Limit
%REC	Percent Recovery
RPD	Relative Percent Difference

Appendix

H&P Mobile Geochemistry, Inc. is approved as an Environmental Testing Laboratory and Mobile Laboratory in accordance with the DoD-ELAP and the ISO 17025 programs, certification number L11-175.

H&P is approved by the State of Arizona as an Environmental Testing Laboratory and Mobile Laboratory, certification numbers AZM758 and AZ0779.

H&P is approved by the State of California as an Environmental Laboratory and Mobile Laboratory in conformance with the Environmental Laboratory Accreditation Program (ELAP) for the category of Volatile and Semi-Volatile Organic Chemistry of Hazardous Waste, certification numbers 2740, 2741, 2743, 2744, 2745, 2754 & 2930.

H&P is approved by the State of Florida Department of Health under the National Environmental Laboratory Accreditation Conference (NELAC) certification number E871100.

The complete list of stationary and mobile laboratory certifications along with the fields of testing (FOTs) and analyte lists are available at www.handpmg.com/about/certifications.

H&P Mobile Geochemistry, Inc.
2470 Impala Drive, Carlsbad, CA 92010
& Field Office - Signal Hill, CA
W handpmg.com E info@handpmg.com
P 760.804.9678 F 760.804.9159

VAPOR / AIR Chain of Custody

DATE: 6/8/16
Page 1 of 1

Lab Client and Project Information

Lab Client/Consultant: Kennedy/Jenks Consultants	Project Name / #: Frank Wear 1196016.00 task 8
Lab Client Project Manager: Josh Hopp	Project Location: Yakima, WA
Lab Client Address: 32001, 32nd Ave S, ste 100	Report E-Mail(s): Josh.Hopp@KennedyJenks.com
Lab Client City, State, Zip: Federal Way, WA, 98001	
Phone Number: 253-835-6408	

Reporting Requirements	Turnaround Time	Sampler Information
☒ Standard Report ☐ Level III ☐ Level IV	☒ 5-7 day Stnd ☐ 24-Hr Rush	Sampler(s): Kyle Parker
☒ Excel EDD ☐ Other EDD:_____	☐ 3-day Rush ☐ Mobile Lab	Signature:
☐ CA Geotracker Global ID:_____	☐ 48-Hr Rush ☐ Other:____	Date: 6-8-16

Sample Receipt (Lab Use Only)

Date Rec'd: 6/13/16	Control #: 1604496.01
H&P Project # KJ061316-14	
Lab Work Order # E606049	
Sample Intact: ☒ Yes ☐ No ☐ See Notes Below	
Receipt Gauge ID: 11167	Temp: RT
Outside Lab:	
Receipt Notes/Tracking #: 1293TT6187515555087	
Lab PM Initials: KM for KRI	

Additional Instructions to Laboratory:

☒ Check if Project Analyte List is Attached KM 6/13/16

Preferred VOC units (please choose one):

☐ µg/L ☒ µg/m³ ☐ ppbv ☐ ppmv

SAMPLE NAME	FIELD POINT NAME (if applicable)	DATE mm/dd/yy	TIME 24hr clock	SAMPLE TYPE Indoor Air (IA), Ambient Air (AA), Subslab (SS), Soil Vapor (SV)	CONTAINER SIZE & TYPE 400mL/1L/6L Summa or Tedlar or Tube	CONTAINER ID (###)	Lab use only: Receipt Vac	VOCs Standard Full List ☐ 8260SV ☐ TO-15	VOCs Short List / Project List ☒ 8260SV ☒ TO-15	Oxygenates ☐ 8260SV ☐ TO-15	Naphthalene ☐ 8260SV ☐ TO-15 ☐ TO-17m	TPHv as Gas ☐ 8260SVm ☐ TO-15m	TPHv as Diesel (sorbent tube) ☐ TO-17m	Aromatic/Aliphatic Fractions ☐ 8260SVm ☐ TO-15m	Leak Check Compound ☐ DFA ☐ IPA ☐ He	Methane by EPA 8015m	Fixed Gases by ASTM D1945 ☐ CO2 ☐ O2 ☐ N2			
FW-Effluent-005	Effluent	6/08/16	0922	SV	400 mL	005	-1.87		X										

Approved/Relinquished by: Kyle Parker	Company: WA DOE	Date: 6/8/16	Time: 1045	Received by: Jon Unsworth	Company: H&P	Date: 6/13/16	Time: 10:10
Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:
Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:

*Approval constitutes as authorization to proceed with analysis and acceptance of conditions on back

Rev 08/18/2014

H&P Mobile Geochemistry Inc.

2470 Impala Drive, Carlsbad, CA 92010
Los Angeles Field Office in Signal Hill, CA
Ph: 800-834-9888 www.handpmg.com

EPA Method TO-15 (400mL Summa Canister)

Analyte	*CAS #*	*400mL RL/LOQ Vapor (µg/m³)*	*400mL RL/LOQ Vapor (ppbv)*
Vinyl chloride	75-01-4	2.6	1.0
Methylene chloride (Dichloromethane)	75-09-2	3.5	1.0
trans-1,2-Dichloroethene	156-60-5	8.0	2.0
cis-1,2-Dichloroethene	156-59-2	4.0	1.0
Chloroform	67-66-3	4.9	1.0
1,2-Dichloroethane (EDC)	107-06-2	4.1	1.0
Benzene	71-43-2	3.2	1.0
Trichloroethene	79-01-6	5.5	1.0
Toluene	108-88-3	3.8	1.0
Tetrachloroethene	127-18-4	6.9	1.0
Ethylbenzene	100-41-4	4.4	1.0
m,p-Xylene	179601-23-1	8.8	2.0
o-Xylene	95-47-6	4.4	1.0

Appendix C

Hazardous Waste Manifest

CN# : 041R

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	WAD 980980692	1	(509)412-0671	014268898 JJK

GENERATOR

5. Generator's Name and Mailing Address
State of Washington Dept. of Energy
15 W. Yakima Ave.
Yakima, WA 98902
Generator's Phone: 509-454-7834

Generator's Site Address (if different than mailing address)
Washington Dept. of Energy
106 South 3rd Ave. (vacant lot)
Yakima, WA 98902

6. Transporter 1 Company Name: Hwy. West Environmental Group Inc.
U.S. EPA ID Number: NYD 980769947

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

8. Designated Facility Name and Site Address
Calgon Carbon Corp.
Route 23, Big Sandy Plant
Catlettsburg, KY 41129
Facility's Phone: 606-739-8681
U.S. EPA ID Number: KYD 005009923

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. NA 3077, [illegible], NOS, 9, III	4	BA	4000	P	F002 D001
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
N/A

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

Generator's/Offeror's Printed/Typed Name: Kyle Tank
Signature:
Month: 04 Day: 14 Year: 17

INT'L

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

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: ROBERT LEMAY
Signature:
Month: 04 Day: 14 Year: 17

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

DESIGNATED FACILITY

18. Discrepancy

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

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

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

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

1.	2.	3.	4.

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

Printed/Typed Name: David Halley for CCC
Signature:
Month: 04 Day: 28 Year: 17

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

TRANSPORTER'S COPY

Appendix D

Indoor Air and Subslab Sampling Field Logs

Ecology Former Frank Wear Site (Yakima, WA)
FIELD INDOOR AIR SAMPLING LOG

Project No.: 1196016.00

Date: 04-14-17

Sampling Location ID: Former Buckle My Shoes Early Learning Center (Learning Tree)

Sampling Personnel: Josh Hopp

Weather conditions (Note approximate wind speed/direction, rain, and temperature): Partly sunny, 35°F-60°F, no precip wind from West ~5mph

Number of canisters placed in building: 2 inside, 1 outside

Location of canister(s) within building: M1 located on shelf near north wall of building + M3 located on a small table in the south portion of building, near building-center wall; AMB outside @ NW corner of fenced area

Location of duplicate sample(s), if taken: none

Sample ID	Canister serial no.	Flow controller serial no.	Temp. at sample	LAB initial vacuum of canister (in.	FIELD Initial vacuum of canister	Sample start time	Sample end time	Final vacuum of canister (in. Hg)
BMS-M1-041417	6L0482	FC00471	~70°F	—	-30+	0718	1831	-14
BMS-M3-041417	6L0[illegible]7	FC 0065	~70°F	—	-30+	0720	1833	-11
AMB-UPWIND-041417	6L0405	FC0[illegible]91	~35°F	—	-29	0722	1835	-0

Comments (Odors present, smoking, windows/doors open during sampling, etc.): Occupant indicated they still use similar cleaning products as before

Kennedy/Jenks Consultants

Subslab and Soil Vapor Survey Log Sheet

Project Name / Location: Ecology Frank Wear, Yakima WA **Date:** 04-14-17

Client: Kyle Parker **Field Representative(s):** Josh Hopp **Arrival Time:**

Samplers Name: Josh Hopp **Departure Time:**

Weather / Site Conditions: Partly sunny, 35-60°F, no precip, light wind from West ~5mph

Sample ID	Installation Time	Canister/ Controller No.	Sample Collection		Probe Depth (ft)	Tubing Length (ft)	Purge Volume (mL)	Sample Volume (mL)	Flow Rate (mL/min)	Summa Vacuum Pressure (in Hg)		Tracer Gas Concentrations			Shut-In Test <100" H_2O	Probe Vacuum Pressure <100" H_2O
			Start Time	End Time						Initial	Final	Initial Shroud Conc. (%)	Final Shroud Conc. (%)	Sample (%)		
BMS-SS-1-041417	—	500/113	1523	1613	5S	2	200	6L	200	-27	-5	71%	~	0	✓	—
BMS-SS-5-041417	—	478/43	1620	1708	SS	2	200	6L	200	-29	-5	51%	—	2%	✓	→

Probe Installation Materials

Filter: None

Tubing: Vapor Pin

Termination: Barb

Probe Construction Specifications

Borehole Diam:

Subslab Sand Pack:

Soil Gas Sand Pack:

PV's 1' 1/4-inch tubing = 5 ml 1' 1/8-inch tubing = 1 ml

Field Notes:

Appendix E

Indoor Air and Subslab Sampling Laboratory Analytical Reports
and Chain-of-Custody Documentation

eurofins | Air Toxics

1/25/2016
Mr. Josh Hopp
Kennedy Jenks Consultants
32001 32nd Avenue South
Suite 100
Federal Way WA 98001

Project Name: WDOE Yakima
Project #: 1196016.00 Task9
Workorder #: 1601119

Dear Mr. Josh Hopp

The following report includes the data for the above referenced project for sample(s) received on 1/12/2016 at Air Toxics Ltd.

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

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

Regards,

Kelly Buettner

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1601119

Work Order Summary

CLIENT:	Mr. Josh Hopp Kennedy Jenks Consultants 32001 32nd Avenue South Suite 100 Federal Way, WA 98001	**BILL TO:**	Mr. Josh Hopp Kennedy Jenks Consultants 32001 32nd Avenue South Suite 100 Federal Way, WA 98001
PHONE:	253-874-0555	**P.O. #**	
FAX:	253-952-3435	**PROJECT #**	1196016.00 Task9 WDOE Yakima
DATE RECEIVED:	01/12/2016	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	01/25/2016		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	BMS-M1-010716	Modified TO-15	0.8 "Hg	4.9 psi
01B	BMS-M1-010716	Modified TO-15	0.8 "Hg	4.9 psi
02A	BMS-M3-010716	Modified TO-15	0.8 "Hg	4.8 psi
02B	BMS-M3-010716	Modified TO-15	0.8 "Hg	4.8 psi
03A	AMB-UPWIND-010716	Modified TO-15	5.7 "Hg	5.1 psi
03B	AMB-UPWIND-010716	Modified TO-15	5.7 "Hg	5.1 psi
04A	Lab Blank	Modified TO-15	NA	NA
04B	Lab Blank	Modified TO-15	NA	NA
05A	CCV	Modified TO-15	NA	NA
05B	CCV	Modified TO-15	NA	NA
06A	LCS	Modified TO-15	NA	NA
06AA	LCSD	Modified TO-15	NA	NA
06B	LCS	Modified TO-15	NA	NA
06BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Mayes DATE: 01/25/16

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 956
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15 Full Scan/SIM
Kennedy Jenks Consultants
Workorder# 1601119

Three 6 Liter Summa Special (SIM Certified) samples were received on January 12, 2016. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the Full Scan and SIM acquisition modes. The method involves concentrating up to 1.0 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

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

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
ICAL %RSD acceptance criteria	</=30% RSD with 2 compounds allowed out to < 40% RSD	For Full Scan: 30% RSD with 4 compounds allowed out to < 40% RSD For SIM: Project specific; default criteria is </=30% RSD with 10% of compounds allowed out to < 40% RSD
Daily Calibration	+- 30% Difference	For Full Scan: </= 30% Difference with four allowed out up to </=40%.; flag and narrate outliers For SIM: Project specific; default criteria is </= 30% Difference with 10% of compounds allowed out up to </=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

The results for each sample in this report were acquired from two separate data files originating from the same analytical run. The two data files have the same base file name and are differentiated with a "sim" extension on the SIM data file.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

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

N - The identification is based on presumptive evidence.

CN - See case narrative explanation

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

eurofins | Air Toxics

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

Client Sample ID: BMS-M1-010716

Lab ID#: 1601119-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.14	0.18	0.67	0.86

Client Sample ID: BMS-M1-010716

Lab ID#: 1601119-01B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.068	0.86	0.22	2.8
1,2-Dichloroethane	0.027	0.16	0.11	0.64
Trichloroethene	0.0041	0.020	0.022	0.11
Toluene	0.027	2.6	0.10	9.6
Tetrachloroethene	0.027	0.11	0.18	0.74
Ethyl Benzene	0.027	0.72	0.12	3.1
m,p-Xylene	0.055	2.1	0.24	9.3
o-Xylene	0.027	0.62	0.12	2.7

Client Sample ID: BMS-M3-010716

Lab ID#: 1601119-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.14	0.19	0.66	0.93

Client Sample ID: BMS-M3-010716

Lab ID#: 1601119-02B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.068	0.88	0.22	2.8
1,2-Dichloroethane	0.027	0.16	0.11	0.65
Trichloroethene	0.0041	0.024	0.022	0.13
Toluene	0.027	2.5	0.10	9.4
Tetrachloroethene	0.027	0.11	0.18	0.74
Ethyl Benzene	0.027	0.71	0.12	3.1
m,p-Xylene	0.054	2.1	0.24	9.2

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Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

Client Sample ID: BMS-M3-010716

Lab ID#: 1601119-02B

o-Xylene	0.027	0.62	0.12	2.7

Client Sample ID: AMB-UPWIND-010716

Lab ID#: 1601119-03A

No Detections Were Found.

Client Sample ID: AMB-UPWIND-010716

Lab ID#: 1601119-03B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.083	0.78	0.26	2.5
Trichloroethene	0.0050	0.064	0.027	0.34
Toluene	0.033	2.3	0.12	8.5
Tetrachloroethene	0.033	0.19	0.22	1.3
Ethyl Benzene	0.033	0.32	0.14	1.4
m,p-Xylene	0.066	1.1	0.29	4.8
o-Xylene	0.033	0.41	0.14	1.8

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Client Sample ID: BMS-M1-010716

Lab ID#: 1601119-01A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011318**	**Date of Collection: 1/7/16 1:15:00 PM**	
Dil. Factor:	**1.37**	**Date of Analysis: 1/13/16 10:17 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methylene Chloride	0.27	Not Detected	0.95	Not Detected
Chloroform	0.14	0.18	0.67	0.86

Container Type: 6 Liter Summa Special (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: BMS-M1-010716

Lab ID#: 1601119-01B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011318sim**	**Date of Collection: 1/7/16 1:15:00 PM**	
Dil. Factor:	**1.37**	**Date of Analysis: 1/13/16 10:17 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.014	Not Detected	0.035	Not Detected
cis-1,2-Dichloroethene	0.027	Not Detected	0.11	Not Detected
Benzene	0.068	0.86	0.22	2.8
1,2-Dichloroethane	0.027	0.16	0.11	0.64
Trichloroethene	0.0041	0.020	0.022	0.11
Toluene	0.027	2.6	0.10	9.6
Tetrachloroethene	0.027	0.11	0.18	0.74
Ethyl Benzene	0.027	0.72	0.12	3.1
m,p-Xylene	0.055	2.1	0.24	9.3
o-Xylene	0.027	0.62	0.12	2.7
trans-1,2-Dichloroethene	0.14	Not Detected	0.54	Not Detected

Container Type: 6 Liter Summa Special (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: BMS-M3-010716

Lab ID#: 1601119-02A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011319**	**Date of Collection:**	**1/7/16 1:16:00 PM**
Dil. Factor:	**1.36**	**Date of Analysis:**	**1/14/16 07:53 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methylene Chloride	0.27	Not Detected	0.94	Not Detected
Chloroform	0.14	0.19	0.66	0.93

Container Type: 6 Liter Summa Special (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: BMS-M3-010716

Lab ID#: 1601119-02B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011319sim**	**Date of Collection:**	**1/7/16 1:16:00 PM**
Dil. Factor:	**1.36**	**Date of Analysis:**	**1/14/16 07:53 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.014	Not Detected	0.035	Not Detected
cis-1,2-Dichloroethene	0.027	Not Detected	0.11	Not Detected
Benzene	0.068	0.88	0.22	2.8
1,2-Dichloroethane	0.027	0.16	0.11	0.65
Trichloroethene	0.0041	0.024	0.022	0.13
Toluene	0.027	2.5	0.10	9.4
Tetrachloroethene	0.027	0.11	0.18	0.74
Ethyl Benzene	0.027	0.71	0.12	3.1
m,p-Xylene	0.054	2.1	0.24	9.2
o-Xylene	0.027	0.62	0.12	2.7
trans-1,2-Dichloroethene	0.14	Not Detected	0.54	Not Detected

Container Type: 6 Liter Summa Special (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: AMB-UPWIND-010716

Lab ID#: 1601119-03A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011320**	**Date of Collection: 1/7/16 6:30:00 PM**	
Dil. Factor:	**1.66**	**Date of Analysis: 1/14/16 08:31 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methylene Chloride	0.33	Not Detected	1.2	Not Detected
Chloroform	0.17	Not Detected	0.81	Not Detected

Container Type: 6 Liter Summa Special (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: AMB-UPWIND-010716

Lab ID#: 1601119-03B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011320sim**	**Date of Collection: 1/7/16 6:30:00 PM**	
Dil. Factor:	**1.66**	**Date of Analysis: 1/14/16 08:31 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.017	Not Detected	0.042	Not Detected
cis-1,2-Dichloroethene	0.033	Not Detected	0.13	Not Detected
Benzene	0.083	0.78	0.26	2.5
1,2-Dichloroethane	0.033	Not Detected	0.13	Not Detected
Trichloroethene	0.0050	0.064	0.027	0.34
Toluene	0.033	2.3	0.12	8.5
Tetrachloroethene	0.033	0.19	0.22	1.3
Ethyl Benzene	0.033	0.32	0.14	1.4
m,p-Xylene	0.066	1.1	0.29	4.8
o-Xylene	0.033	0.41	0.14	1.8
trans-1,2-Dichloroethene	0.17	Not Detected	0.66	Not Detected

Container Type: 6 Liter Summa Special (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1601119-04A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011307**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 1/13/16 01:18 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methylene Chloride	0.20	Not Detected	0.69	Not Detected
Chloroform	0.10	Not Detected	0.49	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1601119-04B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011307sima**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 1/13/16 01:18 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.010	Not Detected	0.026	Not Detected
cis-1,2-Dichloroethene	0.020	Not Detected	0.079	Not Detected
Benzene	0.050	Not Detected	0.16	Not Detected
1,2-Dichloroethane	0.020	Not Detected	0.081	Not Detected
Trichloroethene	0.0030	Not Detected	0.016	Not Detected
Toluene	0.020	Not Detected	0.075	Not Detected
Tetrachloroethene	0.020	Not Detected	0.14	Not Detected
Ethyl Benzene	0.020	Not Detected	0.087	Not Detected
m,p-Xylene	0.040	Not Detected	0.17	Not Detected
o-Xylene	0.020	Not Detected	0.087	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: CCV

Lab ID#: 1601119-05A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011302**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 1/13/16 09:16 AM**	

Compound	%Recovery
Methylene Chloride	104
Chloroform	102

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	92	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: CCV

Lab ID#: 1601119-05B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011302sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 1/13/16 09:16 AM**	

Compound	**%Recovery**
Vinyl Chloride	98
cis-1,2-Dichloroethene	103
Benzene	98
1,2-Dichloroethane	95
Trichloroethene	98
Toluene	106
Tetrachloroethene	101
Ethyl Benzene	113
m,p-Xylene	114
o-Xylene	115
trans-1,2-Dichloroethene	101

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
1,2-Dichloroethane-d4	93	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCS

Lab ID#: 1601119-06A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011303**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 1/13/16 10:01 AM**	

Compound	%Recovery	Method Limits
Methylene Chloride	102	70-130
Chloroform	100	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	93	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCSD

Lab ID#: 1601119-06AA

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011304**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 1/13/16 10:49 AM**	

Compound	%Recovery	Method Limits
Methylene Chloride	102	70-130
Chloroform	101	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	93	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: LCS

Lab ID#: 1601119-06B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011303sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 1/13/16 10:01 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	99	70-130
cis-1,2-Dichloroethene	100	70-130
Benzene	92	70-130
1,2-Dichloroethane	91	70-130
Trichloroethene	94	70-130
Toluene	100	70-130
Tetrachloroethene	98	70-130
Ethyl Benzene	110	70-130
m,p-Xylene	113	70-130
o-Xylene	116	70-130
trans-1,2-Dichloroethene	101	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	92	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCSD

Lab ID#: 1601119-06BB

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20011304sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 1/13/16 10:49 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	98	70-130
cis-1,2-Dichloroethene	100	70-130
Benzene	92	70-130
1,2-Dichloroethane	92	70-130
Trichloroethene	94	70-130
Toluene	100	70-130
Tetrachloroethene	98	70-130
Ethyl Benzene	109	70-130
m,p-Xylene	111	70-130
o-Xylene	114	70-130
trans-1,2-Dichloroethene	102	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	93	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	99	70-130

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

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

Project Manager: Josh Hopp
Collected by: (Print and Sign) Josh Hopp [signature]
Company: Kennedy/Jenks Consultants Email: joshhopp@kennedyjenks.com
Address: 32001 32nd Ave S, Ste 100 City: Federal Way State: WA Zip: 98001
Phone: 253-835-6408 Fax:

Project Info:
P.O. #:
Project #: 1196016.00 Task 9
Project Name: WDOE Yakima

Turn Around Time: ☒ Normal ☐ Rush ____ specify

Lab Use Only: Pressurized by: Date: Pressurization Gas: N₂ He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	BMS-M4-010716	[illegible]	01/07/16	0705-1315	TO-15 *	-30+	-6		
02A	BMS-M3-010716	[illegible]		0707-1330	↓	-30+	-6		
03A	BMS-UPWIND-010716	[illegible]	↓	0710-1530	↓	-29	-7		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
[signature]	1/8/16 1530	[signature] EATL	1-12-16 1155
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes:
*Project-specific analyte list
* M4+M3 were not retrieved until 24 hrs later due to building access issues.

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	UPS		n/a	Good	Yes No None	1601119

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5/1/2017
Mr. Josh Hopp
Kennedy Jenks Consultants
32001 32nd Avenue South
Suite 100
Federal Way WA 98001

Project Name: WDOE YAKIMA
Project #: 1796004.00
Workorder #: 1704303

Dear Mr. Josh Hopp

The following report includes the data for the above referenced project for sample(s) received on 4/19/2017 at Air Toxics Ltd.

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

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

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1704303

Work Order Summary

CLIENT:	Mr. Josh Hopp Kennedy Jenks Consultants 32001 32nd Avenue South Suite 100 Federal Way, WA 98001	**BILL TO:**	Mr. Josh Hopp Kennedy Jenks Consultants 32001 32nd Avenue South Suite 100 Federal Way, WA 98001
PHONE:	253-874-0555	**P.O. #**	
FAX:	253-952-3435	**PROJECT #**	1796004.00 WDOE YAKIMA
DATE RECEIVED:	04/19/2017	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	04/25/2017		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	BMS-M1-041417	Modified TO-15	8.6 "Hg	4.9 psi
01B	BMS-M1-041417	Modified TO-15	8.6 "Hg	4.9 psi
02A	BMS-M3-041417	Modified TO-15	9.6 "Hg	4.6 psi
02B	BMS-M3-041417	Modified TO-15	9.6 "Hg	4.6 psi
03A	AMB-UPWIND-041417	Modified TO-15	0.2 psi	5 psi
03B	AMB-UPWIND-041417	Modified TO-15	0.2 psi	5 psi
04A	Lab Blank	Modified TO-15	NA	NA
04B	Lab Blank	Modified TO-15	NA	NA
05A	CCV	Modified TO-15	NA	NA
05B	CCV	Modified TO-15	NA	NA
06A	LCS	Modified TO-15	NA	NA
06AA	LCSD	Modified TO-15	NA	NA
06B	LCS	Modified TO-15	NA	NA
06BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY:  DATE: 05/01/17

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-16-11, UT NELAP CA0093332016-7, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2016, Expiration date: 10/17/2017.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

LABORATORY NARRATIVE
Modified TO-15 Full Scan/SIM
Kennedy Jenks Consultants
Workorder# 1704303

Three 6 Liter Summa Canister (SIM Certified) samples were received on April 19, 2017. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the Full Scan and SIM acquisition modes. The method involves concentrating up to 1.0 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

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

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
ICAL %RSD acceptance criteria	</=30% RSD with 2 compounds allowed out to < 40% RSD	For Full Scan: 30% RSD with 4 compounds allowed out to < 40% RSD For SIM: Project specific; default criteria is </=30% RSD with 10% of compounds allowed out to < 40% RSD
Daily Calibration	+- 30% Difference	For Full Scan: </= 30% Difference with four allowed out up to </=40%.; flag and narrate outliers For SIM: Project specific; default criteria is </= 30% Difference with 10% of compounds allowed out up to </=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

Despite the use of flow controllers for sample collection, the final canister vacuum for sample AMB-UPWIND-041417 was measured at ambient pressure. These ambient pressure readings were confirmed by the laboratory upon sample receipt.

Analytical Notes

The results for each sample in this report were acquired from two separate data files originating from the same analytical run. The two data files have the same base file name and are differentiated with a "sim" extension on the SIM data file.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

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

N - The identification is based on presumptive evidence.

CN - See case narrative explanation

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

Client Sample ID: BMS-M1-041417

Lab ID#: 1704303-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.19	0.34	0.91	1.6

Client Sample ID: BMS-M1-041417

Lab ID#: 1704303-01B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.094	0.24	0.30	0.77
Toluene	0.037	0.60	0.14	2.2
Ethyl Benzene	0.037	0.072	0.16	0.31
m,p-Xylene	0.075	0.24	0.32	1.0
o-Xylene	0.037	0.11	0.16	0.49

Client Sample ID: BMS-M3-041417

Lab ID#: 1704303-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloroform	0.19	0.30	0.94	1.4

Client Sample ID: BMS-M3-041417

Lab ID#: 1704303-02B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.096	0.23	0.31	0.73
Toluene	0.039	0.56	0.14	2.1
Ethyl Benzene	0.039	0.074	0.17	0.32
m,p-Xylene	0.077	0.24	0.34	1.0
o-Xylene	0.039	0.11	0.17	0.46

Client Sample ID: AMB-UPWIND-041417

Lab ID#: 1704303-03A

No Detections Were Found.

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Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

Client Sample ID: AMB-UPWIND-041417

Lab ID#: 1704303-03B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.066	0.26	0.21	0.82
1,2-Dichloroethane	0.026	0.026 J	0.11	0.10 J
Trichloroethene	0.0066	0.026	0.035	0.14
Toluene	0.026	0.58	0.099	2.2
Ethyl Benzene	0.026	0.061	0.11	0.26
m,p-Xylene	0.053	0.21	0.23	0.93
o-Xylene	0.026	0.084	0.11	0.36

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Client Sample ID: BMS-M1-041417

Lab ID#: 1704303-01A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042113**	**Date of Collection: 4/14/17 6:31:00 PM**	
Dil. Factor:	**1.87**	**Date of Analysis: 4/21/17 05:35 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methylene Chloride	0.37	Not Detected	1.3	Not Detected
Chloroform	0.19	0.34	0.91	1.6

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: BMS-M1-041417

Lab ID#: 1704303-01B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042113sim**	**Date of Collection: 4/14/17 6:31:00 PM**	
Dil. Factor:	**1.87**	**Date of Analysis: 4/21/17 05:35 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.019	Not Detected	0.048	Not Detected
cis-1,2-Dichloroethene	0.037	Not Detected	0.15	Not Detected
Benzene	0.094	0.24	0.30	0.77
1,2-Dichloroethane	0.037	Not Detected	0.15	Not Detected
Trichloroethene	0.0094	Not Detected	0.050	Not Detected
Toluene	0.037	0.60	0.14	2.2
Tetrachloroethene	0.037	Not Detected	0.25	Not Detected
Ethyl Benzene	0.037	0.072	0.16	0.31
m,p-Xylene	0.075	0.24	0.32	1.0
o-Xylene	0.037	0.11	0.16	0.49
trans-1,2-Dichloroethene	0.19	Not Detected	0.74	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: BMS-M3-041417

Lab ID#: 1704303-02A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042114**	**Date of Collection: 4/14/17 6:33:00 PM**	
Dil. Factor:	**1.93**	**Date of Analysis: 4/21/17 06:14 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methylene Chloride	0.39	Not Detected	1.3	Not Detected
Chloroform	0.19	0.30	0.94	1.4

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: BMS-M3-041417

Lab ID#: 1704303-02B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042114sim**	**Date of Collection: 4/14/17 6:33:00 PM**	
Dil. Factor:	**1.93**	**Date of Analysis: 4/21/17 06:14 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.019	Not Detected	0.049	Not Detected
cis-1,2-Dichloroethene	0.039	Not Detected	0.15	Not Detected
Benzene	0.096	0.23	0.31	0.73
1,2-Dichloroethane	0.039	Not Detected	0.16	Not Detected
Trichloroethene	0.0096	Not Detected	0.052	Not Detected
Toluene	0.039	0.56	0.14	2.1
Tetrachloroethene	0.039	Not Detected	0.26	Not Detected
Ethyl Benzene	0.039	0.074	0.17	0.32
m,p-Xylene	0.077	0.24	0.34	1.0
o-Xylene	0.039	0.11	0.17	0.46
trans-1,2-Dichloroethene	0.19	Not Detected	0.76	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: AMB-UPWIND-041417

Lab ID#: 1704303-03A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042116**	**Date of Collection: 4/14/17 6:35:00 PM**	
Dil. Factor:	**1.32**	**Date of Analysis: 4/21/17 07:54 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methylene Chloride	0.26	Not Detected	0.92	Not Detected
Chloroform	0.13	Not Detected	0.64	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	109	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: AMB-UPWIND-041417

Lab ID#: 1704303-03B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042116sim**	**Date of Collection: 4/14/17 6:35:00 PM**	
Dil. Factor:	**1.32**	**Date of Analysis: 4/21/17 07:54 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.013	Not Detected	0.034	Not Detected
cis-1,2-Dichloroethene	0.026	Not Detected	0.10	Not Detected
Benzene	0.066	0.26	0.21	0.82
1,2-Dichloroethane	0.026	0.026 J	0.11	0.10 J
Trichloroethene	0.0066	0.026	0.035	0.14
Toluene	0.026	0.58	0.099	2.2
Tetrachloroethene	0.026	Not Detected	0.18	Not Detected
Ethyl Benzene	0.026	0.061	0.11	0.26
m,p-Xylene	0.053	0.21	0.23	0.93
o-Xylene	0.026	0.084	0.11	0.36
trans-1,2-Dichloroethene	0.13	Not Detected	0.52	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	112	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1704303-04A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042106**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/21/17 12:40 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methylene Chloride	0.20	Not Detected	0.69	Not Detected
Chloroform	0.10	Not Detected	0.49	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	87	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1704303-04B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042106simc**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/21/17 12:40 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.010	Not Detected	0.026	Not Detected
cis-1,2-Dichloroethene	0.020	Not Detected	0.079	Not Detected
Benzene	0.050	Not Detected	0.16	Not Detected
1,2-Dichloroethane	0.020	Not Detected	0.081	Not Detected
Trichloroethene	0.0050	Not Detected	0.027	Not Detected
Toluene	0.020	Not Detected	0.075	Not Detected
Tetrachloroethene	0.020	Not Detected	0.14	Not Detected
Ethyl Benzene	0.020	Not Detected	0.087	Not Detected
m,p-Xylene	0.040	Not Detected	0.17	Not Detected
o-Xylene	0.020	Not Detected	0.087	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: CCV

Lab ID#: 1704303-05A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/21/17 09:07 AM**	

Compound	**%Recovery**
Methylene Chloride	98
Chloroform	102

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: CCV

Lab ID#: 1704303-05B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042102sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/21/17 09:07 AM**	

Compound	%Recovery
Vinyl Chloride	106
cis-1,2-Dichloroethene	106
Benzene	104
1,2-Dichloroethane	100
Trichloroethene	96
Toluene	106
Tetrachloroethene	102
Ethyl Benzene	120
m,p-Xylene	123
o-Xylene	127
trans-1,2-Dichloroethene	103

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: LCS

Lab ID#: 1704303-06A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/21/17 09:54 AM**	

Compound	%Recovery	Method Limits
Methylene Chloride	102	70-130
Chloroform	104	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCSD

Lab ID#: 1704303-06AA

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/21/17 10:40 AM**	

Compound	%Recovery	Method Limits
Methylene Chloride	100	70-130
Chloroform	104	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCS

Lab ID#: 1704303-06B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042103sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/21/17 09:54 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	112	70-130
cis-1,2-Dichloroethene	100	70-130
Benzene	108	70-130
1,2-Dichloroethane	100	70-130
Trichloroethene	101	70-130
Toluene	109	70-130
Tetrachloroethene	105	70-130
Ethyl Benzene	124	70-130
m,p-Xylene	126	70-130
o-Xylene	127	70-130
trans-1,2-Dichloroethene	117	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: LCSD

Lab ID#: 1704303-06BB

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20042104sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/21/17 10:40 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	107	70-130
cis-1,2-Dichloroethene	98	70-130
Benzene	108	70-130
1,2-Dichloroethane	99	70-130
Trichloroethene	100	70-130
Toluene	108	70-130
Tetrachloroethene	104	70-130
Ethyl Benzene	123	70-130
m,p-Xylene	126	70-130
o-Xylene	128	70-130
trans-1,2-Dichloroethene	116	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	105	70-130

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

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

Project Manager: Josh Hopp
Collected by: (Print and Sign) Josh Hopp
Company: Kennedy/Jenks Consultants Email: joshhopp@kennedyjenks.com
Address: 3200 132nd Ave S, Ste 100 City: Federal Way State: WA Zip: 98001
Phone: 253-835-6400 Fax:

Project Info:
P.O. #:
Project #: 1796004.00
Project Name: WDOE YAKIMA

Turn Around Time:
☑ Normal
☐ Rush
specify

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

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	BMS-M1-041417	6L0482	04/14/17	0718-1831	TO-15 Short List	-30+	-14		
02A	BMS-M3-041417	6L0627	↓	0720-1833	↓	-30+	-10		
03A	AMB-UPWIND-041417	6L0405	↓	0722-1835	↓	-29	0		

Relinquished by: (signature) Date/Time: 04/17/17 0830 to [redacted] shipper
Received by: (signature) Date/Time: 4/19/17 11:45
Relinquished by: (signature) Date/Time:
Received by: (signature) Date/Time:
Relinquished by: (signature) Date/Time:
Received by: (signature) Date/Time:

Notes:

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	UPS		N/A	good	Yes No None	1704303

Form 1293 rev.11

H&P Mobile Geochemistry Inc.

20 January 2016

Mr. Josh Hopp
Kennedy/Jenks Consultants - Washington
32001 32nd Ave. South, Suite 100
Federal Way, WA 98001

H&P Project: KJ011216-12
Client Project: 1196016.00 Task 9 / Yakima, WA

Dear Mr. Josh Hopp:

Enclosed is the analytical report for the above referenced project. The data herein applies to samples as received by H&P Mobile Geochemistry, Inc. on 12-Jan-16 which were analyzed in accordance with the attached Chain of Custody record(s).

The results for all sample analyses and required QA/QC analyses are presented in the following sections and summarized in the documents:

- Sample Summary
- Case Narrative (if applicable)
- Sample Results
- Quality Control Summary
- Notes and Definitions / Appendix
- Chain of Custody
- Sampling Logs (if applicable)

Unless otherwise noted, I certify that all analyses were performed and reviewed in compliance with our Quality Systems Manual and Standard Operating Procedures. This report shall not be reproduced, except in full, without the written approval of H&P Mobile Geochemistry, Inc.

We at H&P Mobile Geochemistry, Inc. sincerely appreciate the opportunity to provide analytical services to you on this project. If you have any questions or concerns regarding this analytical report, please contact me at your convenience at 760-804-9678.

Sincerely,

Janis Villarreal

Janis Villarreal
Laboratory Director

H&P Mobile Geochemistry, Inc. is certified under the California ELAP, the National Environmental Laboratory Accreditation Conference (NELAC) and the Department of Defense Accreditation Programs.

H&P Mobile
Geochemistry Inc.

2470 Impala Drive
Carlsbad, CA 92010
760-804-9678 Phone
760-804-9159 Fax

Kennedy/Jenks Consultants - Washington	Project: KJ011216-12	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 9 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	20-Jan-16 13:52

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BMS-SS-1-010716	E601041-01	Vapor	07-Jan-16	12-Jan-16
BMS-SS-5-010716	E601041-02	Vapor	07-Jan-16	12-Jan-16

H&P Mobile
Geochemistry Inc.

2470 Impala Drive
Carlsbad, CA 92010
760-804-9678 Phone
760-804-9159 Fax

Kennedy/Jenks Consultants - Washington	Project: KJ011216-12	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 9 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	20-Jan-16 13:52

DETECTIONS SUMMARY

Sample ID: **BMS-SS-1-010716** Laboratory ID: **E601041-01**

Analyte	Result	Reporting Limit	Units	Method	Notes
Tetrachloroethene	**8.2**	0.69	ug/m3	EPA TO-15	

Sample ID: **BMS-SS-5-010716** Laboratory ID: **E601041-02**

Analyte	Result	Reporting Limit	Units	Method	Notes
Helium (LCC)	**0.25**	0.10	%	ASTM D1945M	
Methylene chloride (Dichloromethane)	**0.63**	0.35	ug/m3	EPA TO-15	
Chloroform	**1.0**	0.25	ug/m3	EPA TO-15	
1,2-Dichloroethane (EDC)	**0.57**	0.41	ug/m3	EPA TO-15	
Benzene	**2.2**	0.16	ug/m3	EPA TO-15	
Toluene	**7.2**	0.76	ug/m3	EPA TO-15	
Tetrachloroethene	**2.6**	0.69	ug/m3	EPA TO-15	
Ethylbenzene	**1.6**	0.44	ug/m3	EPA TO-15	
m,p-Xylene	**4.8**	0.44	ug/m3	EPA TO-15	
o-Xylene	**1.4**	0.44	ug/m3	EPA TO-15	

H&P Mobile
Geochemistry Inc.

2470 Impala Drive
Carlsbad, CA 92010
760-804-9678 Phone
760-804-9159 Fax

Kennedy/Jenks Consultants - Washington	Project: KJ011216-12	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 9 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	20-Jan-16 13:52

Soil Gas and Vapor Analysis

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
BMS-SS-1-010716 (E601041-01) Vapor	**Sampled: 07-Jan-16**	**Received: 12-Jan-16**							
Helium (LCC)	ND	0.10	%	1	EA61317	13-Jan-16	13-Jan-16	ASTM D1945M	
BMS-SS-5-010716 (E601041-02) Vapor	**Sampled: 07-Jan-16**	**Received: 12-Jan-16**							
Helium (LCC)	**0.25**	0.10	%	1	EA61317	13-Jan-16	13-Jan-16	ASTM D1945M	

H&P Mobile
Geochemistry Inc.

2470 Impala Drive
Carlsbad, CA 92010
760-804-9678 Phone
760-804-9159 Fax

Kennedy/Jenks Consultants - Washington	Project: KJ011216-12	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 9 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	20-Jan-16 13:52

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
BMS-SS-1-010716 (E601041-01) Vapor	**Sampled: 07-Jan-16**	**Received: 12-Jan-16**							
Vinyl chloride	ND	0.13	ug/m3	1	EA61408	14-Jan-16	14-Jan-16	EPA TO-15	
Methylene chloride (Dichloromethane)	ND	0.35	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.25	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.41	"	"	"	"	"	"	
Benzene	ND	0.16	"	"	"	"	"	"	
Trichloroethene	ND	0.55	"	"	"	"	"	"	
Toluene	ND	0.76	"	"	"	"	"	"	
Tetrachloroethene	**8.2**	0.69	"	"	"	"	"	"	
Ethylbenzene	ND	0.44	"	"	"	"	"	"	
m,p-Xylene	ND	0.44	"	"	"	"	"	"	
o-Xylene	ND	0.44	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*104 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*102 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*92.1 %*		*77-127*	"	"	"	"	
BMS-SS-5-010716 (E601041-02) Vapor	**Sampled: 07-Jan-16**	**Received: 12-Jan-16**							
Vinyl chloride	ND	0.13	ug/m3	1	EA61408	14-Jan-16	14-Jan-16	EPA TO-15	
Methylene chloride (Dichloromethane)	**0.63**	0.35	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	**1.0**	0.25	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	**0.57**	0.41	"	"	"	"	"	"	
Benzene	**2.2**	0.16	"	"	"	"	"	"	
Trichloroethene	ND	0.55	"	"	"	"	"	"	
Toluene	**7.2**	0.76	"	"	"	"	"	"	
Tetrachloroethene	**2.6**	0.69	"	"	"	"	"	"	
Ethylbenzene	**1.6**	0.44	"	"	"	"	"	"	
m,p-Xylene	**4.8**	0.44	"	"	"	"	"	"	
o-Xylene	**1.4**	0.44	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*104 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*104 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*91.4 %*		*77-127*	"	"	"	"	

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Geochemistry Inc.

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Kennedy/Jenks Consultants - Washington	Project: KJ011216-12	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 9 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	20-Jan-16 13:52

Soil Gas and Vapor Analysis - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA61317 - GC										
Blank (EA61317-BLK1)				Prepared & Analyzed: 13-Jan-16						
Helium (LCC)	ND	0.10	%							

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Kennedy/Jenks Consultants - Washington	Project: KJ011216-12	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 9 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	20-Jan-16 13:52

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA61408 - TO-15										
Blank (EA61408-BLK1)				Prepared & Analyzed: 14-Jan-16						
Vinyl chloride	ND	0.13	ug/m3							
Methylene chloride (Dichloromethane)	ND	0.35	"							
trans-1,2-Dichloroethene	ND	0.40	"							
cis-1,2-Dichloroethene	ND	0.40	"							
Chloroform	ND	0.25	"							
1,2-Dichloroethane (EDC)	ND	0.41	"							
Benzene	ND	0.16	"							
Trichloroethene	ND	0.55	"							
Toluene	ND	0.76	"							
Tetrachloroethene	ND	0.69	"							
Ethylbenzene	ND	0.44	"							
m,p-Xylene	ND	0.44	"							
o-Xylene	ND	0.44	"							
Surrogate: 1,2-Dichloroethane-d4	*44.0*		*"*	*42.9*		*103*	*76-134*			
Surrogate: Toluene-d8	*42.1*		*"*	*41.4*		*102*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*65.7*		*"*	*72.9*		*90.1*	*77-127*			
LCS (EA61408-BS1)				Prepared & Analyzed: 14-Jan-16						
Vinyl chloride	9.2	0.13	ug/m3	10.4		88.0	70-130			
Methylene chloride (Dichloromethane)	14	0.35	"	14.2		102	70-130			
trans-1,2-Dichloroethene	16	0.40	"	16.2		96.2	70-130			
cis-1,2-Dichloroethene	14	0.40	"	16.0		85.6	70-130			
Chloroform	19	0.25	"	19.8		93.6	70-130			
1,2-Dichloroethane (EDC)	15	0.41	"	16.5		91.1	70-130			
Benzene	11	0.16	"	13.0		82.9	70-130			
Trichloroethene	19	0.55	"	21.9		86.3	70-130			
Toluene	13	0.76	"	15.4		85.2	70-130			
Tetrachloroethene	21	0.69	"	27.6		77.0	70-130			
Ethylbenzene	13	0.44	"	17.7		76.2	70-130			
m,p-Xylene	29	0.44	"	35.4		81.9	70-130			
o-Xylene	14	0.44	"	17.7		80.4	70-130			
Surrogate: 1,2-Dichloroethane-d4	*47.1*		*"*	*42.9*		*110*	*76-134*			

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Kennedy/Jenks Consultants - Washington	Project: KJ011216-12	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 9 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	20-Jan-16 13:52

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA61408 - TO-15										
LCS (EA61408-BS1)				Prepared & Analyzed: 14-Jan-16						
Surrogate: Toluene-d8	*42.8*		*ug/m3*	*41.4*		*103*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*65.9*		*"*	*72.9*		*90.4*	*77-127*			
LCS Dup (EA61408-BSD1)				Prepared & Analyzed: 14-Jan-16						
Vinyl chloride	9.7	0.13	ug/m3	10.4		92.9	70-130	5.43	25	
Methylene chloride (Dichloromethane)	13	0.35	"	14.2		95.3	70-130	7.16	25	
trans-1,2-Dichloroethene	15	0.40	"	16.2		90.5	70-130	6.16	25	
cis-1,2-Dichloroethene	14	0.40	"	16.0		84.4	70-130	1.39	25	
Chloroform	18	0.25	"	19.8		90.4	70-130	3.49	25	
1,2-Dichloroethane (EDC)	15	0.41	"	16.5		88.6	70-130	2.75	25	
Benzene	11	0.16	"	13.0		82.9	70-130	0.0301	25	
Trichloroethene	19	0.55	"	21.9		87.0	70-130	0.746	25	
Toluene	13	0.76	"	15.4		83.4	70-130	2.15	25	
Tetrachloroethene	22	0.69	"	27.6		81.0	70-130	5.15	25	
Ethylbenzene	15	0.44	"	17.7		85.5	70-130	11.6	25	
m,p-Xylene	32	0.44	"	35.4		89.6	70-130	9.02	25	
o-Xylene	15	0.44	"	17.7		86.6	70-130	7.50	25	
Surrogate: 1,2-Dichloroethane-d4	*44.3*		*"*	*42.9*		*103*	*76-134*			
Surrogate: Toluene-d8	*41.1*		*"*	*41.4*		*99.4*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*71.6*		*"*	*72.9*		*98.2*	*77-127*			

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Kennedy/Jenks Consultants - Washington	Project: KJ011216-12	
32001 32nd Ave. South, Suite 100	Project Number: 1196016.00 Task 9 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	20-Jan-16 13:52

Notes and Definitions

LCC	Leak Check Compound
ND	Analyte NOT DETECTED at or above the reporting limit
MDL	Method Detection Limit
%REC	Percent Recovery
RPD	Relative Percent Difference

Appendix

H&P Mobile Geochemistry, Inc. is approved as an Environmental Testing Laboratory and Mobile Laboratory in accordance with the DoD-ELAP and the ISO 17025 programs, certification number L11-175.

H&P is approved by the State of Arizona as an Environmental Testing Laboratory and Mobile Laboratory, certification numbers AZM758 and AZ0779.

H&P is approved by the State of California as an Environmental Laboratory and Mobile Laboratory in conformance with the Environmental Laboratory Accreditation Program (ELAP) for the category of Volatile and Semi-Volatile Organic Chemistry of Hazardous Waste, certification numbers 2740, 2741, 2743, 2744, 2745, 2754 & 2930.

H&P is approved by the State of Florida Department of Health under the National Environmental Laboratory Accreditation Conference (NELAC) certification number E871100.

The complete list of stationary and mobile laboratory certifications along with the fields of testing (FOTs) and analyte lists are available at www.handpmg.com/about/certifications.

Mobile Geochemistry, Inc.

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VAPOR / AIR Chain of Custody

1600162.01

DATE: 1/7/16
Page 1 of 1

Lab Client and Project Information

Lab Client/Consultant: Kennedy Jenks Consultants	Project Name / #: Frank Wear 119601G.00 Task9
Lab Client Project Manager: Josh Hopp	Project Location: Yakima, WA
Lab Client Address: 32001 32nd Ave S, Suite 100	Report E-Mail(s):
Lab Client City, State, Zip: Federal Way, WA 98001	josh.hopp@kennedyjenks.com
Phone Number: 253-835-6408	

Reporting Requirements

- [x] Standard Report [ ] Level III [ ] Level IV
- [x] Excel EDD [ ] Other EDD:_____
- [ ] CA Geotracker Global ID:_____

Turnaround Time

- [x] 5-7 day Stnd [ ] 24-Hr Rush
- [ ] 3-day Rush [ ] Mobile Lab
- [ ] 48-Hr Rush [ ] Other:____

Sampler Information

Sampler(s): Josh Hopp
Signature:
Date: 1-7-16

Sample Receipt (Lab Use Only)

Date Rec'd: 1/12/16	Control #: ~~15089~~
H&P Project # KJ01216-12	
Lab Work Order # E601041	
Sample Intact: [x] Yes [ ] No [ ] See Notes Below	
Receipt Gauge ID: ASG 1/12/16 ~~HH671076084~~	Temp: 22°C
Outside Lab:	
Receipt Notes/Tracking #: 1Z93T T6103471 41377 1Z93T T6187473 54383	Lab PM Initials: kim for SLZ

Additional Instructions to Laboratory:

[x] Check if Project Analyte List is ~~Attached~~ previously provided.

Preferred VOC units (please choose one):

[ ] µg/L [x] µg/m³ [ ] ppbv [ ] ppmv

SAMPLE NAME	FIELD POINT NAME (if applicable)	DATE mm/dd/yy	TIME 24hr clock	SAMPLE TYPE Indoor Air (IA), Ambient Air (AA), Subslab (SS), Soil Vapor (SV)	CONTAINER SIZE & TYPE 400mL/1L/6L Summa or Tedlar or Tube	CONTAINER ID (###)	Lab use only: Receipt Vac	VOCs Standard Full List [ ] 8260SV [ ] TO-15	VOCs Short List/ Project List [x] 8260SV [x] TO-15	Oxygenates [ ] 8260SV [ ] TO-15	Naphthalene [ ] 8260SV [ ] TO-15 [ ] TO-17m	TPHv as Gas [ ] 8260SVm [ ] TO-15m	TPHv as Diesel (sorbent tube) [ ] TO-17m	Aromatic/Aliphatic Fractions [ ] 8260SVm [ ] TO-15m	Leak Check Compound [ ] DFA [ ] IPA [x] He	Methane by EPA 8015m	Fixed Gases by ASTM D1945 [ ] CO2 [ ] O2 [ ] N2			
BMS-SS-1-010716		01/07/16	1599	SS	6L Summa	297	-4.96		X						X					
BMS-SS-5-010716		↓	1418	SS	↓	344	-5.36		X						X					

Approved/Relinquished by:	Company: KJCI	Date: 1-7-16	Time: 1900	Received by:	Company: H&P	Date: 1/12/16	Time: 14:45
Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:
Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:

*Approval constitutes as authorization to proceed with analysis and acceptance of conditions on back

Rev 08/18/2014

H&P Mobile Geochemistry Inc.

03 May 2017

Mr. Josh Hopp
Kennedy/Jenks Consultants - Washington
32001 32nd Ave. South, Suite 100
Federal Way, WA 98001

H&P Project: KJ041917-11
Client Project: 1796004.00 / Yakima, WA

Dear Mr. Josh Hopp:

Enclosed is the analytical report for the above referenced project. The data herein applies to samples as received by H&P Mobile Geochemistry, Inc. on 19-Apr-17 which were analyzed in accordance with the attached Chain of Custody record(s).

The results for all sample analyses and required QA/QC analyses are presented in the following sections and summarized in the documents:

- Sample Summary
- Case Narrative (if applicable)
- Sample Results
- Quality Control Summary
- Notes and Definitions / Appendix
- Chain of Custody
- Sampling Logs (if applicable)

Unless otherwise noted, I certify that all analyses were performed and reviewed in compliance with our Quality Systems Manual and Standard Operating Procedures. This report shall not be reproduced, except in full, without the written approval of H&P Mobile Geochemistry, Inc.

We at H&P Mobile Geochemistry, Inc. sincerely appreciate the opportunity to provide analytical services to you on this project. If you have any questions or concerns regarding this analytical report, please contact me at your convenience at 760-804-9678.

Sincerely,

Janis La Roux
Laboratory Director

H&P Mobile Geochemistry, Inc. is certified under the California ELAP and the National Environmental Laboratory Accreditation Conference (NELAC). H&P is approved as an Environmental Testing Laboratory and Mobile Laboratory in accordance with the DoD-ELAP Program and ISO/IEC 17025:2005 programs, accreditation number 69070 for EPA Method TO-15, H&P Method TO-15, EPA Method 8260B and H&P 8260SV.

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Kennedy/Jenks Consultants - Washington	Project: KJ041917-11	
32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BMS-SS-1-041417	E704090-01	Vapor	14-Apr-17	19-Apr-17
BMS-SS-5-041417	E704090-02	Vapor	14-Apr-17	19-Apr-17

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Kennedy/Jenks Consultants - Washington	Project: KJ041917-11	
32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:43

DETECTIONS SUMMARY

Sample ID: **BMS-SS-1-041417** Laboratory ID: **E704090-01**

Analyte	Result	Reporting Limit	Units	Method	Notes
Chloroform	**0.49**	0.25	ug/m3	EPA TO-15	
Benzene	**0.45**	0.16	ug/m3	EPA TO-15	
Toluene	**4.0**	0.76	ug/m3	EPA TO-15	
Tetrachloroethene	**23**	0.69	ug/m3	EPA TO-15	
Ethylbenzene	**0.53**	0.44	ug/m3	EPA TO-15	
m,p-Xylene	**1.3**	0.44	ug/m3	EPA TO-15	
o-Xylene	**0.66**	0.44	ug/m3	EPA TO-15	

Sample ID: **BMS-SS-5-041417** Laboratory ID: **E704090-02**

Analyte	Result	Reporting Limit	Units	Method	Notes
Helium (LCC)	**1.42**	0.10	%	ASTM D1945M	
Methylene chloride (Dichloromethane)	**0.95**	0.35	ug/m3	EPA TO-15	
Chloroform	**1.4**	0.25	ug/m3	EPA TO-15	
Benzene	**1.2**	0.16	ug/m3	EPA TO-15	
Toluene	**5.8**	0.76	ug/m3	EPA TO-15	
Ethylbenzene	**1.0**	0.44	ug/m3	EPA TO-15	
m,p-Xylene	**3.4**	0.44	ug/m3	EPA TO-15	
o-Xylene	**1.4**	0.44	ug/m3	EPA TO-15	

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Kennedy/Jenks Consultants - Washington	Project: KJ041917-11	
32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:43

Soil Gas and Vapor Analysis

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
BMS-SS-1-041417 (E704090-01) Vapor	**Sampled: 14-Apr-17**	**Received: 19-Apr-17**							
Helium (LCC)	ND	0.10	%	1	ED72407	24-Apr-17	24-Apr-17	ASTM D1945M	
BMS-SS-5-041417 (E704090-02) Vapor	**Sampled: 14-Apr-17**	**Received: 19-Apr-17**							
Helium (LCC)	**1.42**	0.10	%	1	ED72407	24-Apr-17	24-Apr-17	ASTM D1945M	

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Kennedy/Jenks Consultants - Washington	Project: KJ041917-11	
32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:43

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
BMS-SS-1-041417 (E704090-01) Vapor	**Sampled: 14-Apr-17**	**Received: 19-Apr-17**							
Vinyl chloride	ND	0.13	ug/m3	1	ED72613	25-Apr-17	26-Apr-17	EPA TO-15	
Methylene chloride (Dichloromethane)	ND	0.35	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	**0.49**	0.25	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.41	"	"	"	"	"	"	
Benzene	**0.45**	0.16	"	"	"	"	"	"	
Trichloroethene	ND	0.55	"	"	"	"	"	"	
Toluene	**4.0**	0.76	"	"	"	"	"	"	
Tetrachloroethene	**23**	0.69	"	"	"	"	"	"	
Ethylbenzene	**0.53**	0.44	"	"	"	"	"	"	
m,p-Xylene	**1.3**	0.44	"	"	"	"	"	"	
o-Xylene	**0.66**	0.44	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*123 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*106 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*91.5 %*		*77-127*	"	"	"	"	
BMS-SS-5-041417 (E704090-02) Vapor	**Sampled: 14-Apr-17**	**Received: 19-Apr-17**							
Vinyl chloride	ND	0.13	ug/m3	1	ED72613	25-Apr-17	26-Apr-17	EPA TO-15	
Methylene chloride (Dichloromethane)	**0.95**	0.35	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	**1.4**	0.25	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.41	"	"	"	"	"	"	
Benzene	**1.2**	0.16	"	"	"	"	"	"	
Trichloroethene	ND	0.55	"	"	"	"	"	"	
Toluene	**5.8**	0.76	"	"	"	"	"	"	
Tetrachloroethene	ND	0.69	"	"	"	"	"	"	
Ethylbenzene	**1.0**	0.44	"	"	"	"	"	"	
m,p-Xylene	**3.4**	0.44	"	"	"	"	"	"	
o-Xylene	**1.4**	0.44	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*115 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*104 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*95.8 %*		*77-127*	"	"	"	"	

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Kennedy/Jenks Consultants - Washington	Project: KJ041917-11	
32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:43

Soil Gas and Vapor Analysis - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch ED72407 - GC										
Blank (ED72407-BLK1)				Prepared & Analyzed: 24-Apr-17						
Helium (LCC)	ND	0.10	%							

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Kennedy/Jenks Consultants - Washington	Project: KJ041917-11	
32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:43

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch ED72613 - TO-15										
Blank (ED72613-BLK1)				Prepared & Analyzed: 25-Apr-17						
Vinyl chloride	ND	0.13	ug/m3							
Methylene chloride (Dichloromethane)	ND	0.35	"							
trans-1,2-Dichloroethene	ND	0.40	"							
cis-1,2-Dichloroethene	ND	0.40	"							
Chloroform	ND	0.25	"							
1,2-Dichloroethane (EDC)	ND	0.41	"							
Benzene	ND	0.16	"							
Trichloroethene	ND	0.55	"							
Toluene	ND	0.76	"							
Tetrachloroethene	ND	0.69	"							
Ethylbenzene	ND	0.44	"							
m,p-Xylene	ND	0.44	"							
o-Xylene	ND	0.44	"							
Surrogate: 1,2-Dichloroethane-d4	*50.6*		*"*	*42.9*		*118*	*76-134*			
Surrogate: Toluene-d8	*43.5*		*"*	*41.4*		*105*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*64.0*		*"*	*72.9*		*87.8*	*77-127*			
LCS (ED72613-BS1)				Prepared & Analyzed: 25-Apr-17						
Vinyl chloride	11	0.13	ug/m3	10.4		105	64-127			
Methylene chloride (Dichloromethane)	15	0.35	"	14.2		109	62-115			
trans-1,2-Dichloroethene	17	0.40	"	16.2		104	67-124			
cis-1,2-Dichloroethene	17	0.40	"	16.0		105	70-121			
Chloroform	20	0.25	"	19.8		102	68-123			
1,2-Dichloroethane (EDC)	18	0.41	"	16.5		106	65-128			
Benzene	13	0.16	"	13.0		103	69-119			
Trichloroethene	21	0.55	"	21.9		95.5	71-123			
Toluene	12	0.76	"	15.4		80.0	66-119			
Tetrachloroethene	23	0.69	"	27.6		83.3	66-124			
Ethylbenzene	15	0.44	"	17.7		83.6	70-124			
m,p-Xylene	15	0.44	"	17.7		82.3	61-134			
o-Xylene	14	0.44	"	17.7		80.1	67-125			
Surrogate: 1,2-Dichloroethane-d4	*50.2*		*"*	*42.9*		*117*	*76-134*			

H&P Mobile
Geochemistry Inc.

2470 Impala Drive
Carlsbad, CA 92010
760-804-9678 Phone
760-804-9159 Fax

Kennedy/Jenks Consultants - Washington	Project: KJ041917-11	
32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:43

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch ED72613 - TO-15										
LCS (ED72613-BS1)				Prepared & Analyzed: 25-Apr-17						
Surrogate: Toluene-d8	*43.5*		*ug/m3*	*41.4*		*105*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*66.1*		*"*	*72.9*		*90.7*	*77-127*			
LCS Dup (ED72613-BSD1)				Prepared & Analyzed: 25-Apr-17						
Vinyl chloride	11	0.13	ug/m3	10.4		105	64-127	0.475	25	
Methylene chloride (Dichloromethane)	15	0.35	"	14.2		104	62-115	4.69	25	
trans-1,2-Dichloroethene	17	0.40	"	16.2		103	67-124	0.966	25	
cis-1,2-Dichloroethene	16	0.40	"	16.0		102	70-121	2.91	25	
Chloroform	20	0.25	"	19.8		101	68-123	1.47	25	
1,2-Dichloroethane (EDC)	17	0.41	"	16.5		102	65-128	4.06	25	
Benzene	13	0.16	"	13.0		97.9	69-119	4.98	25	
Trichloroethene	20	0.55	"	21.9		91.2	71-123	4.53	25	
Toluene	12	0.76	"	15.4		76.3	66-119	4.77	25	
Tetrachloroethene	23	0.69	"	27.6		81.8	66-124	1.81	25	
Ethylbenzene	15	0.44	"	17.7		82.1	70-124	1.80	25	
m,p-Xylene	14	0.44	"	17.7		80.3	61-134	2.45	25	
o-Xylene	14	0.44	"	17.7		77.3	67-125	3.48	25	
Surrogate: 1,2-Dichloroethane-d4	*49.0*		*"*	*42.9*		*114*	*76-134*			
Surrogate: Toluene-d8	*43.2*		*"*	*41.4*		*104*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*65.3*		*"*	*72.9*		*89.6*	*77-127*			

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Kennedy/Jenks Consultants - Washington	Project: KJ041917-11	
32001 32nd Ave. South, Suite 100	Project Number: 1796004.00 / Yakima, WA	Reported:
Federal Way, WA 98001	Project Manager: Mr. Josh Hopp	03-May-17 12:43

Notes and Definitions

LCC	Leak Check Compound
ND	Analyte NOT DETECTED at or above the reporting limit
MDL	Method Detection Limit
%REC	Percent Recovery
RPD	Relative Percent Difference

Appendix

H&P Mobile Geochemistry, Inc. is approved as an Environmental Testing Laboratory and Mobile Laboratory in accordance with the DoD-ELAP Program and ISO/IEC 17025:2005 programs, accreditation number 69070 for EPA Method TO-15, H&P Method TO-15, EPA Method 8260B and H&P 8260SV.

H&P is approved by the State of Arizona as an Environmental Testing Laboratory and Mobile Laboratory, certification numbers AZM758 and AZ0779.

H&P is approved by the State of California as an Environmental Laboratory and Mobile Laboratory in conformance with the Environmental Laboratory Accreditation Program (ELAP) for the category of Volatile and Semi-Volatile Organic Chemistry of Hazardous Waste, certification numbers 2740, 2741, 2743, 2744, 2745, 2754 & 2930.

H&P is approved by the State of Florida Department of Health under the National Environmental Laboratory Accreditation Conference (NELAC) certification number E871100.

The complete list of stationary and mobile laboratory certifications along with the fields of testing (FOTs) and analyte lists are available at www.handpmg.com/about/certifications.

Mobile Geochemistry, Inc.
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VAPOR / AIR Chain of Custody

DATE: 04-14-17
Page 1 of 1

Lab Client and Project Information

Lab Client/Consultant: Kennedy/Jenks Consultants	Project Name / #: 1796004*00
Lab Client Project Manager: Josh Hopp	Project Location: Yakima, WA
Lab Client Address: 32001 32nd Ave S, Suite 100	Report E-Mail(s): JoshHopp@KennedyJenks.com
Lab Client City, State, Zip: Federal Way, WA 98001	
Phone Number: 253-835-6408	

Reporting Requirements
- [X] Standard Report ☐ Level III ☐ Level IV
- [X] Excel EDD ☐ Other EDD:
- ☐ CA Geotracker Global ID:

Turnaround Time
- [X] 5-7 day Stnd ☐ 24-Hr Rush
- ☐ 3-day Rush ☐ Mobile Lab
- ☐ 48-Hr Rush ☐ Other:

Sampler Information
Sampler(s): Josh Hopp
Signature:
Date: 04-14-17

Sample Receipt (Lab Use Only)

Date Rec'd: 4/19/17	Control #: 170299.01
H&P Project # KJ041917-11	
Lab Work Order # E704090	
Sample Intact: [✓] Yes ☐ No ☐ See Notes Below	
Receipt Gauge ID: 612170020	Temp: 22
Outside Lab:	
Receipt Notes/Tracking #: 1Z93TT61 87 5177 7007 5035 3798	
Lab PM Initials: SRN	

Additional Instructions to Laboratory: Project Analyte List attached - SN 4/20/17

* *Preferred VOC units (please choose one):*
☐ µg/L [X] µg/m³ ☐ ppbv ☐ ppmv

SAMPLE NAME	FIELD POINT NAME (if applicable)	DATE mm/dd/yy	TIME 24hr clock	SAMPLE TYPE Indoor Air (IA), Ambient Air (AA), Subslab (SS), Soil Vapor (SV)	CONTAINER SIZE & TYPE 400mL/1L/6L Summa, Tedlar, Tube, etc.	CONTAINER ID (###)	Lab use only: Receipt Vac	VOCs Standard Full List ☐ 8260SV ☐ TO-15	VOCs Short List (Project List) ☐ 8260SV [X] TO-15	Oxygenates ☐ 8260SV ☐ TO-15	Naphthalene ☐ 8260SV ☐ TO-15	TPHv as Gas ☐ 8260SV/m ☐ TO-15m	Aromatic/Aliphatic Fractions ☐ 8260SV/m ☐ TO-15m	Leak Check Compound ☐ DFA ☐ IPA [X] He	Methane by EPA 8015m	Fixed Gases by ASTM D1945 ☐ CO2 ☐ O2 ☐ N2
BMS-SS-1-041917		04/14/17	1613	SS-SV	6L Summa	500	-5.36		X					X		
BMS-SS-5-041417		↓	1708	SS-SV	↓	478	-4.54		X					X		

Approved/Relinquished by:	Company:	Date: 04/14/17	Time: 1730 hours	Received by:	Company: H&P	Date: 4/19/17	Time: 1005
Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:
Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:

*Approval constitutes as authorization to proceed with analysis and acceptance of conditions on back

H&P Mobile Geochemistry Inc.

KJ041917-11

2470 Impala Drive, Carlsbad, CA 92010
Los Angeles Field Office in Signal Hill, CA
Ph: 800-834-9888 www.handpmg.com

EPA Method TO-15 (6-Liter Summa Canister)

Project Analyte List for Kennedy Jenks, Yakima, WA

Analyte	*CAS #*	*6-Liter RL/LOQ Vapor ($\mu g/m^3$)*	*6-Liter RL/LOQ Vapor (ppbv)*
Vinyl chloride	75-01-4	0.13	0.05
Methylene chloride (Dichloromethane)	75-09-2	0.35	0.1
trans-1,2-Dichloroethene	156-60-5	0.40	0.1
cis-1,2-Dichloroethene	156-59-2	0.40	0.1
Chloroform	67-66-3	0.25	0.05
1,2-Dichloroethane (EDC)	107-06-2	0.41	0.1
Benzene	71-43-2	0.32	0.1
Trichloroethene	79-01-6	0.55	0.1
Toluene	108-88-3	0.76	0.2
Tetrachloroethene	127-18-4	0.69	0.1
Ethylbenzene	100-41-4	0.44	0.1
m,p-Xylene	179601-23-1	0.44	0.1
o-Xylene	95-47-6	0.44	0.1

Leak Check Compound

Helium by ASTM D1945 — 0.10%