



SoundEarth Strategies, Inc.
2811 Fairview Avenue East, Suite 2000
Seattle, Washington 98102

August 16, 2018

Mr. Dale Myers
Washington State Department of Ecology
3190 160th Avenue Southeast
Bellevue, Washington 98008

SUBJECT: SECOND QUARTER 2018 SUMMARY REPORT
SKS Shell Station Site
3901 Southwest Alaska Street
Seattle, Washington
Project Number: 0914-001

Dear Mr. Myers:

SoundEarth Strategies, Inc. (SoundEarth) is pleased to present the Washington State Department of Ecology (Ecology) with a status report for the Second Quarter post-cleanup compliance and reporting activities for the SKS Shell Station Site (SKS Site; Figure 1). The construction phase of the cleanup for the SKS Site was implemented in 2015 under the Prospective Purchaser Consent Decree #13-2-27556-2, entered on July 29, 2013 (PPCD). Remediation of petroleum-contaminated soil and groundwater, and post-cleanup groundwater monitoring has been performed in accordance with the PPCD and Chapter 173-340 of the Washington Administrative Code. Cleanup and development activities at the SKS Site included dewatering, extensive soil excavation, and the installation of a vapor barrier to eliminate potential vapor intrusion exposure pathway in the mixed use building constructed on the property. Cleanup of the SKS Site has been coordinated with remedial activities conducted at the adjacent Huling Brothers Property and Kennedy Family Limited Partnership Property, which are being managed separately under the Voluntary Cleanup Program (VCP; NW2716).

SECOND QUARTER 2018 SUMMARY

Groundwater sampling was conducted on June 21 and 22, 2018, for the 12 on-property and off-property compliance wells. The 12 compliance wells include MW108 through MW110 and new well MW113, located in the northeast corner of the building parking garage, and MW101 through MW105 and RW03 through RW05, which are all located within the Fautleroy Way Southwest and Southwest Alaska Street rights-of-way (ROW). A sample collected from MW103 was not analyzed due to insufficient water volume in the casing. This groundwater sampling event is the 10th since cleanup was completed in 2015, and the 5th consecutive in which all wells in the network work were sampled. SoundEarth has uploaded Environmental Information Management (EIM) analytical and location data for the Second Quarter data on July 6, 2018.

Data from the June 2018 sampling event is tabulated below:

Second Quarter 2018 Groundwater Analytical Results

Well ID	Sample Date	Analytical Results (micrograms per liter)		
		GRPH	Benzene	DRPH
MW101	06/21/18	<100	<1	<50
MW102	06/22/18	<100	<1	<50
MW103	06/21/18	Insufficient water to analyze		
MW104	06/21/18	130	<1	720
MW105	06/21/18	<100	<1	<50
MW108	06/21/18	<100	<1	150 ^x
MW109	06/21/18	190	<1	200
MW110	06/21/18	<100	<1	96 ^x
MW113	06/21/18	<100	<1	71 ^x
RW03	06/22/18	730	<1	740^x
RW04	06/21/18	360	<1	400 ^x
RW05	06/21/18	140	<1	180 ^x
MTCA Method A Cleanup Level		1,000/800	5	500

NOTES:

Red denotes concentration exceeds the MTCA cleanup level.

< = not detected above the laboratory reporting limit

DRPH = diesel-range petroleum hydrocarbons

GRPH = gasoline-range petroleum hydrocarbons

MTCA = Washington State Model Toxics Control Act

Laboratory Note:

^xThe sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Please see the attached Groundwater Monitoring Report—Second Quarter 2018 for a more detailed discussion of the results and overall decreasing groundwater concentration trends for the SKS Site over approximately the past year and a half.

Well Installation Status. Installation of wells MW111 and MW112 in the Alaska Street sidewalk was planned for Second Quarter. However, this installation work has been delayed by the Seattle Department of Transportation (SDOT) review of the traffic control plan (TCP). The TCP was submitted to SDOT during First Quarter 2018. In late June, SoundEarth was informed by SDOT that the review could be completed by the end of July. However, SoundEarth requests for a schedule update since August 1 have gone unanswered by SDOT.

Well Decommissioning Work Plan. Ecology approved SoundEarth’s variance request for decommissioning of four remediation wells (RW06 through RW09) and one monitoring well (MW107). The approval letter was issued on July 2, 2018. The closure work is expected to take place in September 2018 (discussed below) using the same TCP plan as the MW111 and MW112 installation. However, the SDOT review of the TCP may have an impact on the decommissioning schedule.

Ecology Status Meeting. SoundEarth attended a status meeting at Ecology’s Northwest Regional Office on July 16, 2018. The meeting was attended by Dale Myers and Mike Warfel of Ecology, Ryan Bixby and

Rob Roberts of SoundEarth, and Dave Cook of Aspect Consulting. It was agreed that the cleanup process is in “monitoring mode” at this time. A summary of the meeting was emailed to Dale Myers on August 9, 2018.

PLANNED THIRD QUARTER 2018 ACTIVITIES

SoundEarth plans to conduct Third Quarter 2018 groundwater sampling in September 2018. Wells MW111 and MW112 are expected to be installed in the Alaska Street sidewalk in late August or early September and sampled during Third Quarter. The well installation schedule is pending approval for the traffic control plan by Seattle Department of Transportation.

Based on Ecology’s approval of the well decommissioning work plans, SoundEarth is moving forward with efforts to decommission the four remediation wells located on Alaska Street (RW06 through RW09) and monitoring well MW107. The decommissioning will be conducted by Cascade Drilling.

Groundwater levels and analytical data trends will continue to be evaluated.

A flow meter will be installed on the building dewatering system outlet to further evaluate the amount of groundwater being captured by the Whittaker footing drain system.

PROJECT SCHEDULE

The following summarizes the work conducted to date and the current schedule for anticipated reporting and monitoring work at the SKS Site.

Cleanup Plan Task	Status: Date
UST Fuel Removal and Station Shutdown	Conducted: July 2013
Installation of Shoring for UST removal	Conducted: November 2013
UST System Cleaning and Removal	Conducted: December 2013
Submit UST Removal Report	Conducted: January 2014
Permitting for Wells	Conducted: May 2014
Master Use Permit	Conducted: June 2014
Install Dewatering Wells (8 Wells)	Conducted: July 2014
Install West Bounding Well MW107 (post demolition)	Conducted: October 2014
SKS Site Demolition and Hoist Removal	Conducted: October–November 2014
Construct Dewatering System in ROW Wells	Conducted: March 2015
Operate Dewatering System	Conducted: March–June 2015
Contaminated Soil Excavation and Confirmation Sampling	Conducted: March–May 2015
Removal of Three Previously Unknown USTs	Conducted: March 2015
Backfill Excavation and Install Membrane Barrier	Conducted: August–September 2015
Install Compliance Wells MW108, MW109, and MW110	Conducted: September 2015
Prepare Interim Cleanup Action Report	Conducted: December–February 2016
First Quarter Post Cleanup Groundwater Monitoring	Conducted: March 2016
Submit preliminary Cleanup Action Report	Conducted: October 2016
Notice of Intent to Decommission Wells	Conducted: May 2017
Groundwater Elevation Study	In Progress: 2017–2018
Revised Agency-Review Cleanup Action Report	Conducted: January 2018
Alaska St. well closure technical meeting	Conducted: May 2018

Well Installation of MW113
Well Installation of MW111 and MW112
Well Decommissioning (RW06—RW09, MW107)
Contingent ChemOx Injection*
Groundwater Monitoring (Quarterly)

Conducted: March 2018
Planned: August-September 2018
Planned: September 2018
Pending: 2019
Planned: 2018–2021

NOTES:

* = to be determined
ChemOx = Chemical Oxidant
ROW = right-of-way
SKS Site = SKS Shell Station Site
UST = underground storage tank

CLOSING

Please let me know if you would like to meet on-site or at your office to discuss any of the specific remedial activities. If you have any questions about the schedule and the cleanup activities, please contact me at 206-306-1900.

Respectfully,

SoundEarth Strategies, Inc.

Rob Roberts
Senior Scientist



Terry Montoya, PE
Principal Engineer

Attachment: Groundwater Monitoring Report—Second Quarter 2018

cc: Mr. Brad Reisinger, Lennar Multifamily
Mr. Ian Fishburn, Lennar Multifamily
Mr. Ken Lederman, Foster Pepper PLLC
Mr. Phil Carmody, GID
Mr. Jason Sweatt, GID
Mr. Ian Sutton, Joyce Ziker Parkinson, PLLC
Mr. Dave Cook, Aspect Consulting

CER:rt

GROUNDWATER MONITORING REPORT—SECOND QUARTER 2018



SoundEarth Strategies, Inc.
2811 Fairview Avenue East, Suite 2000
Seattle, Washington 98102

August 10, 2018

Mr. Ian Fishburn
LMI West Seattle Holdings, LLC
1325 Fourth Avenue, Suite 1700
Seattle, Washington 98101-2528

SUBJECT: GROUNDWATER MONITORING REPORT—SECOND QUARTER 2018
SKS Shell Station Site
3901 Southwest Alaska Street
Seattle, Washington
Project Number: 0914-001

Dear Mr. Fishburn:

SoundEarth Strategies, Inc. (SoundEarth) has prepared this report to present the results of the Second Quarter 2018 groundwater monitoring event conducted at the SKS Shell Station Site located at 3901 Southwest Alaska Street in Seattle, Washington (SKS Site), as shown on Figure 1. The groundwater monitoring event was conducted to evaluate the long-term effectiveness of the cleanup activities completed on and beneath the SKS Site that are being performed pursuant to the Cleanup Action Plan under Prospective Purchase Consent Decree #13-2-27556-2, entered on July 29, 2013.

BACKGROUND

The SKS Site was developed as a gasoline station and an automotive repair facility in 1934. In 1950, the original 1934 gasoline fueling equipment was removed and two 4,000-gallon underground storage tanks (USTs) were installed. The pump island and service station office were removed in 1961 and replaced with a new pump island, relocated to locations as shown on Figure 2. An additional 8,000-gallon UST was installed in 1974. The 1950-vintage USTs were removed in 1984 and replaced with one 10,000-gallon UST and two 12,000-gallon USTs. Over time, leaded and unleaded gasoline and diesel fuel have been used and stored in various USTs at the SKS Site. In December 2013, the three 1984-vintage USTs and the 1974-vintage UST were decommissioned and removed from the SKS Site.

SoundEarth conducted remedial activities on the SKS Site in 2015 as part of the Whittaker multi-family/mixed use development. Remedial activities included lot-line to lot-line remedial excavation of petroleum-contaminated soil to approximately 29.5 feet below ground surface (240 feet North American Vertical Datum 1988 [NAVD88]), right-of-way (ROW) dewatering to facilitate removal of contaminated water, and vapor barrier installation. Approximately 9,755 tons of petroleum-contaminated soil were removed from the SKS Site.

On September 1, 2015, monitoring wells MW108 through MW110 were installed in the basement/parking garage level of the building now located on the SKS Site to complete compliance groundwater monitoring.

On March 16, 2018, monitoring well MW113 was installed west of the SKS Site at the former Howden-Kennedy Funeral Home parcel (Kennedy Property) in the basement/parking garage level of the building (Figure 2). This well was installed to assess the lateral extent of groundwater impacts to the southwest of the SKS Site and to confirm that no residual groundwater contamination remains on the Kennedy Property. This well was also installed to provide groundwater elevation information for the evaluation of the reversal in groundwater flow direction at the SKS Site.

FIELD ACTIVITIES

The Second Quarter monitoring event was conducted on June 21 and 22, 2018, to evaluate the long-term effectiveness of cleanup activities. Groundwater sampling was conducted on a total of 11 on-property and off-property compliance wells. The monitoring event included measuring depths to groundwater and sampling monitoring wells MW108 through MW110 and MW113 located in the building parking garage, and wells MW101, MW102, MW104, MW105 and RW03 through RW05, located within the Fautleroy Way Southwest ROW. Consistent with the First Quarter 2018 monitoring event, remediation wells RW01 and RW02 were not included in this monitoring event, based on a telephone discussion between Dale Myers of the Washington State Department of Ecology (Ecology) and Rob Roberts of SoundEarth prior to the Third Quarter 2017 groundwater sampling event. Well MW103, located within the Fautleroy Way Southwest ROW, was measured for depth to groundwater but was not analyzed during Second Quarter 2018 due to insufficient water column in the well at the time of sampling (0.43 feet).

Upon arrival at the SKS Site, SoundEarth personnel opened monitoring wells and permitted water levels to equilibrate with atmospheric pressure for a minimum of 30 minutes before groundwater level measurements were obtained. Groundwater levels were measured relative to the top of well casing to an accuracy of 0.01 feet using an electronic water level meter.

Groundwater samples were collected from monitoring wells MW101, MW102, MW104, MW105, MW108 through MW110, MW113, and remediation wells RW03 through RW05, in accordance with the U.S. Environmental Protection Agency (EPA) *Low-Flow (Minimal Drawdown) Ground-Water Procedures* (April 1996). Purging and sampling of each monitoring well were performed using a peristaltic pump and dedicated polyethylene tubing at flow rates ranging from 100 to 190 milliliters per minute. The intake was placed approximately 2 to 3 feet below the surface of the groundwater or mid-screen, if well screen is submerged, in each monitoring well. During purging, water quality was monitored using a YSI water quality meter equipped with a flow-through cell. The water quality parameters that were monitored and recorded included temperature, pH, specific conductance, dissolved oxygen, turbidity, and oxidation-reduction potential. Each monitoring well was purged until a minimum subset of pH, specific conductivity, and dissolved oxygen and/or turbidity stabilized. Monitoring wells MW104 and MW108 were purged dry while filling the flow-through cell. Therefore, grab samples were collected from these wells once the wells had recharged to their initial groundwater level. The low recharge rates observed during purging at wells MW104 and MW108 are similar to conditions observed during previous events.

Following purging, groundwater samples were collected from the pump outlet tubing located upstream of the flow-through cell and placed directly into clean, laboratory-prepared sample containers. Each container was labeled with a unique sample identification number, placed on ice in a cooler, and transported to Friedman & Bruya, Inc., of Seattle, Washington, under standard chain-of-custody protocols for laboratory analysis.

The groundwater samples were submitted for analysis of gasoline-range petroleum hydrocarbons (GRPH) by Northwest Total Petroleum Hydrocarbon (NWTPH) Method NWTPH-Gx; benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8021B; and diesel- and oil-range petroleum hydrocarbons (DRPH and ORPH, respectively) by Method NWTPH-Dx.

Purge water generated during the monitoring event was placed in an appropriately labeled 55-gallon steel drum and temporarily stored on the SKS Site pending receipt of analytical data and proper disposal.

RESULTS

Groundwater Elevations and Flow Direction

Groundwater levels measured on June 21, 2018, ranged in elevation from approximately 242.20 (MW101 in the Fautleroy Way Southwest ROW) to 240.05 (MW109 in the building parking garage) feet NAVD88 (Table 1). Historical groundwater measurements have indicated that groundwater at the Fautleroy Way Southwest and Southwest Alaska Street intersection consistently flowed at a moderate gradient of 0.015 feet per foot to the north–northeast. However, recent groundwater elevation data collected in 2017 and 2018 indicate a groundwater flow direction to the west at a gradient of approximately 0.014 feet per foot along the Fautleroy Way Southwest property edge. Figure 2 provides a rose diagram showing the groundwater flow directions and gradients prior to the remedial excavation and the most recent four quarters of groundwater monitoring. This second quarter groundwater monitoring event is consistent with the flow direction data obtained since Second Quarter 2017. The observed change in groundwater flow is likely due to the footing drains and associated sub-slab drainage system installed between July and September 2015 for the underground parking garage, as discussed in the Conclusions section.

Groundwater Chemical Analytical Results

Groundwater analytical results from the monitoring event are summarized below (Figure 3; Table 1). The analytical results for groundwater samples collected from MW108 through MW110 (located on-Property), MW113 (located west of the Property on the Kennedy Property), as well as MW101, MW102, MW105, RW04, and RW05 (all located within the Fautleroy Way Southwest ROW), were below Washington State Model Toxics Control Act (MTCA) A cleanup levels (CULs) for the chemicals of concern at the SKS Site. Concentrations of GRPH, ORPH, BTEX were below the MTCA Method A CULs for groundwater samples collected from all sampled wells. Data from the Second Quarter 2018 sampling event are tabulated in Table A below.

Table A – Second Quarter 2018 Groundwater Analytical Results

Well ID	Sample Date	Analytical Results (micrograms per liter)		
		GRPH	Benzene	DRPH
MW101	06/21/18	<100	<1	<50
MW102	06/22/18	<100	<1	<50
MW103	06/21/18	Insufficient water to analyze		
MW104	06/21/18	130	<1	720
MW105	06/21/18	<100	<1	<50
MW108	06/21/18	<100	<1	150 ^x
MW109	06/21/18	190	<1	200
MW110	06/21/18	<100	<1	96 ^x
MW113	06/21/18	<100	<1	71 ^x
RW03	06/22/18	730	<1	740^x
RW04	06/21/18	360	<1	400 ^x
RW05	06/21/18	140	<1	180 ^x
MTCA Method A Cleanup Level		1,000/800	5	500

NOTES:

Red denotes concentration exceeds the MTCA cleanup level.

< = not detected above the laboratory reporting limit

DRPH = diesel-range petroleum hydrocarbons

GRPH = gasoline-range petroleum hydrocarbons

MTCA = Washington State Model Toxics Control Act

Laboratory Note:

^xThe sample chromatographic pattern does not resemble the fuel standard used for quantitation.

A detailed summary of the analytical results for the primary chemicals of concern for the SKS Site, including GRPH, benzene, and DRPH, is provided below:

- **Gasoline-Range Petroleum Hydrocarbons.** The groundwater samples collected from the monitoring wells (MW101, MW102, MW104, MW105, and MW108 through MW110 as identified in the 2013 Draft Cleanup Action Plan), as well as newly installed monitoring well MW113, were below the MTCA Method A CUL of 800 micrograms per liter (µg/L) for GRPH. GRPH concentrations were also below the MTCA Method A CUL in groundwater samples collected from wells RW03 through RW05. GRPH concentrations detected in wells MW104, MW109, RW03, RW04, and RW05 during the Second Quarter 2018 sampling event were generally lower than or similar with the concentrations detected in these wells during the First Quarter 2018 groundwater sampling event.
- **Benzene.** All groundwater samples collected from the well network during the Second Quarter 2018 event were below the laboratory reporting limit for benzene. Groundwater sample analytical results for wells RW03 and RW04 were lower than the previous concentrations of benzene detected in these wells (3.0 and 1.5 µg/L, respectively) during First Quarter 2018.
- **Diesel-Range Petroleum Hydrocarbons.** DRPH concentrations were below the MTCA Method A CUL in groundwater samples collected from the well network with the exception of wells MW104 and RW03 during Second Quarter 2018. The groundwater sample collected from MW104 had a detectable concentration of DRPH of 720 µg/L, exceeding the MTCA Method A CUL of 500 µg/L. The concentration of DRPH in groundwater at well MW104 was 3,000 µg/L during the Second

Quarter 2017. The concentration of DRPH in groundwater at well MW104 from the Second Quarter 2017 to the Second Quarter 2018 has reduced by approximately 76 percent. In addition, the groundwater sample collected in the Second Quarter 2018 from well RW03 had a detectable concentration of DRPH of 740 µg/L, exceeding the MTCA Method A CUL. The concentration of DRPH in groundwater at well RW03 was 1,500 µg/L in the Second Quarter 2017.

As shown in the attached Charts 1 through 4, which summarize trends in GRPH and benzene concentrations in monitoring wells MW104, MW108, MW109, and MW110 since 2011, GRPH and benzene in all four monitoring wells during Second Quarter 2018 are significantly lower than concentrations observed pre-remediation excavation. GRPH and benzene concentrations in these four monitoring wells have decreased or remained below laboratory reporting limits or the MTCA Method A CULs since First Quarter 2017, with the exception of a slight increase in GRPH concentrations in MW109 during Fourth Quarter 2017 and First Quarter 2018. Figure 4 includes trend charts as well as data comparison tables from six ROW monitoring wells. The tables on Figure 4 illustrate that ROW groundwater concentrations were either non-detect for GRPH and benzene before and after the 2015 excavation (MW101 through MW103 and MW105), or that concentrations are significantly reduced (RW02 and RW04).

Copies of the laboratory analytical reports are provided as Attachment A.

DATA VALIDATION

SoundEarth contracted with Validata, LLC to conduct a Stage 2A-level quality assurance/quality control (QA/QC) review of the analytical results. The data were reviewed using the guidance and quality control criteria documented in the EPA's National Functional Guidelines for Organic Data Review (1999 and 2008). The quality control requirements that were reviewed included sample receipt, handling, and holding times; recoveries for method blanks, surrogates, spikes, and field duplicates; and reporting limits.

Results. The DRPH results for groundwater samples collected from wells RW03, RW04, RW05, MW108, MW110, and MW113 were qualified as estimated (J+) since the laboratory reported the diesel range results as "x", indicating that the chromatographic pattern does not match the standard. All other QA/QC criteria were confirmed to be acceptable for the groundwater samples, and the analytical results are considered to be acceptable for use. A copy of the Validata, LLC Data Validation Report is provided as Attachment B.

Following data validation, the groundwater data were uploaded to Ecology's Environmental Information Management system.

CONCLUSIONS

Petroleum hydrocarbons (GRPH, DRPH, ORPH, and BTEX) were either not detected or detected at concentrations less than MTCA Method A CULs in 9 of the 11 wells sampled and analyzed for groundwater at the SKS Site during this monitoring event, with the exception of the following:

- Remediation well RW03 and monitoring well MW104, which had detectable concentrations of DRPH exceeding the MTCA Method A CUL.

Wells RW03 and MW104 are both located in the Fauntleroy Way southwest sidewalk (Figures 3 and 4; Table 1; Charts 1 through 4).

Although concentrations of DRPH remain in exceedance of CULs at wells MW104 and RW03, analytical data trends indicate that concentrations of DRPH have decreased significantly in the ROW wells, including wells RW03 and MW104, between June 2017 and June 2018. It is recommended that groundwater monitoring continue to further assess the natural attenuation of petroleum hydrocarbons at these well locations and to confirm the degradation trends. At this time, the analytical groundwater data and monitoring trends indicate that no additional treatment is warranted.

The historical groundwater flow direction was documented to be north–northeast prior to development, but based on the most recent groundwater elevations, the flow direction has changed to the west–southwest (see Rose Diagrams in Figure 2). As shown on Figures 5 and 6, the building is equipped with a sub-slab drainage system that should (based on location) intercept groundwater at the south and west boundaries of the new sub-grade parking levels. The two-level parking garage includes a grid-work of sub-slab drains and vertical wall footing drains that lead to a 300-foot-long, 6-foot-internal-diameter stormwater retention pipe located beneath the eastern side of the building (Figure 5). The southwestern portion of the parking garage was constructed approximately 28 feet below grade surface, and the current building footing drain system appears to be intercepting that groundwater beneath the SKS Site and the entire Whittaker property. We are currently analyzing whether the building drainage system is affecting the groundwater elevation and flow direction at the northeast corner of the Whittaker property.

During March 2018, monitoring well MW113 was installed in the parking garage beneath the building on the Kennedy Property to the west of the SKS Site. GRPH, DRPH, ORPH, and BTEX were all below the applicable MTCA Method A cleanup levels in this well during First and Second Quarters 2018, indicating that the change in groundwater flow direction has not impacted groundwater to the west of the SKS Site.

SCHEDULE

SoundEarth will conduct a monitoring event of the well network at the SKS Site in Third Quarter 2018, and the results will be included in a groundwater monitoring report. The proposed monitoring wells MW111 and MW112 (Figure 2) will be scheduled for installation upon authorization with the City of Seattle through the permit process. In addition, the newly installed monitoring wells will be professionally surveyed to confirm the estimated elevations for these wells.

CLOSING

SoundEarth appreciates this opportunity to provide LMI West Seattle Holdings, LLC, with environmental consulting services. Please call Rob Roberts at 206-306-1900 if you have any questions or comments regarding the content of this report.

Respectfully,
SoundEarth Strategies, Inc.



Clare Tochilin, LG
Project Geologist



Rob Roberts
Senior Scientist

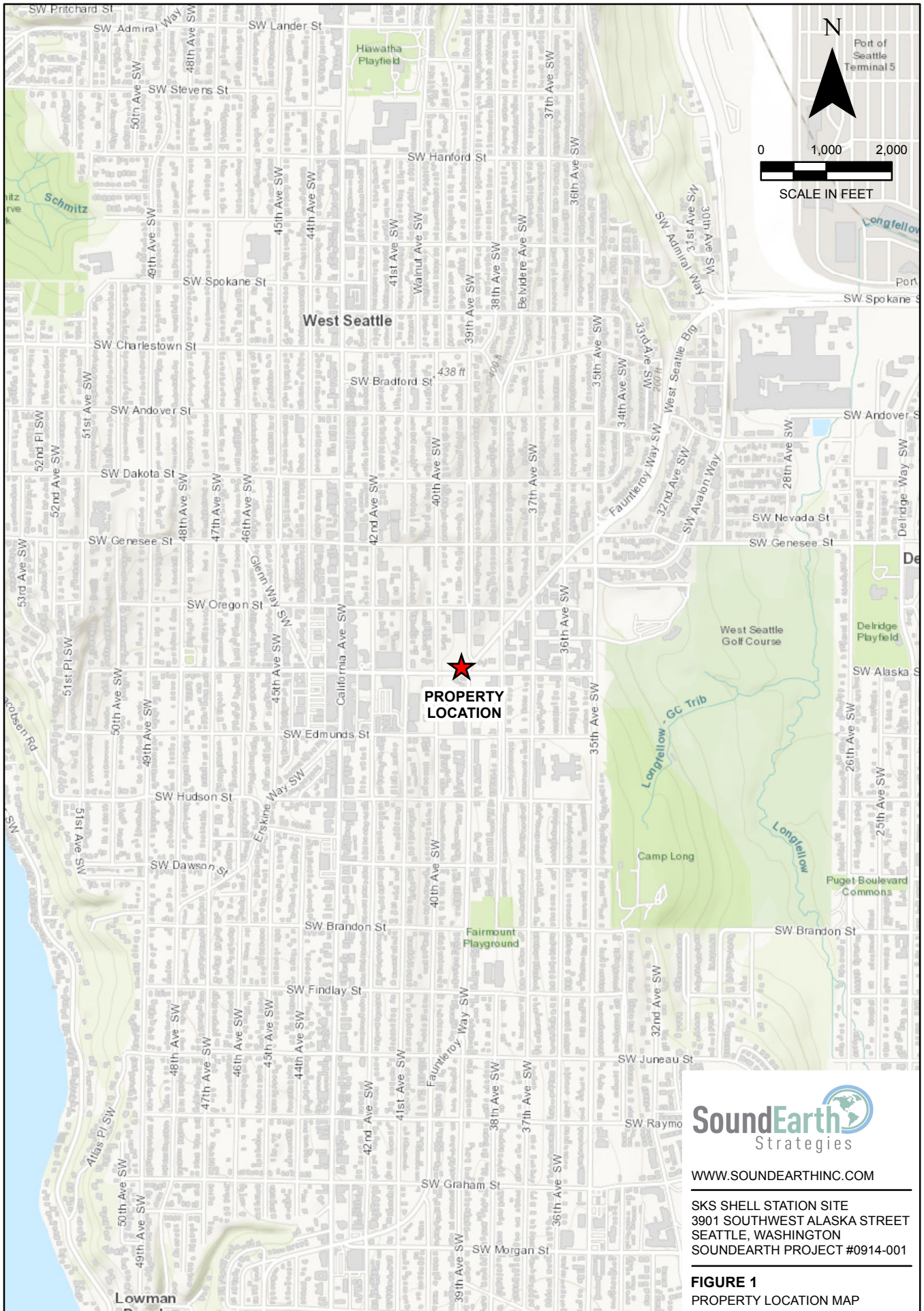


Terry Montoya, PE
Principal Engineer

Attachments: Figure 1, Property Location Map
Figure 2, Groundwater Elevation Contour Map (June 21 and 22, 2018)
Figure 3, 2018 Q2 Groundwater Analytical Data
Figure 4, GRPH and Benzene Concentration Trends in Groundwater
Figure 5, Sub-Slab Drainage Plan with Cross Section Location
Figure 6, Cross Section A-A'
Table 1, Summary of Groundwater Data
Chart 1, GRPH and Benzene Concentrations—MW104
Chart 2, GRPH and Benzene Concentrations—GLMW01/MW109
Chart 3, GRPH and Benzene Concentrations—MW110/MW-2
Chart 4, GRPH and Benzene Concentrations—MW-3/MW108
A, Laboratory Analytical Report
Friedman & Bruya, Inc. #806428
B, Data Validation Report
Validata, LLC #806428

CJT/CER:rt

FIGURES



PROPERTY LOCATION

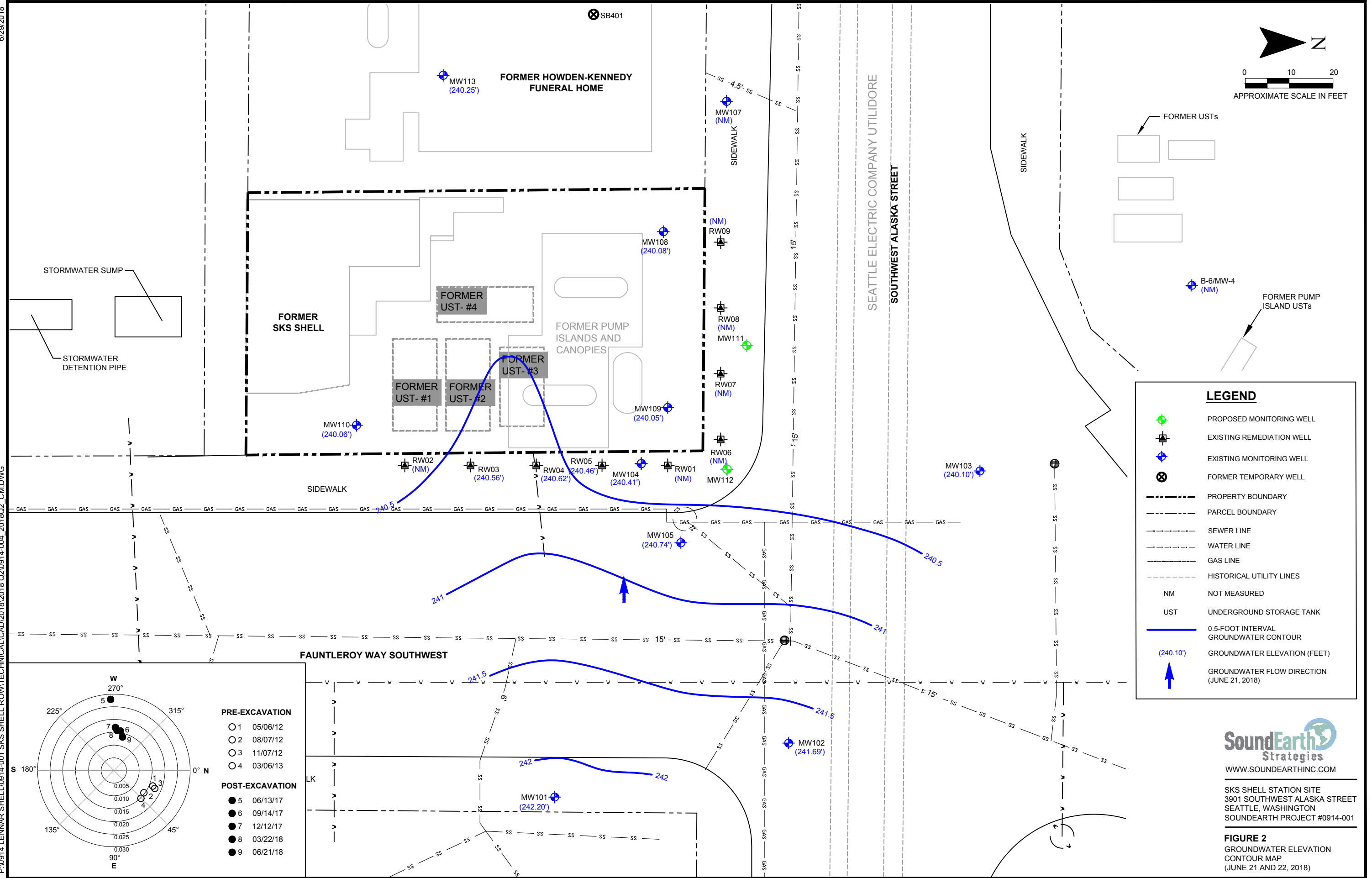
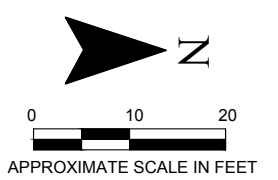


WWW.SOUNDEARTHINC.COM

SKS SHELL STATION SITE
3901 SOUTHWEST ALASKA STREET
SEATTLE, WASHINGTON
SOUNDEARTH PROJECT #0914-001

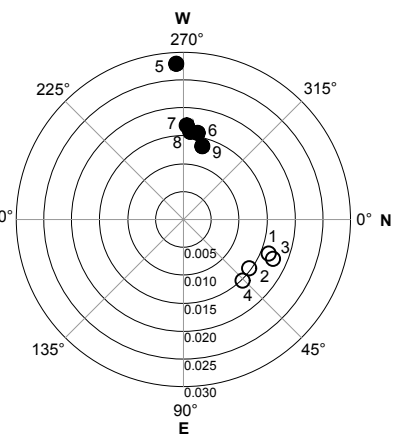
FIGURE 1
PROPERTY LOCATION MAP

6/29/2018
P:\0914 LENNAR SHELLO\0914-001 SKS SHELL ROW\TECHNICAL\CAD\2018\02\0914-004_2018Q2_CM.DWG



LEGEND

- PROPOSED MONITORING WELL
- EXISTING REMEDIATION WELL
- EXISTING MONITORING WELL
- FORMER TEMPORARY WELL
- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- SEWER LINE
- WATER LINE
- GAS LINE
- HISTORICAL UTILITY LINES
- NM NOT MEASURED
- UST UNDERGROUND STORAGE TANK
- 0.5-FOOT INTERVAL GROUNDWATER CONTOUR
- GROUNDWATER ELEVATION (FEET)
- GROUNDWATER FLOW DIRECTION (JUNE 21, 2018)



- PRE-EXCAVATION**
- 1 05/06/12
 - 2 08/07/12
 - 3 11/07/12
 - 4 03/06/13
- POST-EXCAVATION**
- 5 06/13/17
 - 6 09/14/17
 - 7 12/12/17
 - 8 03/22/18
 - 9 06/21/18

SoundEarth Strategies
WWW.SOUNDEARTHINC.COM

SKS SHELL STATION SITE
3901 SOUTHWEST ALASKA STREET
SEATTLE, WASHINGTON
SOUNDEARTH PROJECT #0914-001

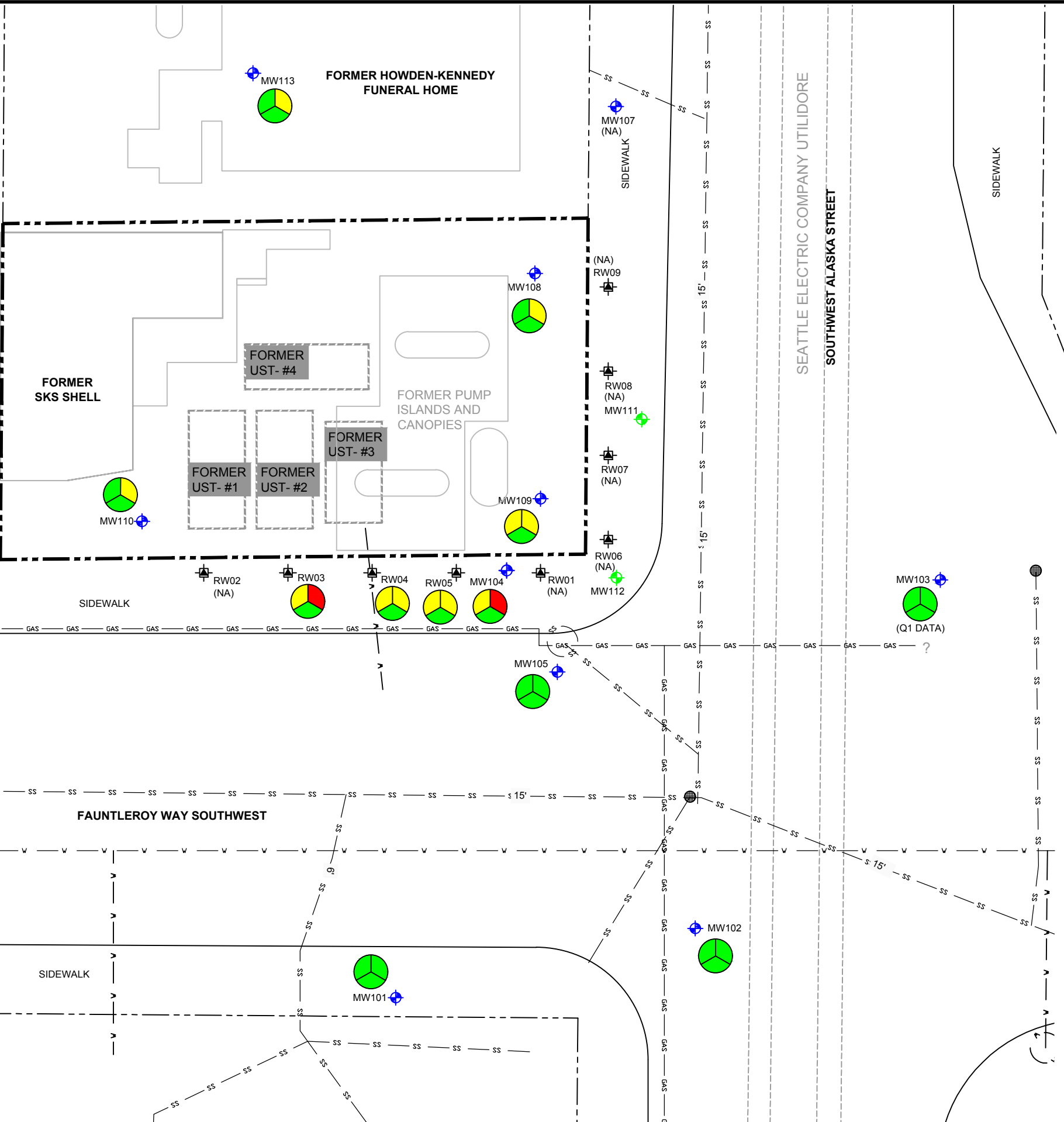
FIGURE 2
GROUNDWATER ELEVATION CONTOUR MAP
(JUNE 21 AND 22, 2018)

7/10/2018
P:\0914 LENNAR S-SHELL\0914-001 SKS SHELL ROW\TECHNICAL\CAD\2018\2018 Q2\0914-004_2018Q2_GD.DWG

KEY

◆ DENOTES CONCENTRATION EXCEEDS MTCA METHOD A CLEANUP LEVEL
◆ DENOTES CONCENTRATION BELOW LABORATORY REPORTING LIMIT
◆ DENOTES CONCENTRATION DETECTED ABOVE LABORATORY REPORTING LIMIT BUT BELOW MTCA METHOD A CLEANUP LEVEL
 NOT ANALYZED

Well ID	Sample Date	Analytical Results (micrograms per liter)			
		GRPH	Benzene	DRPH	ORPH
MW101	09/13/17	<100	<1	<60	<300
	12/12/17	<100	<1	<50	<250
	03/22/18	<100	<1	<60	<300
	06/21/18	<100	<1	<50	<250
MW102	09/13/17	<100	<1	<50	<250
	12/12/17	<100	<1	<50	<250
	03/22/18	<100	<1	<65	<320
	06/22/18	<100	<1	<50	<250
MW103	09/13/17	<100	<1	140	<375
	12/12/17	<100	<1	120	<250
	03/22/18	<100	<1	<80	<400
	06/21/18	Insufficient water column to sample			
MW104	09/14/17	460	<1	2,200	<300
	12/12/17	340	<1	780	<350
	03/22/18	220	<1	590	<250
	06/21/18	130	<1	720	<350
MW105	09/13/17	<100	<1	<60	<300
	12/12/17	<100	<1	<50	<250
	03/22/18	<100	<1	<65	<320
	06/21/18	<100	<1	<50	<250
MW108	09/14/17	<100	<1	160	<250
	12/12/17	<100	<1	<50	<250
	03/23/18	<100	<1	71	<250
	06/21/18	<100	<1	150	<450
MW109	09/14/17	<100	<1	140	<300
	12/12/17	150	<1	<50	<250
	03/23/18	190	<1	110	<250
	06/21/18	190	<1	200	<250
MW110	12/12/17	<100	<1	99	<250
	03/23/18	<100	<1	73	<250
	03/23/18	<100	<1	73	<250
	06/21/18	<100	<1	96	<250
MW113	03/23/18	<100	<1	93	<250
	06/21/18	<100	<1	71	<250
RW02	06/14/17	<100	<1	<50	<250
	09/14/17	560	2.8	690	<300
RW03	12/12/17	2,500	8.8	1,000	<300
	03/22/18	2,100	3.0	760	<250
	06/22/18	730	<1	740	<250
	09/14/17	400	6.4	330	<250
RW04	12/12/17	360	3.0	200	<300
	03/22/18	450	1.5	500	<250
	06/21/18	360	<1	400	<250
	09/14/17	280	<1	300	<300
RW05	12/12/17	230	<1	170	<300
	03/22/18	180	<1	140	<260
	06/21/18	140	<1	180	<250
	MTCA Method A Cleanup Level	1,000/800	5	500	500



LEGEND

- ◆ PROPOSED MONITORING WELL
- EXISTING REMEDIATION WELL
- ◆ EXISTING MONITORING WELL
- FORMER TEMPORARY WELL
- PROPERTY BOUNDARY
- - - - - PARCEL BOUNDARY
- SS SS SEWER LINE
- V V WATER LINE
- GAS GAS GAS LINE
- HISTORICAL UTILITY LINES
- GRPH GASOLINE-RANGE PETROLEUM HYDROCARBONS
- DRPH DIESEL-RANGE PETROLEUM HYDROCARBONS
- ORPH OIL-RANGE PETROLEUM HYDROCARBONS
- MTCA WASHINGTON STATE MODEL TOXICS CONTROL ACT
- UST UNDERGROUND STORAGE TANK
-
 DENOTES CONCENTRATION EXCEEDS MTCA METHOD A CLEANUP LEVEL
- <
 RESULT BELOW LABORATORY REPORTING LIMITS
- NA
 NOT ANALYZED

SoundEarth Strategies
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SEATTLE, WASHINGTON
SOUNDEARTH PROJECT #0914-001

FIGURE 3
2018 Q2 GROUNDWATER ANALYTICAL DATA

CHART 1: MW104 – GRPH AND BENZENE

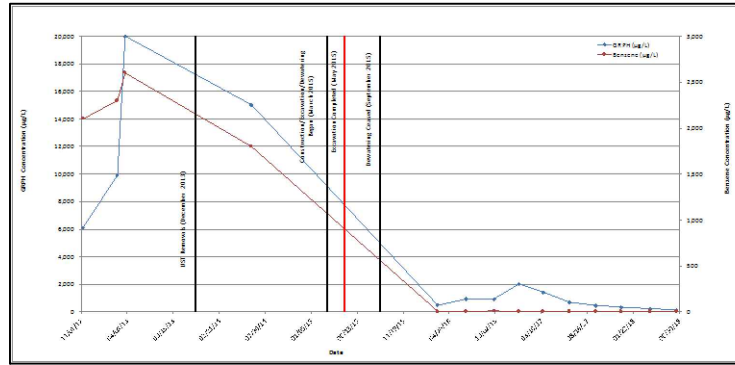


CHART 2: GLMW01 / MW109 – GRPH AND BENZENE

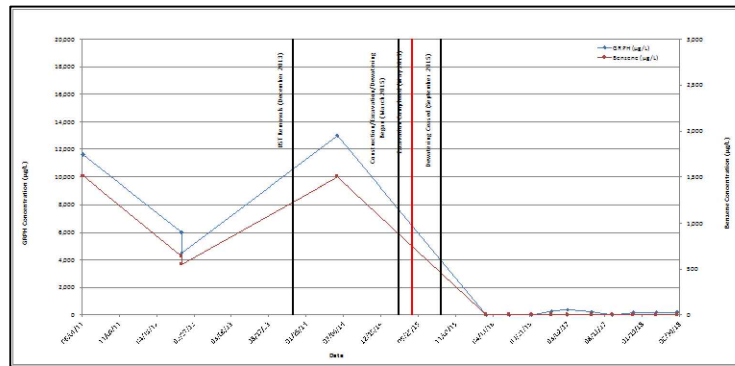


CHART 3: MW-2 / MW110 – GRPH AND BENZENE

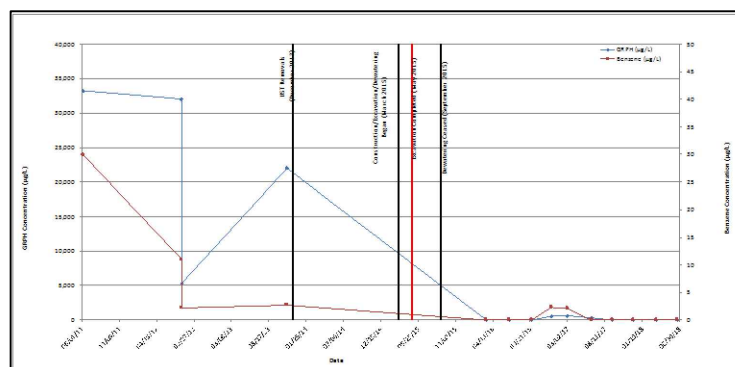
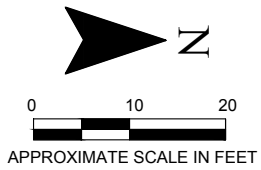
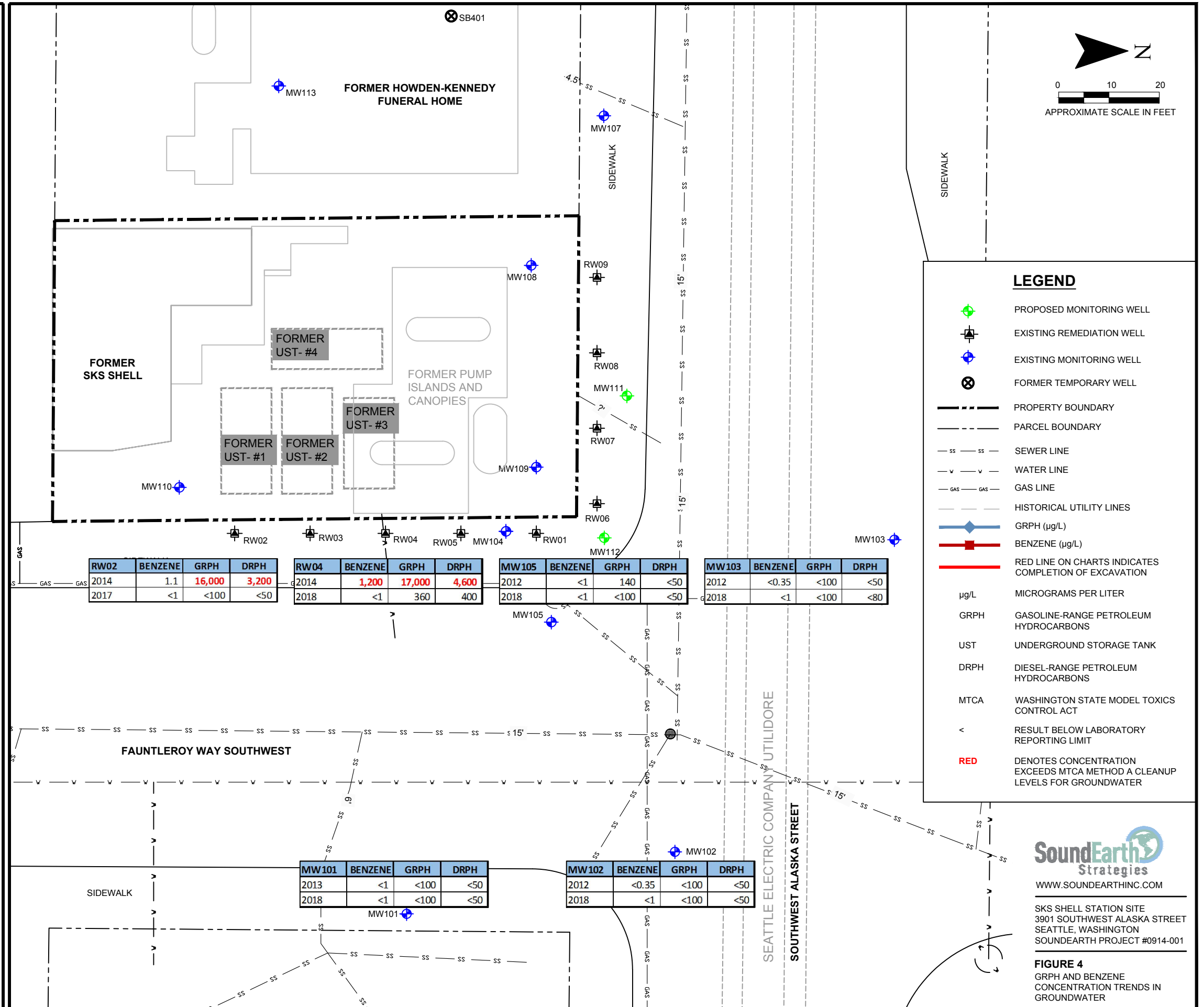
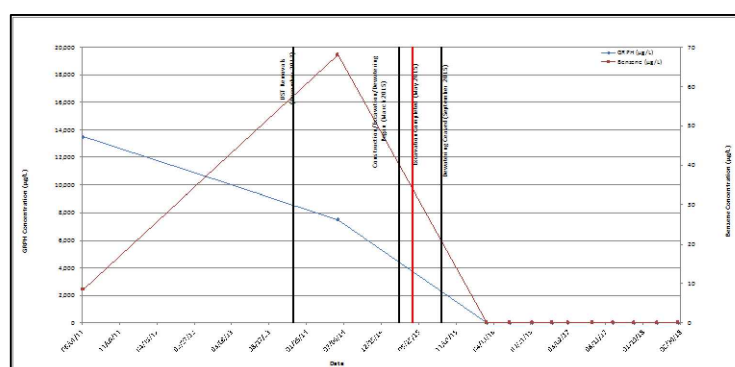


CHART 4: MW-3 / MW108 – GRPH AND BENZENE



LEGEND

- PROPOSED MONITORING WELL
- EXISTING REMEDIATION WELL
- EXISTING MONITORING WELL
- FORMER TEMPORARY WELL
- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- SEWER LINE
- WATER LINE
- GAS LINE
- HISTORICAL UTILITY LINES
- GRPH (µg/L)
- BENZENE (µg/L)
- RED LINE ON CHARTS INDICATES COMPLETION OF EXCAVATION
- MICROGRAMS PER LITER
- GASOLINE-RANGE PETROLEUM HYDROCARBONS
- UNDERGROUND STORAGE TANK
- DIESEL-RANGE PETROLEUM HYDROCARBONS
- WASHINGTON STATE MODEL TOXICS CONTROL ACT
- RESULT BELOW LABORATORY REPORTING LIMIT
- DENOTES CONCENTRATION EXCEEDS MTCA METHOD A CLEANUP LEVELS FOR GROUNDWATER

RW02	BENZENE	GRPH	DRPH
2014	1.1	16,000	3,200
2017	<1	<100	<50

RW04	BENZENE	GRPH	DRPH
2014	1,200	17,000	4,600
2018	<1	360	400

MW105	BENZENE	GRPH	DRPH
2012	<1	140	<50
2018	<1	<100	<50

MW103	BENZENE	GRPH	DRPH
2012	<0.35	<100	<50
2018	<1	<100	<80

MW101	BENZENE	GRPH	DRPH
2013	<1	<100	<50
2018	<1	<100	<50

MW102	BENZENE	GRPH	DRPH
2012	<0.35	<100	<50
2018	<1	<100	<50



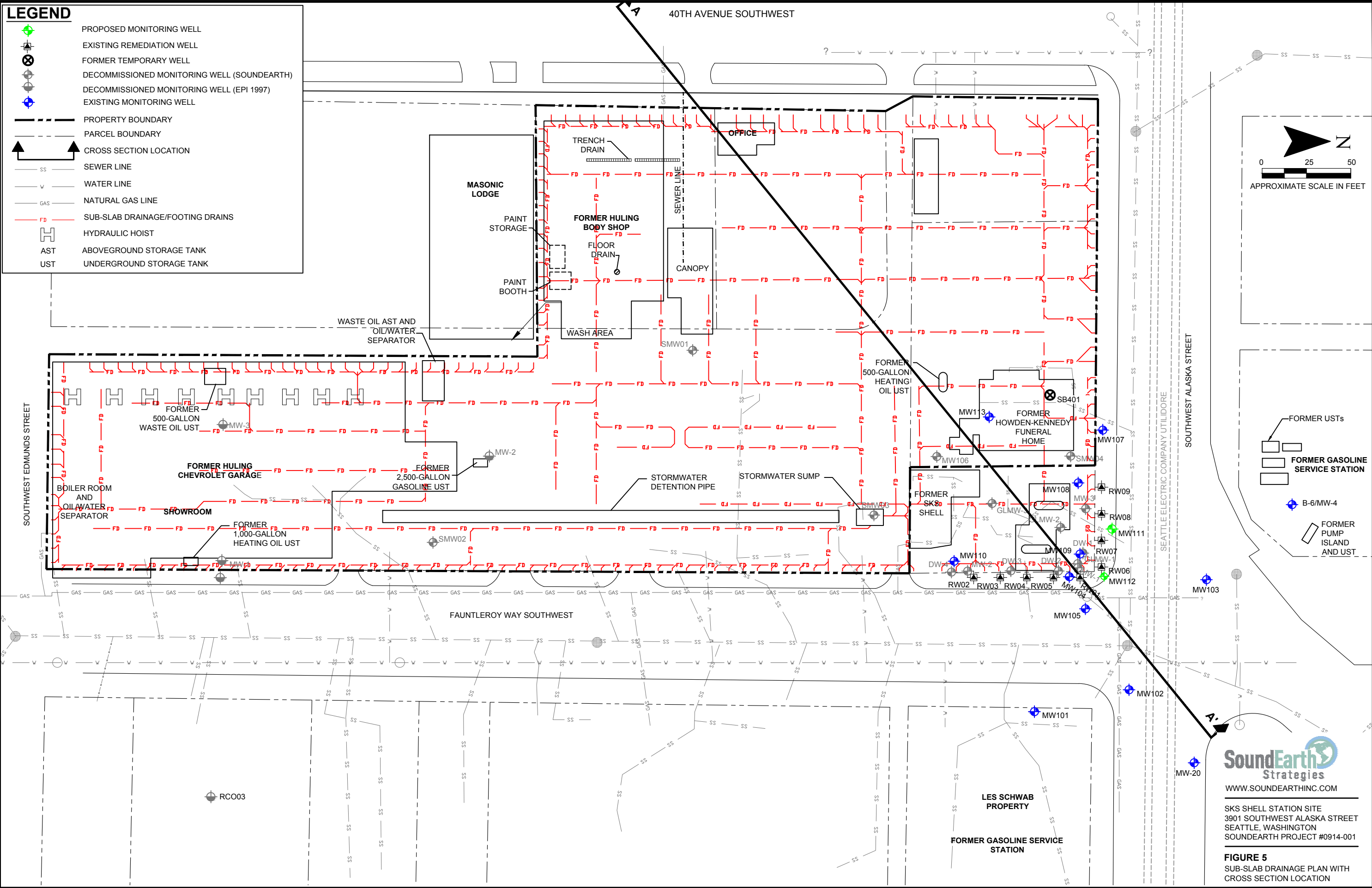
SKS SHELL STATION SITE
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SEATTLE, WASHINGTON
SOUNDEARTH PROJECT #0914-001

FIGURE 4
GRPH AND BENZENE
CONCENTRATION TRENDS IN
GROUNDWATER

6/29/2018
P:\0914 LENNAR SHELLO\0914-001 SKS SHELL ROW\TECHNICAL\CAD\2018\201802_004_2018Q2_EL.DWG

LEGEND

- PROPOSED MONITORING WELL
- EXISTING REMEDIATION WELL
- FORMER TEMPORARY WELL
- DECOMMISSIONED MONITORING WELL (SOUNDEARTH)
- DECOMMISSIONED MONITORING WELL (EPI 1997)
- EXISTING MONITORING WELL
- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- CROSS SECTION LOCATION
- SEWER LINE
- WATER LINE
- NATURAL GAS LINE
- SUB-SLAB DRAINAGE/FOOTING DRAINS
- HYDRAULIC HOIST
- ABOVEGROUND STORAGE TANK
- UNDERGROUND STORAGE TANK

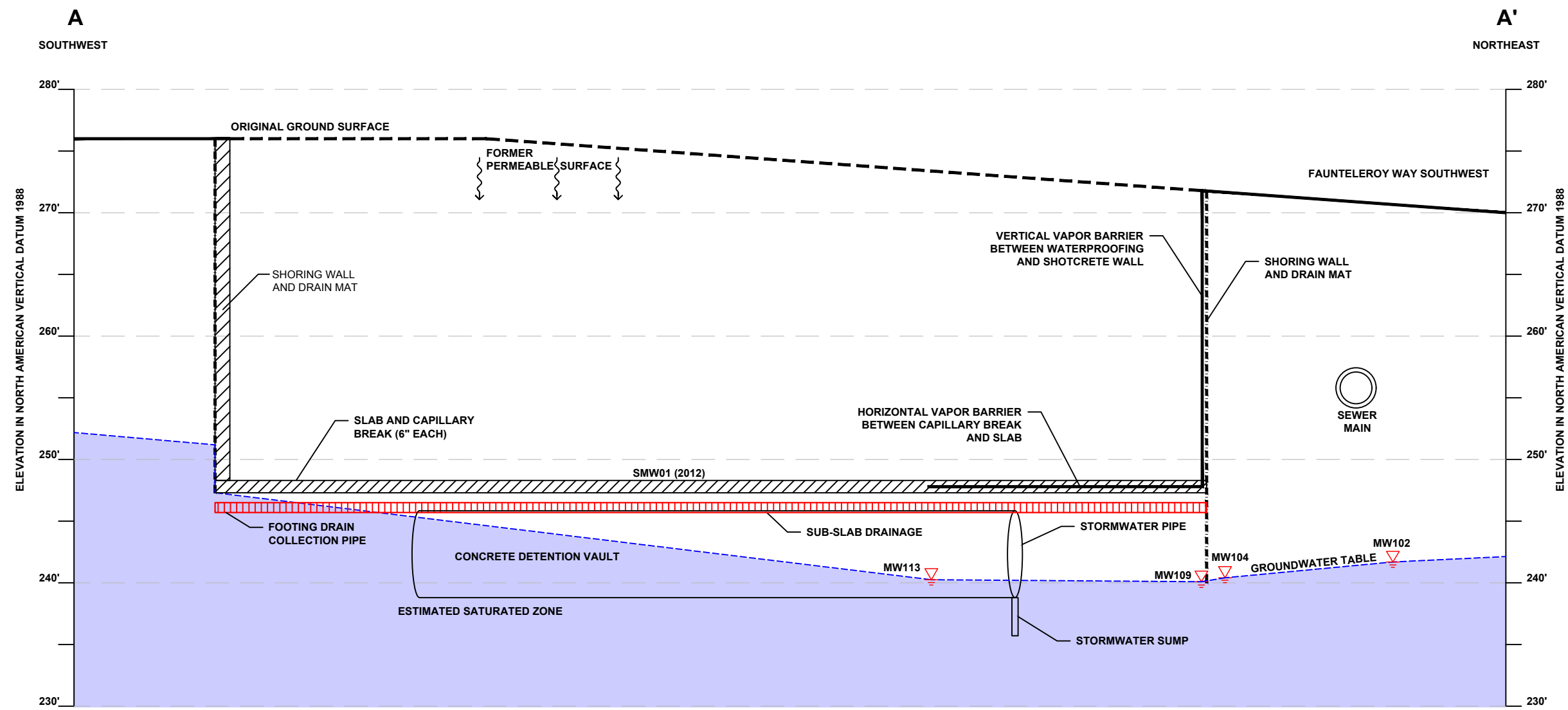


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SEATTLE, WASHINGTON
SOUNDEARTH PROJECT #0914-001

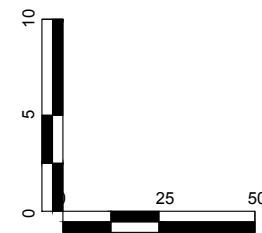
FIGURE 5
SUB-SLAB DRAINAGE PLAN WITH
CROSS SECTION LOCATION

P:\0914 LENNAR SHELL\0914-001_SKS SHELL_ROW\TECHNICAL\CAD\2018\2018 02\0914-004_2018Q2_XAA.DWG 6/29/2018



LEGEND

▽ GROUNDWATER ELEVATION 06/21/18



APPROXIMATE SCALE IN FEET



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SKS SHELL STATION SITE
3901 SOUTHWEST ALASKA STREET
SEATTLE, WASHINGTON
SOUNDEARTH PROJECT #0914-001

FIGURE 6
CROSS SECTION A-A'

TABLE



Table 1
Summary of Groundwater Data
SKS Shell Station Site
3901 Southwest Alaska Street
Seattle, Washington

Well ID	Sample Date	Top of Well Casing	Depth to Groundwater (feet below TOC)	Relative Groundwater Elevation ⁽¹⁾⁽⁷⁾	Analytical Results (µg/L)													
					GRPH ⁽²⁾	Benzene ⁽³⁾	Toluene ⁽³⁾	Ethylbenzene ⁽³⁾	Total Xylenes ⁽³⁾	MTBE ⁽³⁾	EDC ⁽³⁾	EDB ⁽³⁾	DRPH ⁽²⁾	DRPH with Silica Gel ⁽⁴⁾	ORPH ⁽²⁾	ORPH with Silica Gel ⁽⁴⁾		
MW101	08/06/12	269.54	24.39	245.15	<100	<0.35	<1	<1	<1	<3	<1	<1	<1	--	--	--	--	
	04/01/13		24.67	244.87	<100	<1	<1	<1	<1	<3	--	--	--	<50	--	<250	--	
	06/14/17		25.80	243.74	<100	<1	<1	<1	<1	<3	--	--	--	<50	--	<250	--	
	09/13/17		26.91	242.63	<100	<1	<1	<1	<1	<3	--	--	--	<60	--	<300	--	
	12/12/17		27.62	241.92	<100	<1	<1	<1	<1	<3	--	--	--	<50	--	<250	--	
	03/22/18		27.20	242.34	<100	<1	<1	<1	<1	<3	--	--	--	<60	--	<300	--	
	06/21/18		27.34	242.20	<100	<1	<1	<1	<1	<3	--	--	--	<50	--	<250	--	
MW102	11/07/12	269.06	25.41	243.65	<100	<0.35	<1	<1	<1	<3	<1	<1	<1	100	<50	<250	<250	
	06/13/17		25.42	243.64	<100	<1	<1	<1	<1	<3	--	--	--	<50	--	<250	--	
	09/13/17		26.54	242.52	<100	<1	<1	<1	<1	<3	--	--	--	<50	--	<250	--	
	12/12/17		27.15	241.91	<100	<1	<1	<1	<1	<3	--	--	--	<50	--	<250	--	
	03/22/18		26.69	242.37	<100	<1	<1	<1	<1	<3	--	--	--	<65	--	<320	--	
	06/22/18		27.37	241.69	<100	<1	<1	<1	<1	<3	--	--	--	<50	--	<250	--	
	06/21/18		29.45	240.10	Insufficient water column to sample													
MW103	11/07/12	269.55	27.80	241.75	<100	<0.35	<1	<1	<1	<3	<1	<1	<1	130	<50	<250	<250	
	06/13/17		28.56	240.99	<100	<1	<1	<1	<1	<3	--	--	--	<60	--	<300	--	
	09/13/17		29.12	240.43	<100	<1	<1	<1	<1	<3	--	--	--	140 ^x	--	<375	--	
	12/12/17		29.29	240.26	<100	<1	<1	<1	<1	<3	--	--	--	120	--	<250	--	
	03/22/18		29.14	240.41	<100	<1	<1	<1	<1	<3	--	--	--	<80	--	<400	--	
	06/21/18		29.45	240.10	Insufficient water column to sample													
	11/07/12		24.41	244.94							<1	<1	<1				<250	--
	03/06/13		23.24	246.11	6,100	2,100	10	120	418						4,000	--	<250	--
	04/01/13		23.37	245.98	9,900	2,300	110	470	870						1,900 ^x	--	<250	--
	06/12/14		23.37	245.98	20,000	2,600	140	640	1,300						--	540 ^x	--	<250
MW104	06/12/14	269.35	25.50	243.85	15,000	1,800	120	480	1,330			<0.01	14,000 ^x	--	250 ^x	--		
	03/17/16		26.41	242.94	480	1.2	1.8	2.2	5.7				1,200 ^x	--	<300	--		
	06/24/16		25.16	244.19	940	2.5	2.0	3.0	9.5				3,200	--	<250	--		
	09/28/16		25.55	243.80	940	7.2	<1	3.7	7.4				4,000 ^x	--	340 ^x	--		
	12/23/16		27.28	242.07	2,000	2.1	2.1	17	27				16,000	180 ^x	380 ^x	<250		
	03/17/17		27.55	241.80	1,400	<1	<1	8.5	10				7,900	290 ^x	<400	<400		
	06/15/17		27.92	241.45	700	<1	<1	4.0	3.1				3,000	370 ^x	<250	<250		
	09/14/17		28.21	241.16	460	<1	<1	1.3	<3				2,200	230 ^x	<300	<250		
	12/12/17		28.86	240.51	340	<1	1.1	1.3	<3				780 ^x	--	<350	--		
	03/22/18		28.88	240.49	220	<1	<1	<1	<3				590 ^x	--	<250	--		
06/21/18	28.96	240.41	130	<1	<1	<1	<3				720	--	<350	--				
MW105	12/13/12	269.30	24.25	245.05	140	<1	<1	<1	<3				820 ^x	<50	<250	<250		
	03/06/13		23.33	245.97	<100	<0.35	<1	<1	<1	<3				61 ^x	--	<250	--	
	06/13/17		27.36	241.94	<100	<1	<1	<1	<1	<3				<50	--	<250	--	
	09/13/17		27.96	241.34	<100	<1	<1	<1	<1	<3				<60	--	<300	--	
	12/12/17		28.41	240.89	<100	<1	<1	<1	<1	<3				<50	--	<250	--	
	03/22/18		28.45	240.85	<100	<1	<1	<1	<1	<3				<65	--	<320	--	
	06/21/18		28.56	240.74	<100	<1	<1	<1	<1	<3				<50	--	<250	--	
RW02	07/16/14	268.60	--	--	16,000	1.1	2.5	380	1,400				3,200 ^x	--	<250	--		
	06/14/17		27.22	241.38	<100	<1	<1	<1	<1	<3				<50	--	<250	--	
MTCA Method A Cleanup Levels for Groundwater ⁽⁵⁾					1,000/800 ⁽⁶⁾	5	1,000	700	1,000	20	5	0.01	500	500	500	500		



Table 1
 Summary of Groundwater Data
 SKS Shell Station Site
 3901 Southwest Alaska Street
 Seattle, Washington

Well ID	Sample Date	Top of Well Casing	Depth to Groundwater (feet below TOC)	Relative Groundwater Elevation ⁽¹⁾⁽⁷⁾	Analytical Results (µg/L)											
					GRPH ⁽²⁾	Benzene ⁽³⁾	Toluene ⁽³⁾	Ethylbenzene ⁽³⁾	Total Xylenes ⁽³⁾	MTBE ⁽³⁾	EDC ⁽³⁾	EDB ⁽³⁾	DRPH ⁽²⁾	DRPH with Silica Gel ⁽⁴⁾	ORPH ⁽²⁾	ORPH with Silica Gel ⁽⁴⁾
RW03	03/17/16	--	26.23	--	2,300	41	6.9	51	260	--	--	--	1,400 ^x	--	<250	--
	06/24/16		25.40	--	1,600	27	4.4	27	59	--	--	--	3,600	--	<250	--
	09/28/16		25.71	--	1,100	6.7	<1	20	45	--	--	--	2,400 ^x	--	<300	--
	12/23/16		26.77	--	9,000	470	16	380	750	--	--	--	11,000	720 ^x	<300	<300
	03/02/17		27.22	--	4,900	150	<10	220	190	--	--	--	11,000 ^x	880 ^x	<250	<250
	06/14/17	269.50	27.91	241.59	1,300	7.0	<1	32	11	--	--	--	1,500	320 ^x	<250	<250
	09/14/17		28.30	241.20	560	2.8	1.3	15	4.5	--	--	--	690 ^x	140 ^x	<300	<300
	12/12/17		28.82	240.68	2,500	8.8	17	39	170	--	--	--	1,000 ^x	--	<300	--
	03/22/18		28.85	240.65	2,100	3.0	5.2	29	140	--	--	--	760 ^x	--	<250	--
06/22/18	28.94	240.56	730	<1	2.3	31	34	--	--	--	740 ^x	--	<250	--		
RW04	07/16/14	269.22	--	--	17,000	1,200	270	360	1,700	--	--	--	4,600 ^x	--	270 ^x	--
	06/14/17		27.62	241.60	790	2.5	<1	16	<3	--	--	--	400	--	<250	--
	09/14/17		27.93	241.29	400	6.4	<1	26	21	--	--	--	330 ^x	--	<250	--
	12/12/17		28.55	240.67	360	3.0	1.1	12	5.2	--	--	--	200 ^x	--	<300	--
	03/22/18		28.57	240.65	450	1.5	<1	14	<3	--	--	--	500 ^x	--	<250	--
	06/21/18		28.60	240.62	360	<1	2.6	4.8	4.5	--	--	--	400 ^x	--	<250	--
RW05	06/14/17	269.09	27.64	241.45	400	<1	<1	4.4	<3	--	--	--	470	--	<250	--
	09/14/17		27.91	241.18	280	<1	1.2	1.5	<3	--	--	--	300 ^x	--	<300	--
	12/12/17		28.54	240.55	230	<1	1.3	1.5	<3	--	--	--	170 ^x	--	<300	--
	03/22/18		28.56	240.53	180	<1	<1	1.4	<3	--	--	--	140 ^x	--	<260	--
	06/21/18		28.63	240.46	140	<1	1.4	1.4	<3	--	--	--	180 ^x	--	<250	--
RW07	07/16/14	--	--	1,600	110	8.3	8.3	17	--	--	--	1,100 ^x	--	<250	--	
RW09	07/16/14	--	--	2,600	10	18	70	34	--	--	--	700 ^x	--	<250	--	
MW108	03/17/16	--	5.52	--	<100	<1	<1	<1	<3	--	--	--	93 ^x	--	<300	--
	06/24/16		3.33	--	<100	<1	<1	<1	<3	--	--	--	<50	--	<250	--
	09/28/16		3.85	--	<100	<1	<1	<1	<3	--	--	--	<60	--	<300	--
	12/23/16		6.56	--	<100	<1	<1	<1	<3	--	--	--	94 ^x	<70	<350	<350
	03/03/17		6.64	--	<100	<1	<1	<1	<3	--	--	--	<80	<80	<400	<400
	06/14/17	7.06	240.77	<100	<1	<1	<1	<3	--	--	--	140 ^x	--	<250	--	
	09/14/17	6.69	241.14	<100	<1	<1	<1	<3	--	--	--	160 ^x	--	<250	--	
	12/12/17	7.70	240.13	<100	<1	<1	<1	<3	--	--	--	<50	--	<250	--	
	03/23/18	7.44	240.39	<100	<1	<1	<1	<3	--	--	--	71 ^x	--	<250	--	
06/21/18	7.75	240.08	<100	<1	<1	<1	<3	--	--	--	150 ^x	--	<450	--		
MW109	03/17/16	--	5.42	--	<100	<1	<1	<1	<3	--	--	--	97 ^x	--	<250	--
	06/24/16		3.35	--	<100	<1	<1	<1	<3	--	--	--	160 ^x	--	<250	--
	09/28/16		3.96	--	<100	<1	<1	<1	<3	--	--	--	260 ^x	--	<250	--
	12/23/16		6.59	--	250	<1	<1	<1	<3	--	--	--	430 ^x	<50	<250	<250
	03/03/17		6.70	--	370	<1	<1	1.2	<3	--	--	--	490 ^x	55 ^x	<250	<250
	06/14/17	6.87	241.05	220	<1	<1	<1	<3	--	--	--	330	--	<250	--	
	09/14/17	6.84	241.08	<100	<1	<1	<1	<3	--	--	--	140 ^x	--	<300	--	
	12/12/17	7.69	240.23	150	<1	1.1	<1	<3	--	--	--	<50	--	<250	--	
	03/23/18	7.75	240.17	190	<1	<1	1.1	<3	--	--	--	110 ^x	--	<250	--	
06/21/18	7.87	240.05	190	<1	1.2	<1	<3	--	--	--	200	--	<250	--		
MTCA Method A Cleanup Levels for Groundwater ⁽⁵⁾					1,000/800 ⁽⁶⁾	5	1,000	700	1,000	20	5	0.01	500	500	500	500



Table 1
Summary of Groundwater Data
SKS Shell Station Site
3901 Southwest Alaska Street
Seattle, Washington

Well ID	Sample Date	Top of Well Casing	Depth to Groundwater (feet below TOC)	Relative Groundwater Elevation ⁽¹⁾⁽⁷⁾	Analytical Results (µg/L)												
					GRPH ⁽²⁾	Benzene ⁽³⁾	Toluene ⁽³⁾	Ethylbenzene ⁽³⁾	Total Xylenes ⁽³⁾	MTBE ⁽³⁾	EDC ⁽³⁾	EDB ⁽³⁾	DRPH ⁽²⁾	DRPH with Silica Gel ⁽⁴⁾	ORPH ⁽²⁾	ORPH with Silica Gel ⁽⁴⁾	
MW110	03/17/16	--	5.70	--	<100	<1	<1	<1	<1	<3	--	--	--	<50	--	<250	--
	06/24/16		3.56	--	<100	<1	<1	<1	<1	<3	--	--	--	100 ^x	--	<250	--
	09/28/16		4.19	--	<100	<1	<1	<1	<1	<3	--	--	--	590 ^x	--	440 ^x	--
	12/23/16		6.96	--	500	2.3	<1	9.7	18	--	--	--	1,200	68 ^x	<300	<300	
	03/03/17	248.21	7.57	--	570	2.1	<1	9.3	4.7	--	--	--	1,000 ^x	110 ^x	<250	<250	
	06/14/17		7.78	240.43	260	<1	<1	2.0	<3	--	--	--	520	--	<250	--	
	09/14/17		7.44	240.77	<100	<1	<1	<1	<3	--	--	--	150 ^x	--	<250	--	
	12/12/17		8.02	240.19	<100	<1	<1	<1	<3	--	--	--	99 ^x	--	<250	--	
	03/23/18		8.05	240.16	<100	<1	<1	<1	<3	--	--	--	73 ^x	--	<250	--	
06/21/18	8.15	240.06	<100	<1	<1	<1	<3	--	--	--	96 ^x	--	<250	--			
MW113	03/23/18	248.06	7.68	240.38	<100	<1	<1	<1	<3	--	--	--	93 ^x	--	<250	--	
	06/21/18		7.81	240.25	<100	<1	<1	<1	<3	--	--	--	71 ^x	--	<250	--	
MTCA Method A Cleanup Levels for Groundwater⁽⁵⁾					1,000/800⁽⁶⁾	5	1,000	700	1,000	20	5	0.01	500	500	500	500	

NOTES:

Red indicates concentrations exceeding MTCA Method A cleanup levels for groundwater.

Samples analyzed by Friedman & Bruya, Inc. of Seattle, Washington.

2011 Samples analyzed for G-Logics by Fremont Analytical of Seattle, Washington.

2012 Samples analyzed by Friedman & Bruya, Inc. of Seattle, Washington.

⁽¹⁾Elevation reference datum North American Vertical Datum of 1988 (Dowl HKM November 2012).

⁽²⁾Analyzed by Method NWTPH-Gx (gasoline) and NWTPH-Dx (diesel and oil).

⁽³⁾Analyzed by EPA Method 8260B, 8260C, or 8021B.

⁽⁴⁾Analyzed by Method NWTPH-Dx; sample extracts passed through a silica gel column prior to analysis.

⁽⁵⁾MTCA Cleanup Regulation, Method A Cleanup Levels, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, revised November 2007.

⁽⁶⁾1,000 µg/L when benzene is not present and 800 µg/L when benzene is present.

⁽⁷⁾Top of well casing elevations for MW108, MW109, MW110, and MW113 are estimated based on parking garage design elevations.

Laboratory Note:

^{*}The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

-- = not analyzed, not measured

< = not detected above the laboratory reporting limit

µg/L = micrograms per liter

DRPH = diesel-range petroleum hydrocarbons

EDB = 1,2 dibromoethane

EDC = 1,2 dichloroethane

EPA = U.S. Environmental Protection Agency

GRPH = gasoline-range petroleum hydrocarbons

MTBE = methyl tertiary-butyl ether

MTCA = Washington State Model Toxics Control Act

NWTPH = Northwest Total Petroleum Hydrocarbon

ORPH = oil-range petroleum hydrocarbons

TOC = top of casing elevation

CHARTS

Chart 1
GRPH and Benzene Concentrations - MW104
SKS Shell Station Site
3901 Southwest Alaska Street
Seattle, Washington

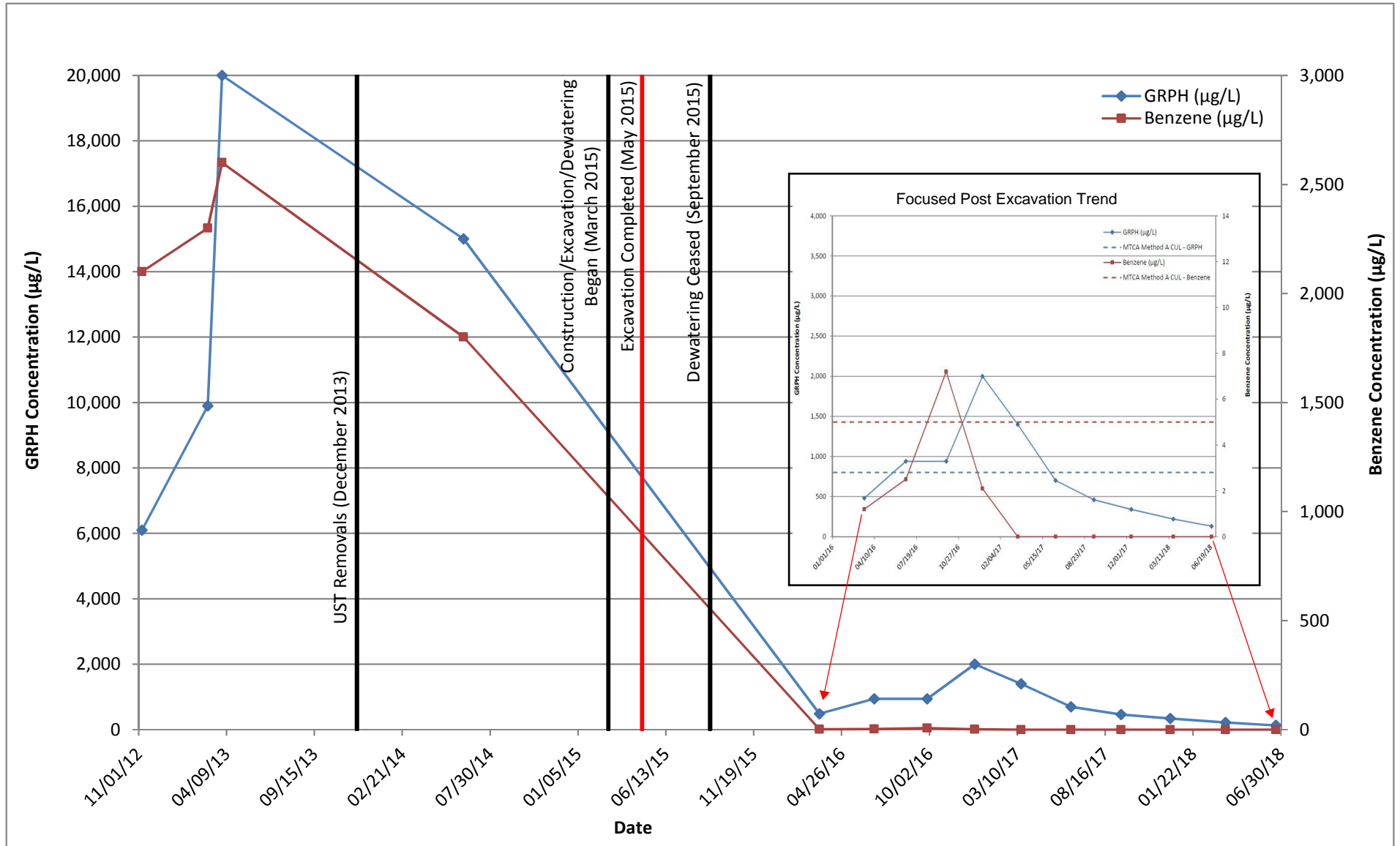


Chart 2
GRPH and Benzene Concentrations - GLMW01/MW109
SKS Shell Station Site
3901 Southwest Alaska Street
Seattle, Washington

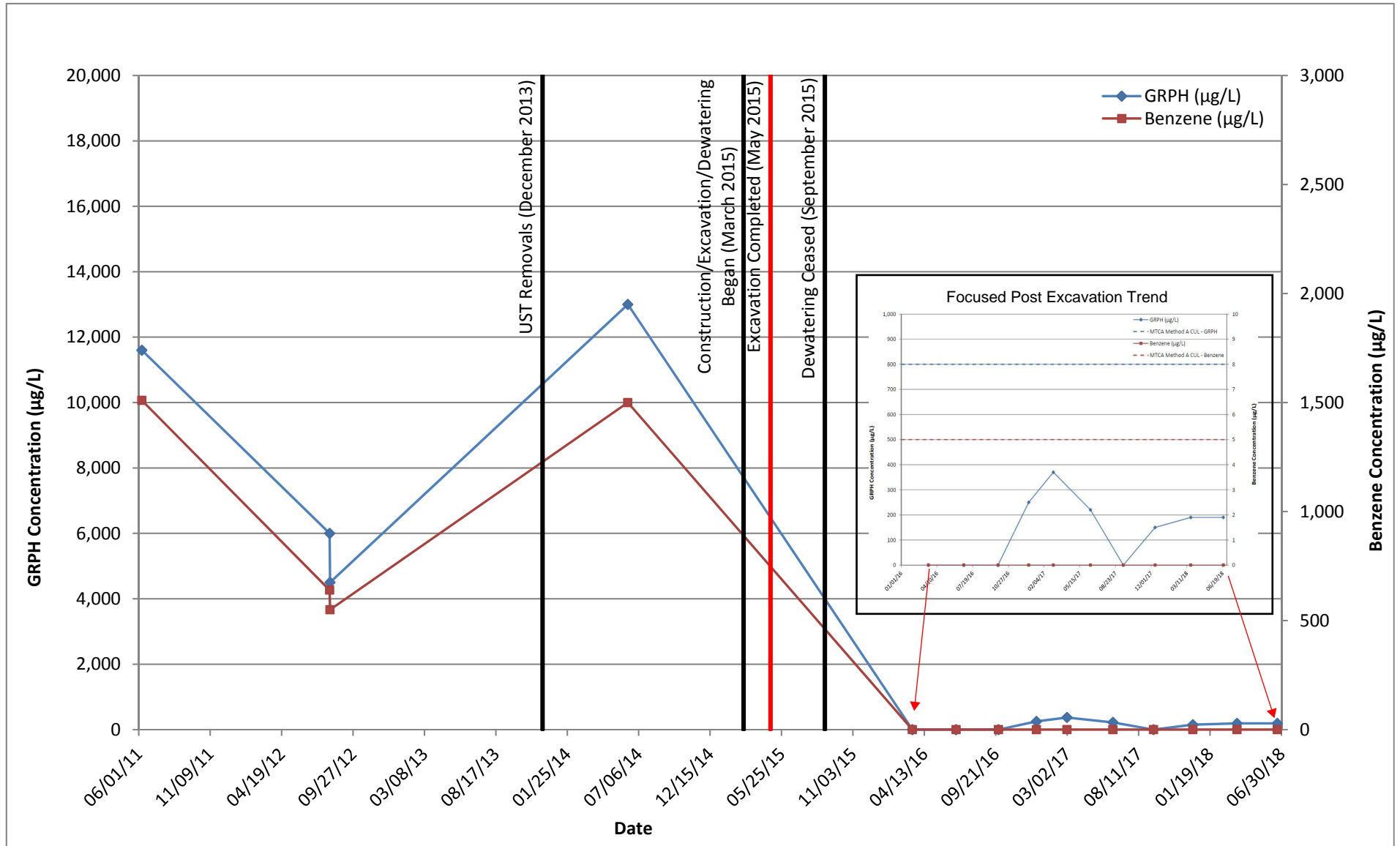


Chart 3
GRPH and Benzene Concentrations - MW110/MW-2
SKS Shell Station Site
3901 Southwest Alaska Street
Seattle, Washington

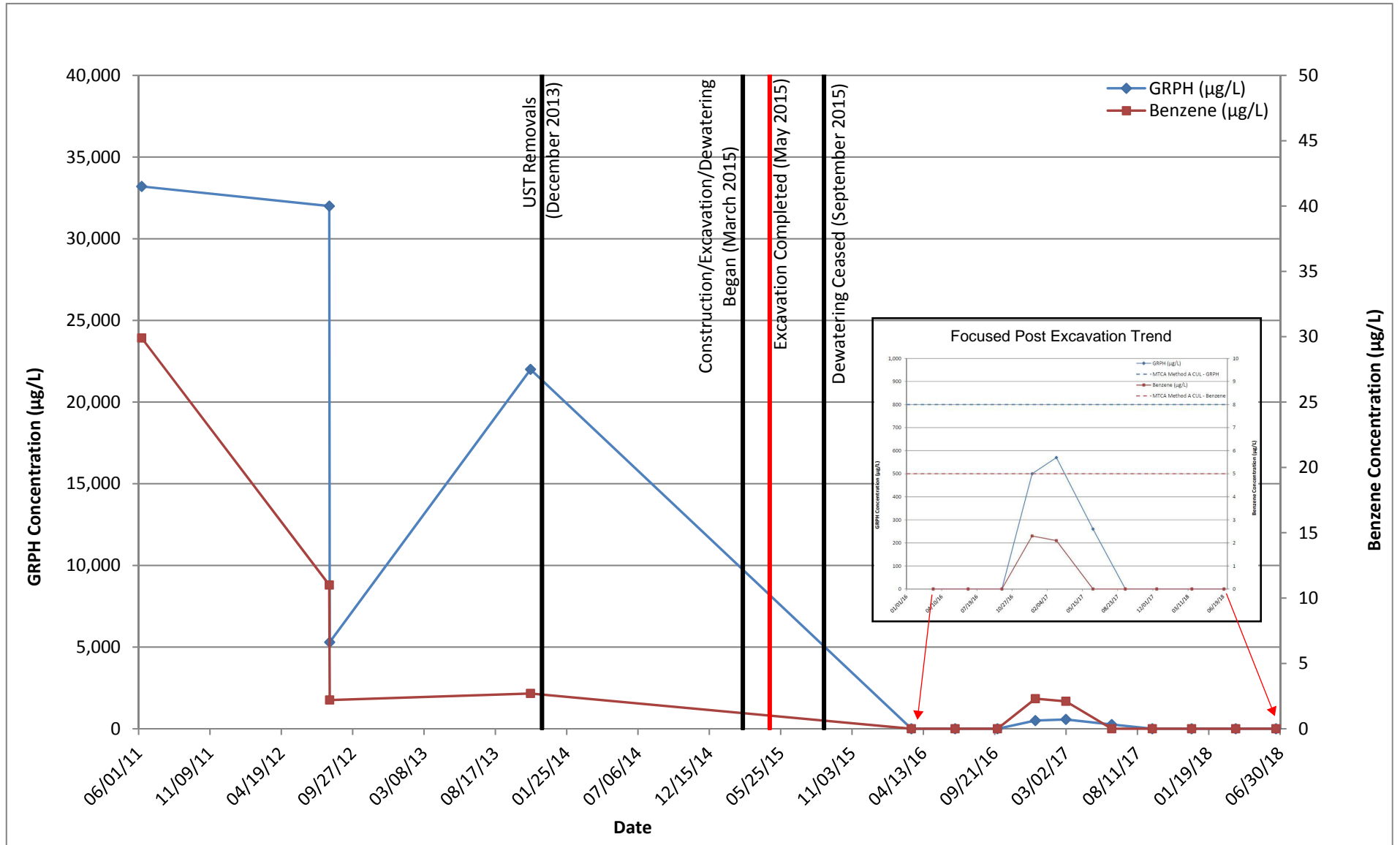
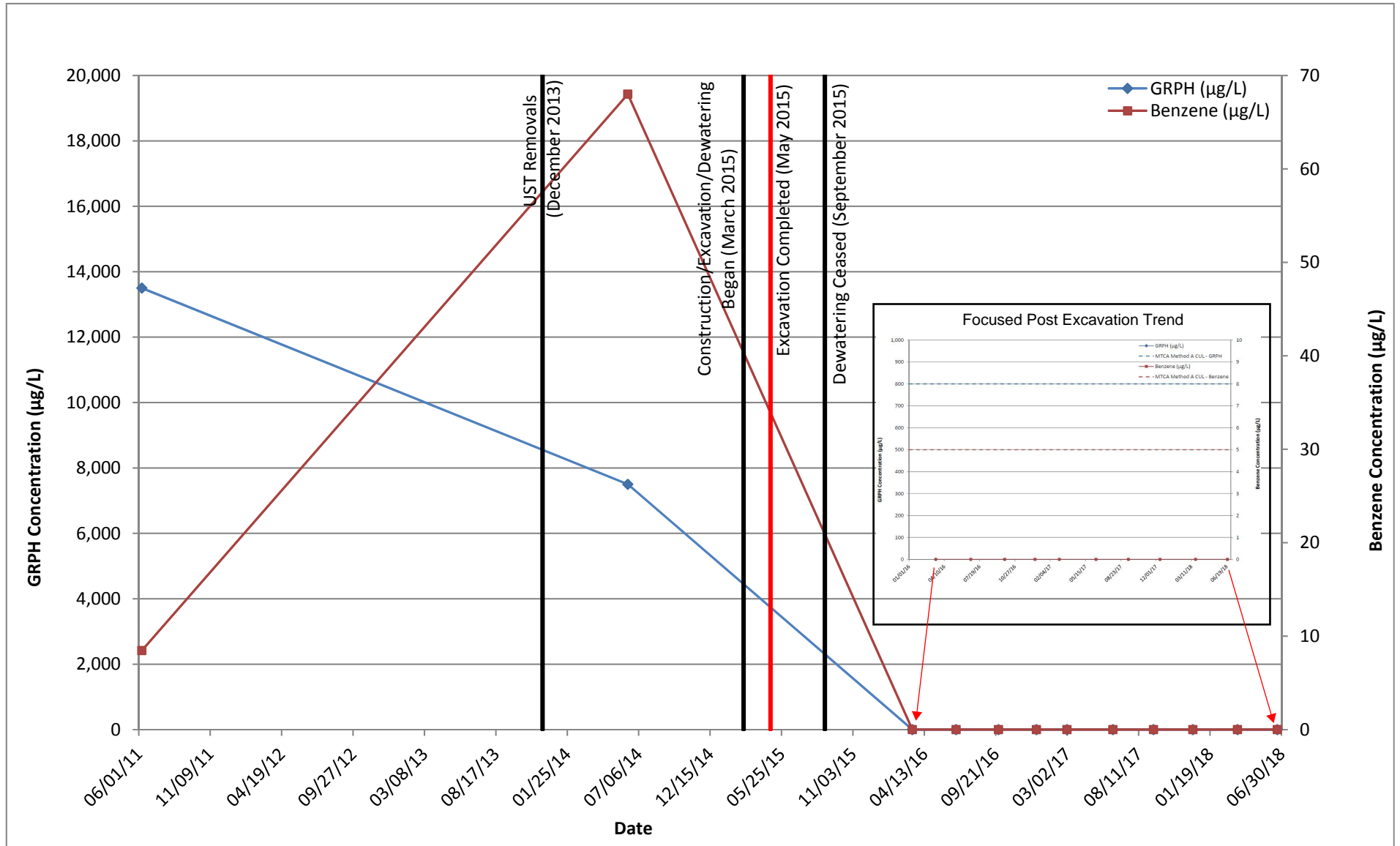


Chart 4
GRPH and Benzene Concentrations - MW-3/MW108
SKS Shell Station Site
3901 Southwest Alaska Street
Seattle, Washington



ATTACHMENT A
LABORATORY ANALYTICAL REPORT

Friedman & Bruya, Inc. #806428

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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

June 28, 2018

Rob Roberts, Project Manager
SoundEarth Strategies
2811 Fairview Ave. East, Suite 2000
Seattle, WA 98102

Dear Mr Roberts:

Included are the results from the testing of material submitted on June 22, 2018 from the SOU_0914-001_ 20180622, F&BI 806428 project. There are 7 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures

c: Jonathan Loeffler, Clare Tochilin
SOU0628R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on June 22, 2018 by Friedman & Bruya, Inc. from the SoundEarth Strategies SOU_0914-001_ 20180622, F&BI 806428 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>SoundEarth Strategies</u>
806428 -01	MW103-20180621
806428 -02	MW113-20180621
806428 -03	MW105-20180621
806428 -04	MW99-20180622
806428 -05	MW110-20180621
806428 -06	MW101-20180621
806428 -07	RW04-20180621
806428 -08	MW108-20180621
806428 -09	RW05-20180621
806428 -10	MW104-20180621
806428 -11	MW109-20180621
806428 -12	MW102-20180622
806428 -13	RW03-20180622

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/28/18
 Date Received: 06/22/18
 Project: SOU_0914-001_20180622, F&BI 806428
 Date Extracted: 06/25/18
 Date Analyzed: 06/25/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
 FOR BENZENE, TOLUENE, ETHYLBENZENE,
 XYLENES AND TPH AS GASOLINE
 USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW113-20180621 806428-02	<1	<1	<1	<3	<100	68
MW105-20180621 806428-03	<1	<1	<1	<3	<100	68
MW99-20180622 806428-04	<1	1.3	30	33	670	77
MW110-20180621 806428-05	<1	<1	<1	<3	<100	68
MW101-20180621 806428-06	<1	<1	<1	<3	<100	68
RW04-20180621 806428-07	<1	2.6	4.8	4.5	360	74
MW108-20180621 806428-08	<1	<1	<1	<3	<100	68
RW05-20180621 806428-09	<1	1.4	1.4	<3	140	69
MW104-20180621 806428-10	<1	<1	<1	<3	130	69
MW109-20180621 806428-11	<1	1.2	<1	<3	190	68
MW102-20180622 806428-12	<1	<1	<1	<3	<100	68

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/28/18
Date Received: 06/22/18
Project: SOU_0914-001_ 20180622, F&BI 806428
Date Extracted: 06/25/18
Date Analyzed: 06/25/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES AND TPH AS GASOLINE
USING METHODS 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
RW03-20180622 806428-13	<1	2.3	31	34	730	77
Method Blank 08-1282 MB	<1	<1	<1	<3	<100	71

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/28/18
 Date Received: 06/22/18
 Project: SOU_0914-001_20180622, F&BI 806428
 Date Extracted: 06/25/18
 Date Analyzed: 06/25/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
 FOR TOTAL PETROLEUM HYDROCARBONS AS
 DIESEL AND MOTOR OIL
 USING METHOD NWTPH-Dx**
 Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 41-152)
MW113-20180621 806428-02	71 x	<250	98
MW105-20180621 806428-03	<50	<250	94
MW99-20180622 806428-04	850 x	<250	95
MW110-20180621 806428-05	96 x	<250	92
MW101-20180621 806428-06	<50	<250	93
RW04-20180621 806428-07	400 x	<250	97
MW108-20180621 806428-08 1/1.8	150 x	<450	90
RW05-20180621 806428-09	180 x	<250	88
MW104-20180621 806428-10 1/1.4	720	<350	93
MW109-20180621 806428-11	200	<250	95
MW102-20180622 806428-12	<50	<250	101
RW03-20180622 806428-13	740 x	<250	86
Method Blank 08-1372 MB	<50	<250	94

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/28/18

Date Received: 06/22/18

Project: SOU_0914-001_20180622, F&BI 806428

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES, AND TPH AS GASOLINE
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 806345-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	108	65-118
Toluene	ug/L (ppb)	50	103	72-122
Ethylbenzene	ug/L (ppb)	50	104	73-126
Xylenes	ug/L (ppb)	150	101	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/28/18

Date Received: 06/22/18

Project: SOU_0914-001_20180622, F&BI 806428

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

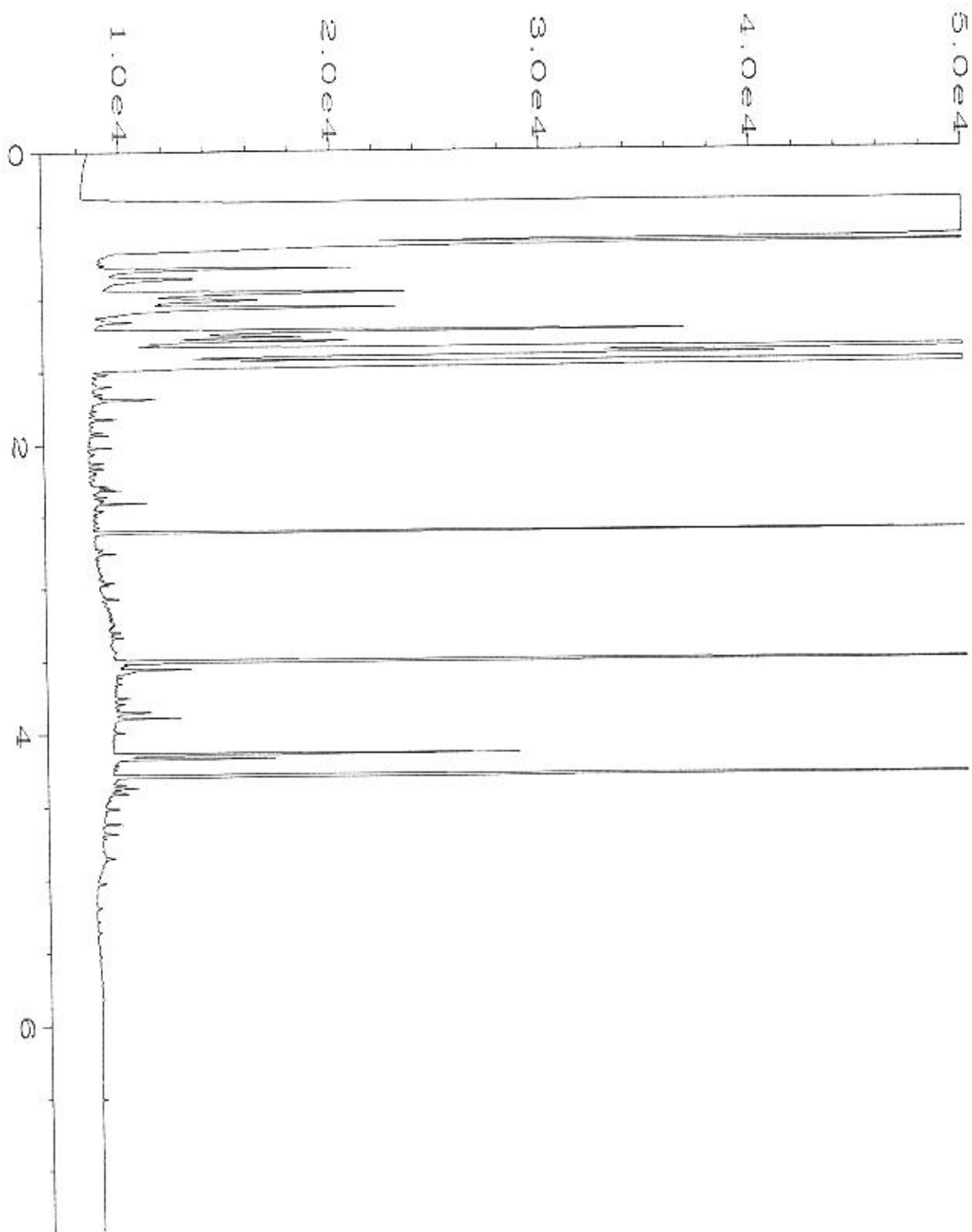
Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	80	96	63-142	18

FRIEDMAN & BRUYA, INC.

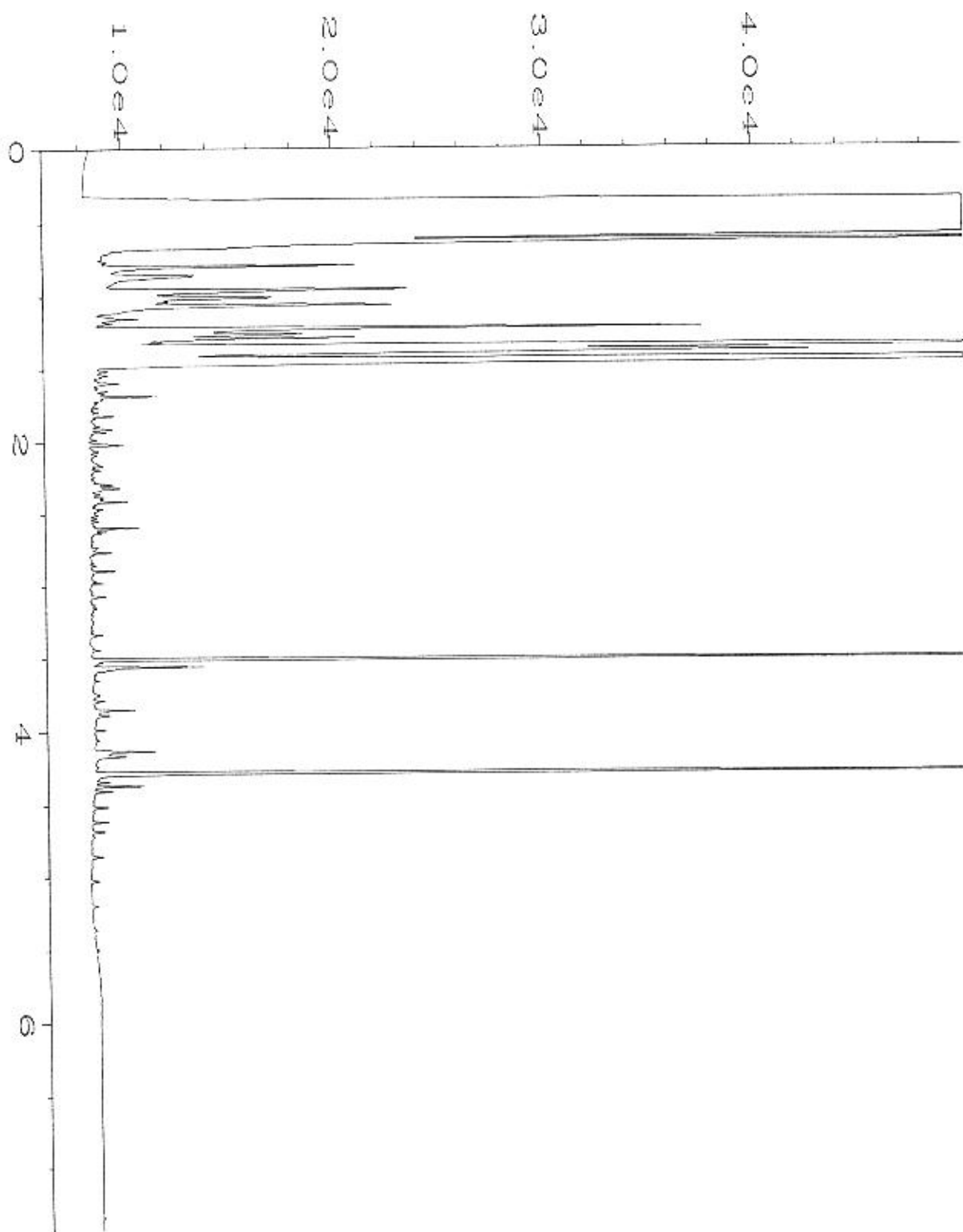
ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

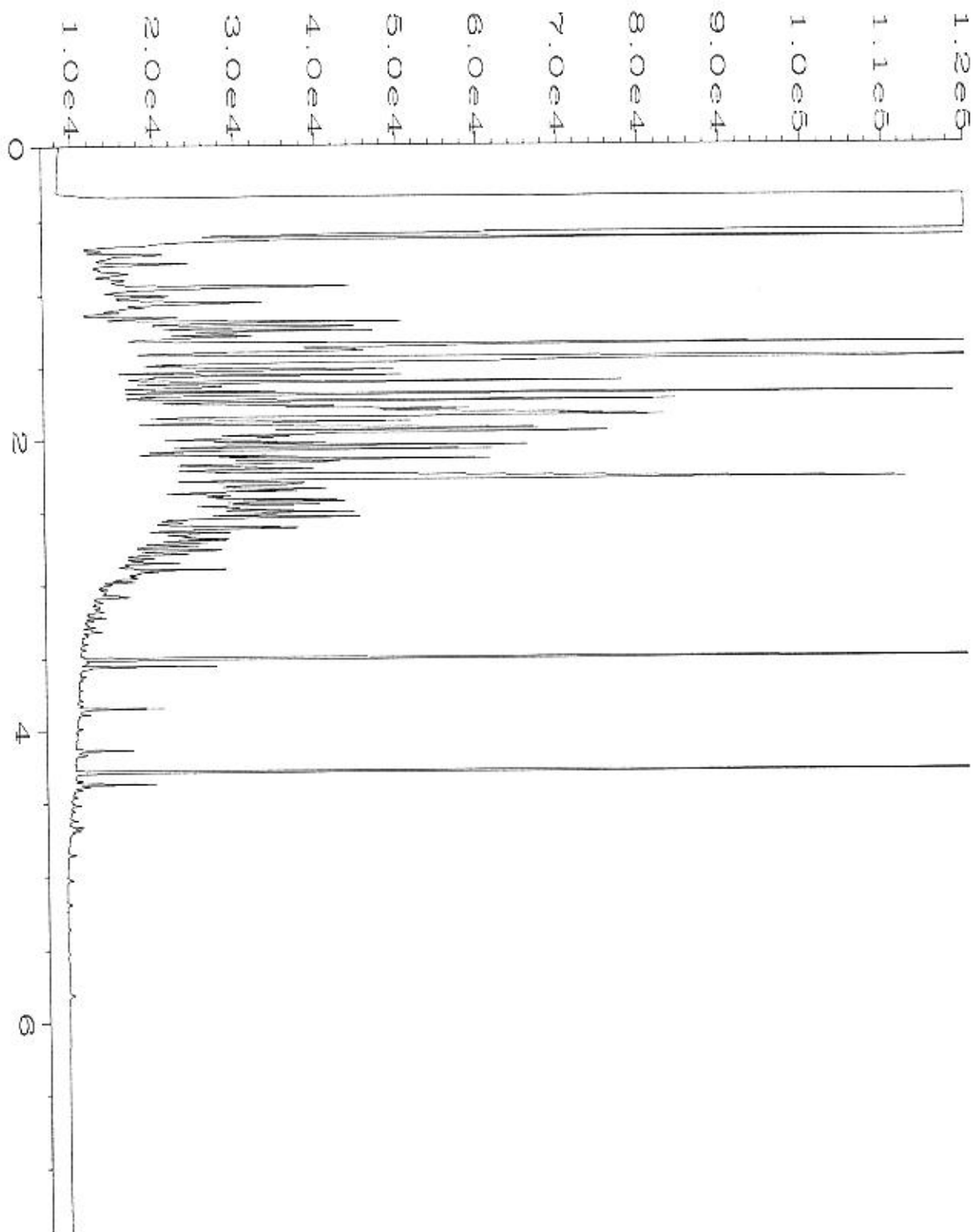
- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The compound is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.
- j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



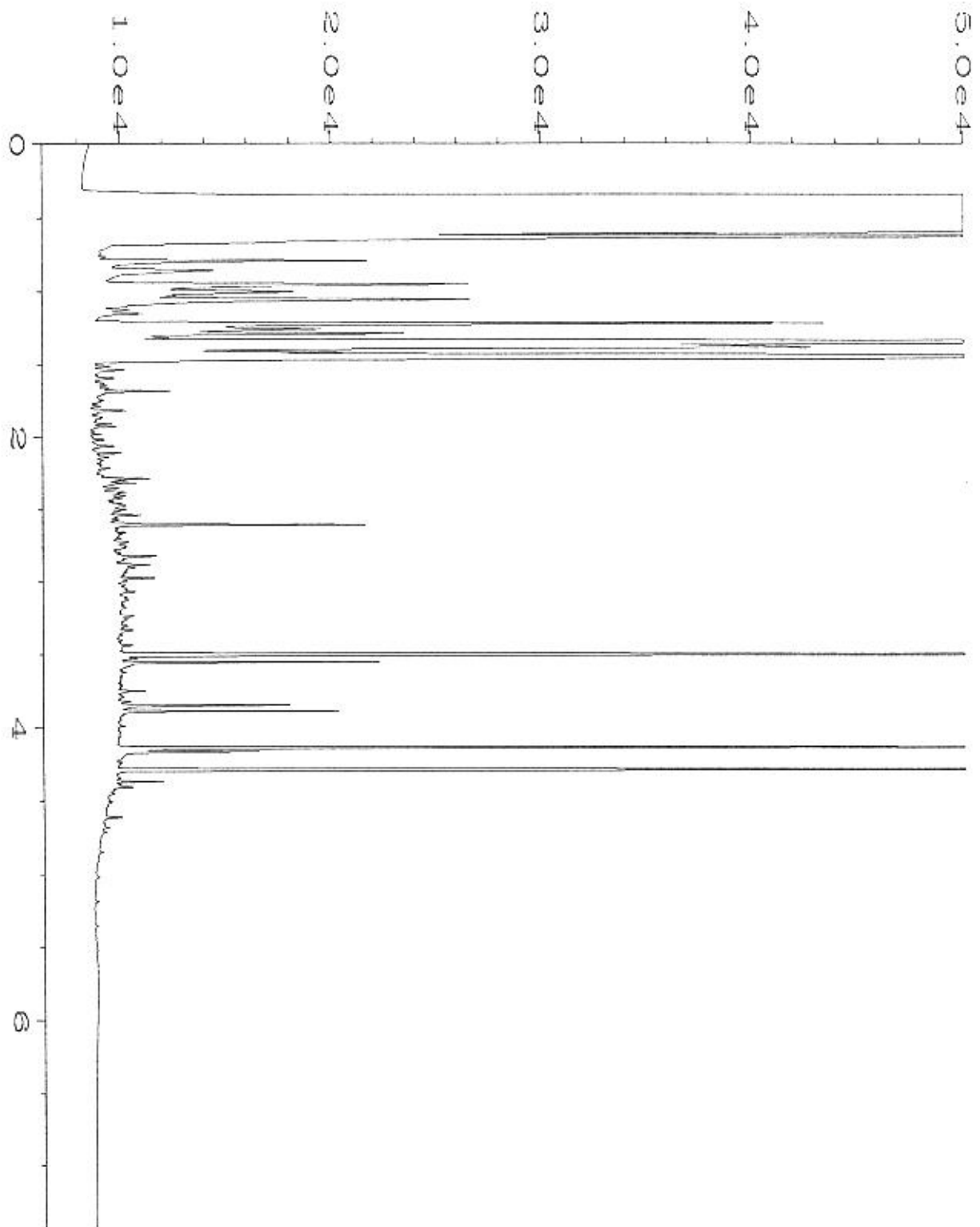
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Instrument	: GC1	Injection Number	: 1
Sample Name	: 806428-02	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 25 Jun 18 02:26 PM	Analysis Method	: DX.MTH
Report Created on:	26 Jun 18 11:23 AM		



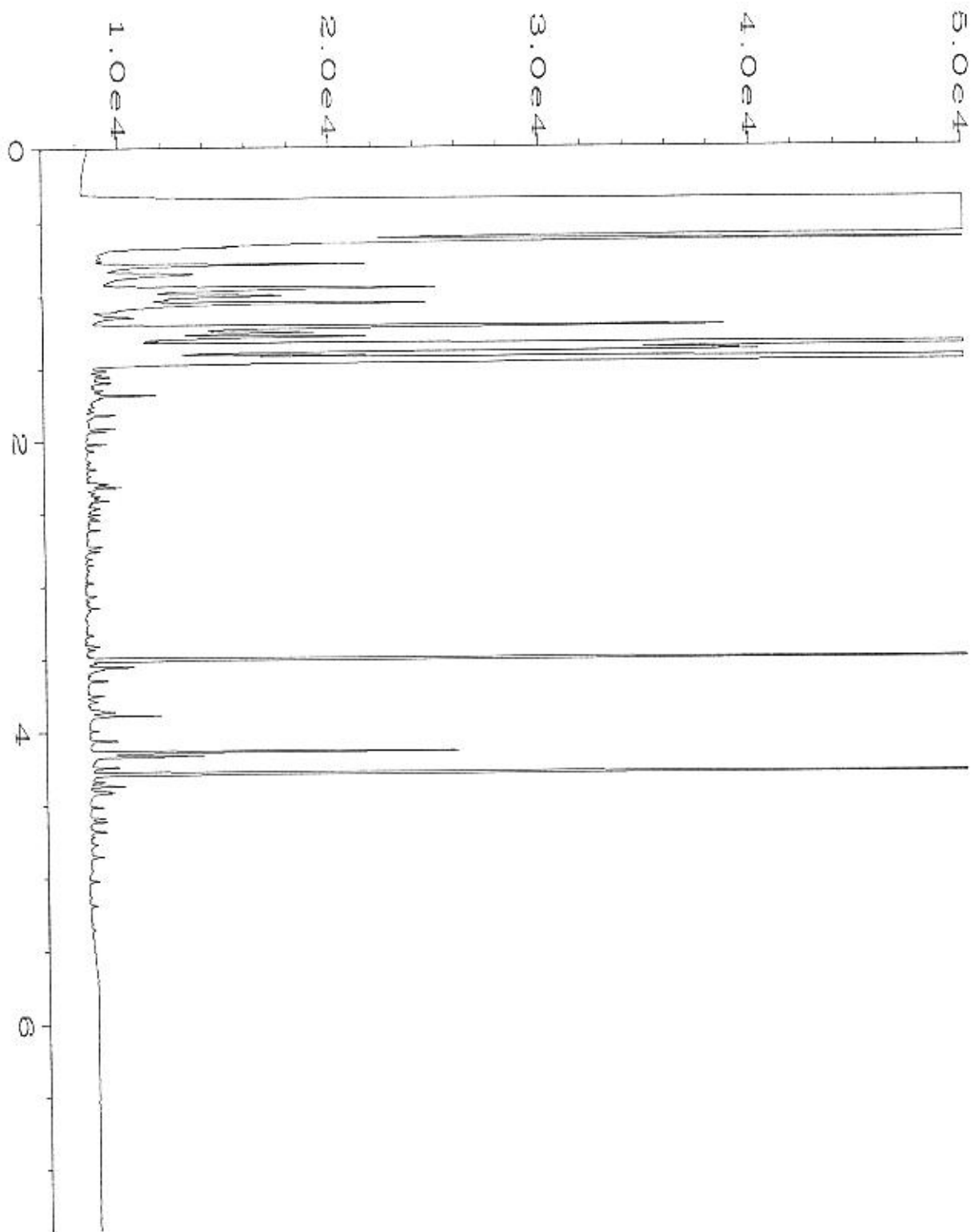
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Instrument	: GC1	Injection Number	: 1
Sample Name	: 806428-03	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 25 Jun 18 02:38 PM	Analysis Method	: DX.MTH
Report Created on:	26 Jun 18 11:23 AM		



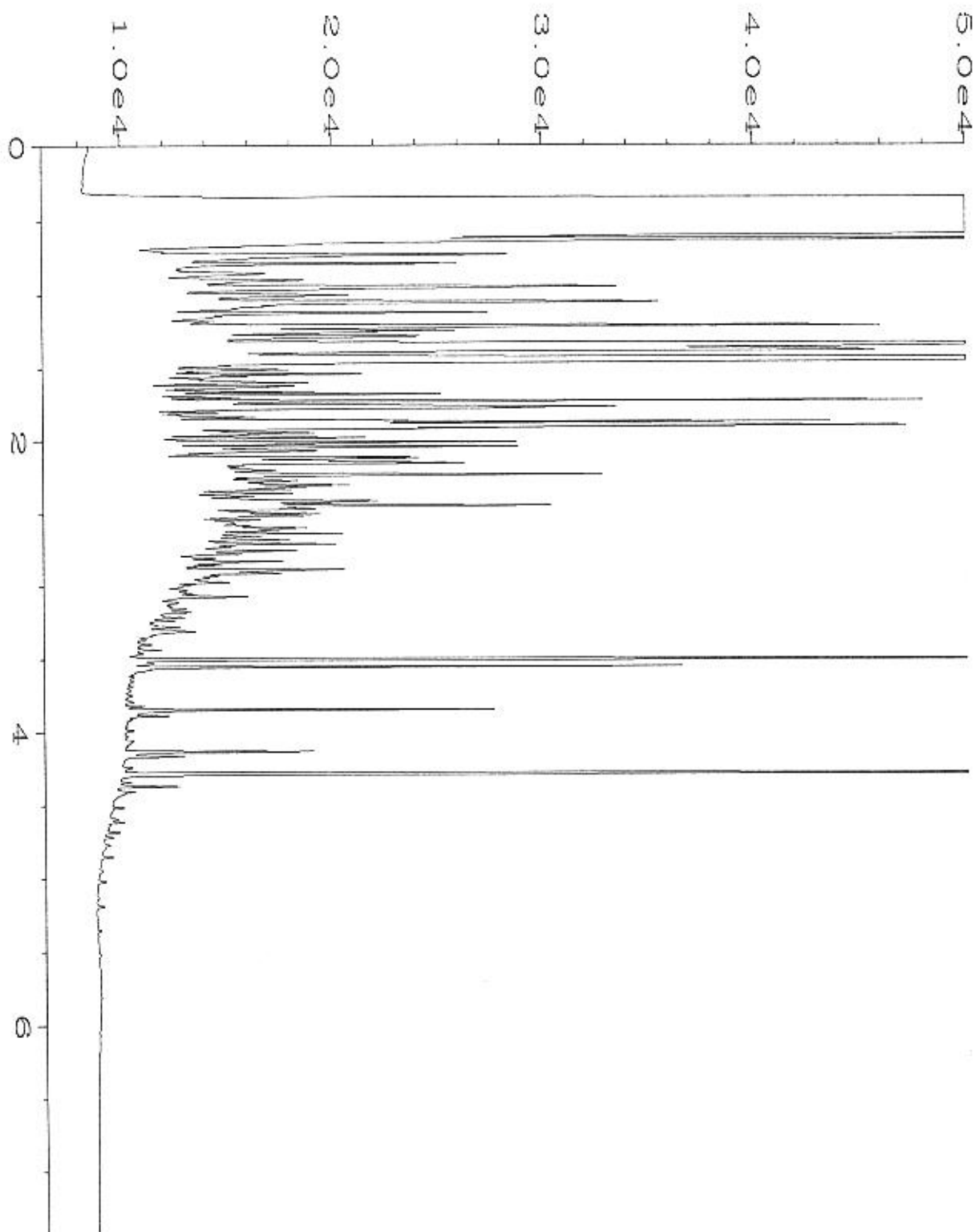
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Instrument	: GC1	Injection Number	: 1
Sample Name	: 806428-04	Sequence Line	: 8
Run Time Bar Code:		Instrument Method:	DX.MTH
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Report Created on:	26 Jun 18 11:24 AM		



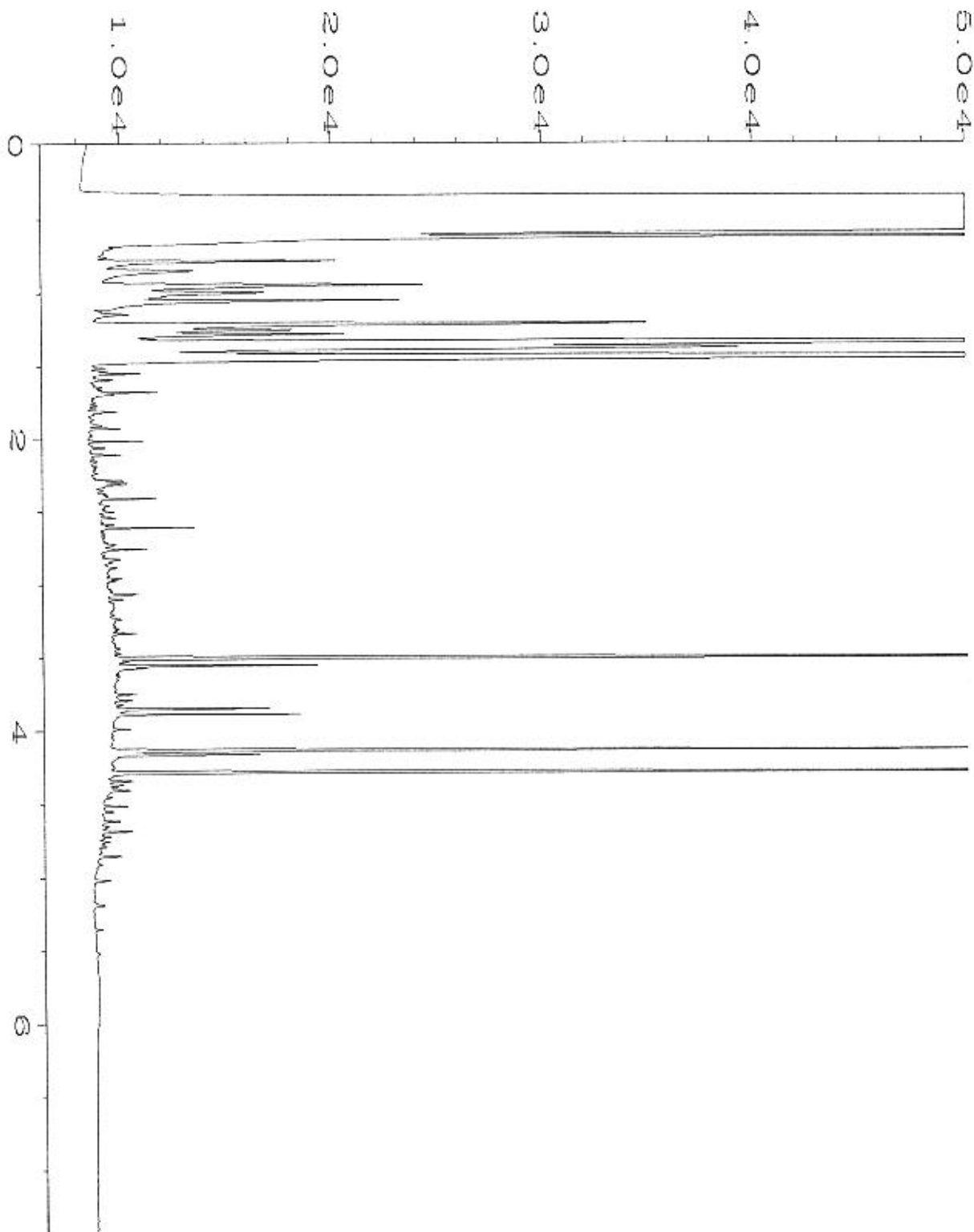
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Instrument	: GC1	Injection Number	: 1
Sample Name	: 806428-05	Sequence Line	: 8
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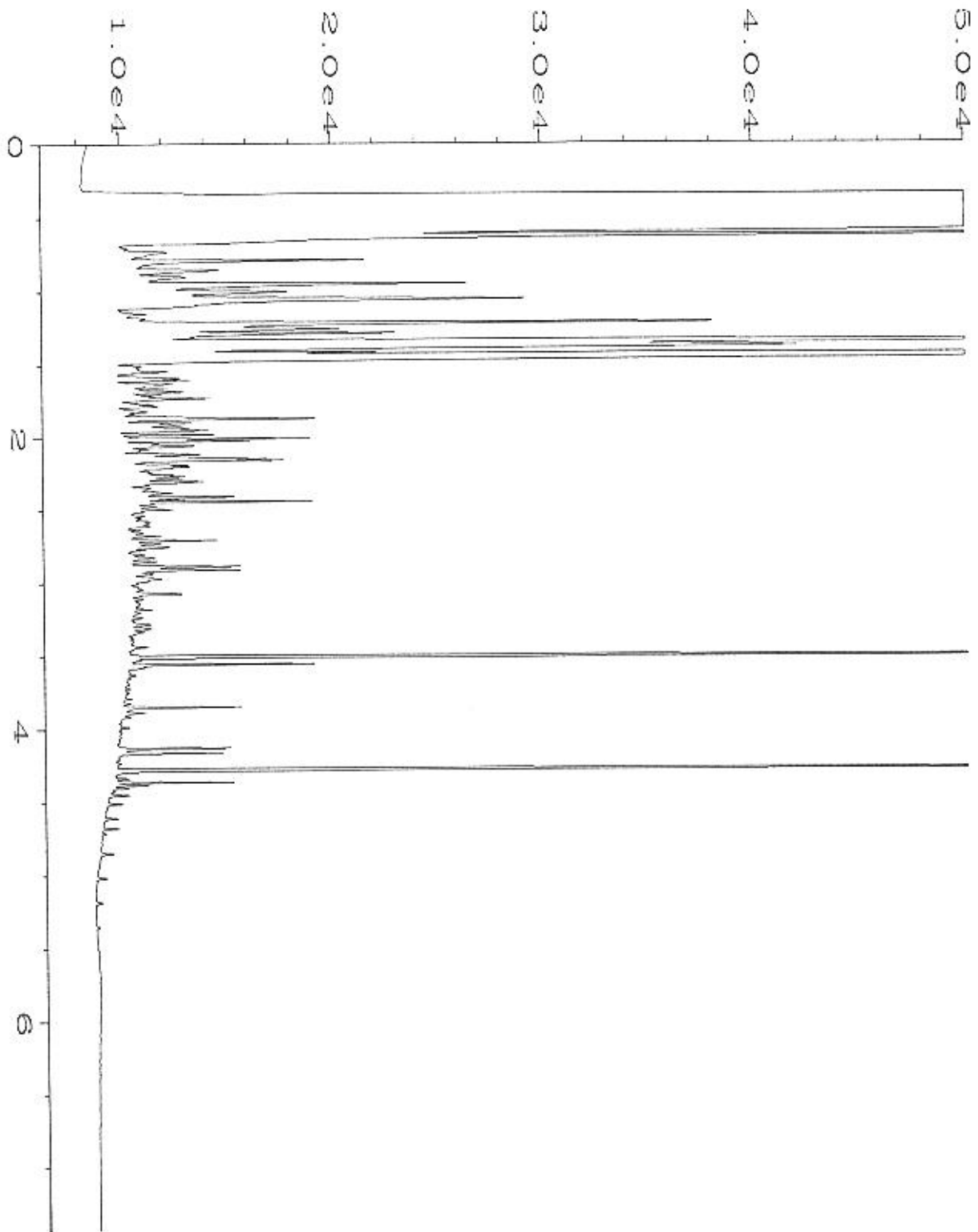
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Instrument	: GC1	Injection Number	: 1
Sample Name	: 806428-06	Sequence Line	: 8
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 25 Jun 18 04:00 PM	Analysis Method	: DX.MTH
Report Created on:	26 Jun 18 11:24 AM		



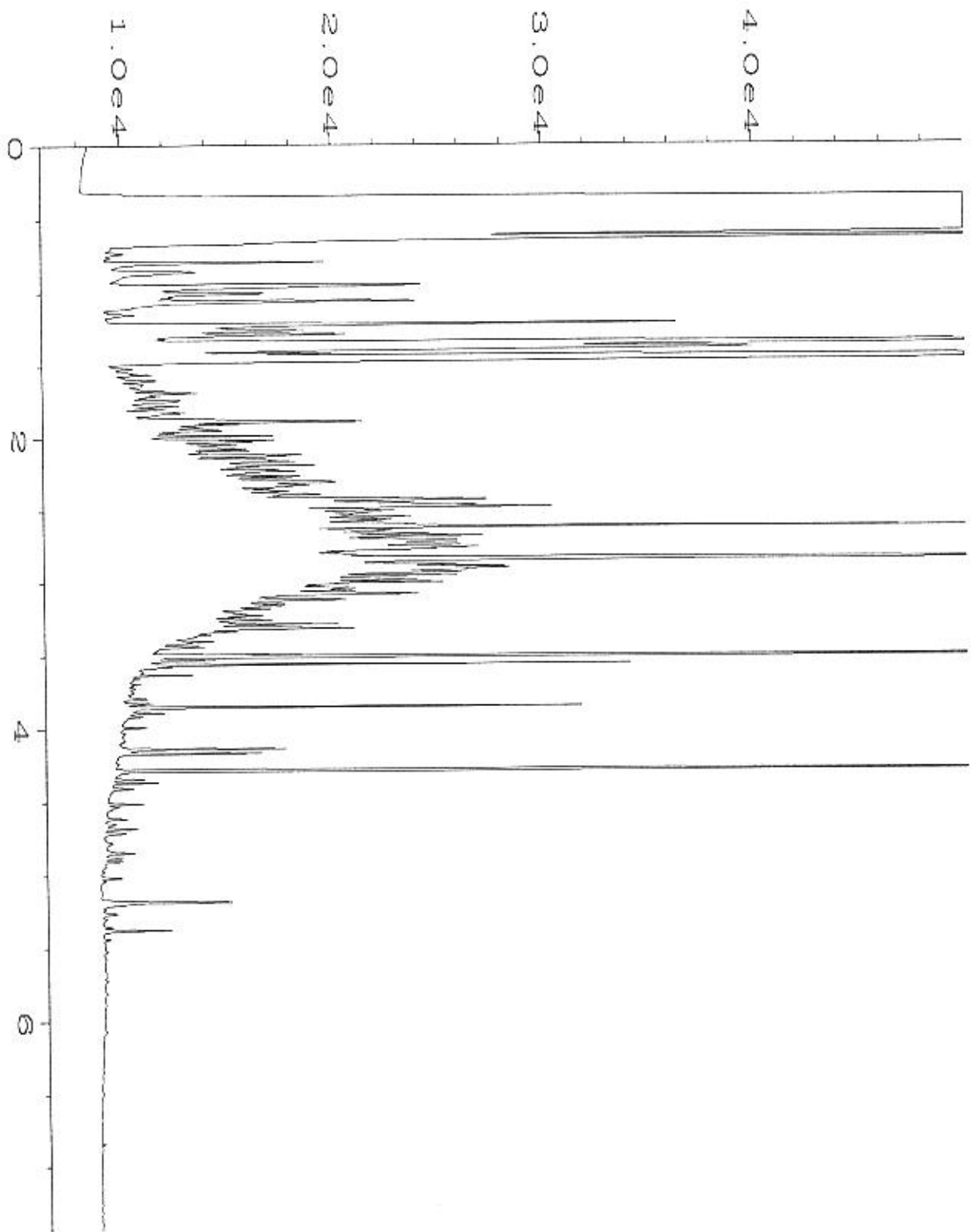
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Sample Name	: 806428-07	Sequence Line	: 8
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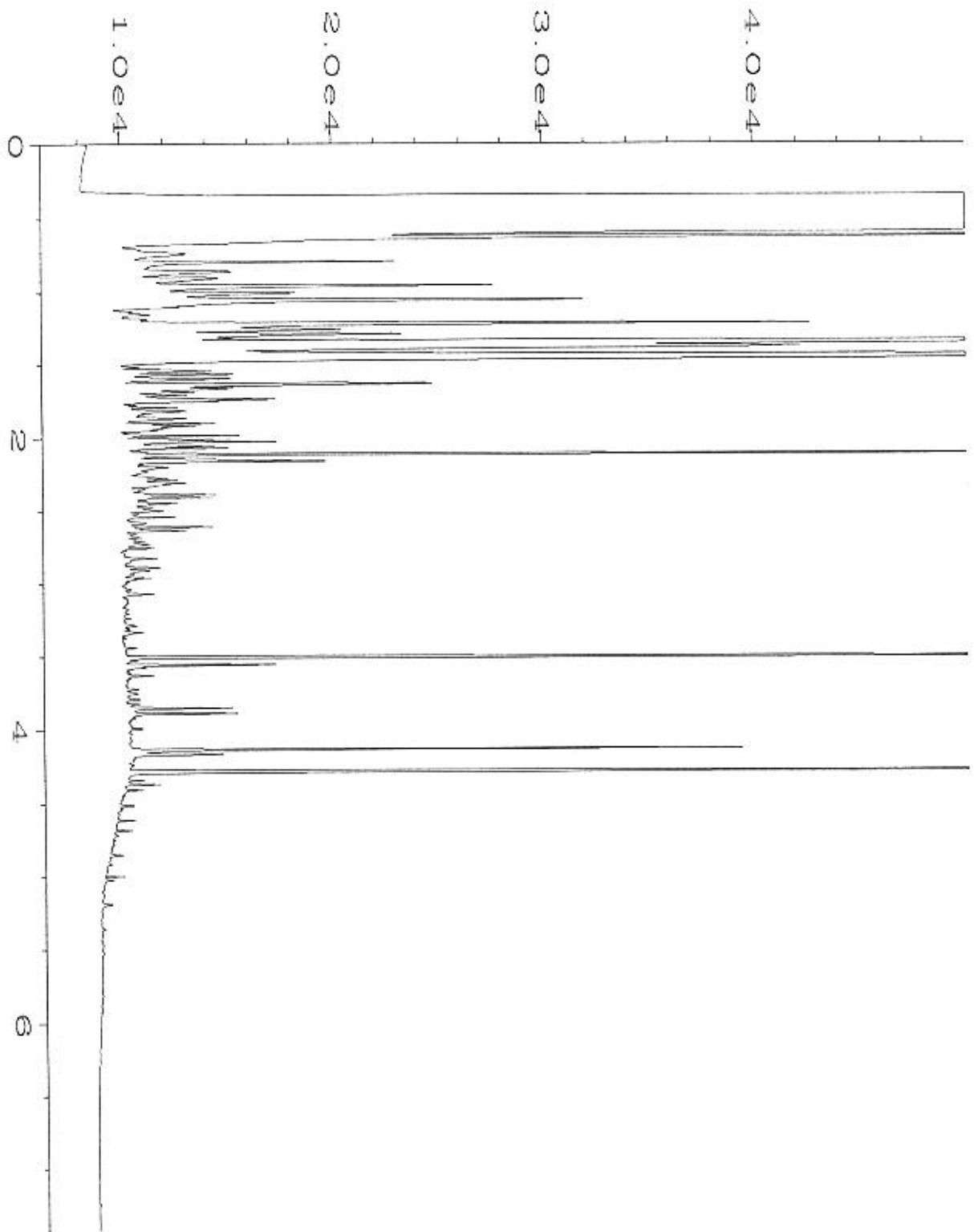
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Instrument	: GC1	Injection Number	: 1
Sample Name	: 806428-08	Sequence Line	: 8
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Report Created on:	26 Jun 18 11:25 AM		



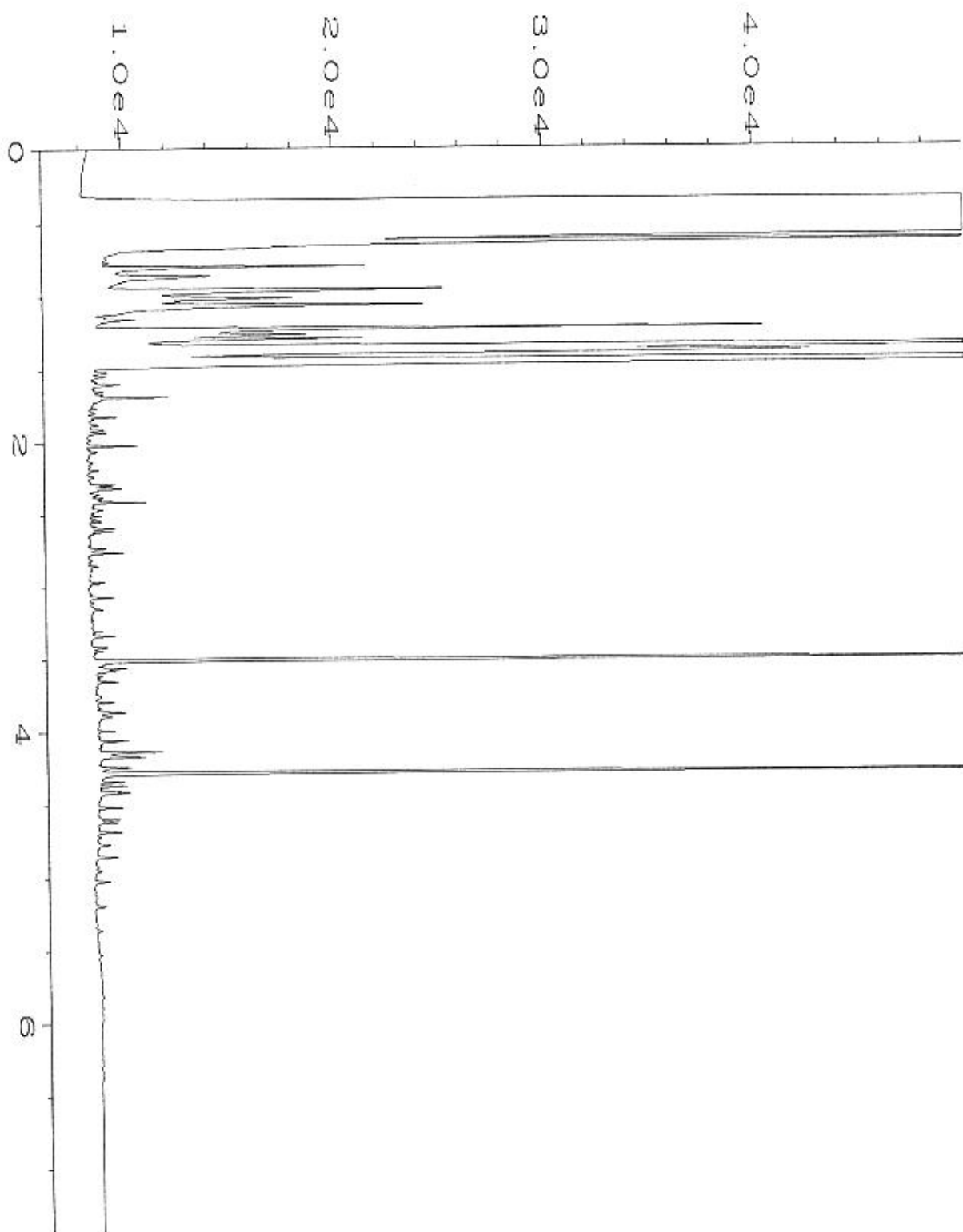
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Instrument	: GC1	Injection Number	: 1
Sample Name	: 806428-09	Sequence Line	: 8
Run Time Bar Code:		Instrument Method:	DX.MTH
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Report Created on:	26 Jun 18 11:25 AM		



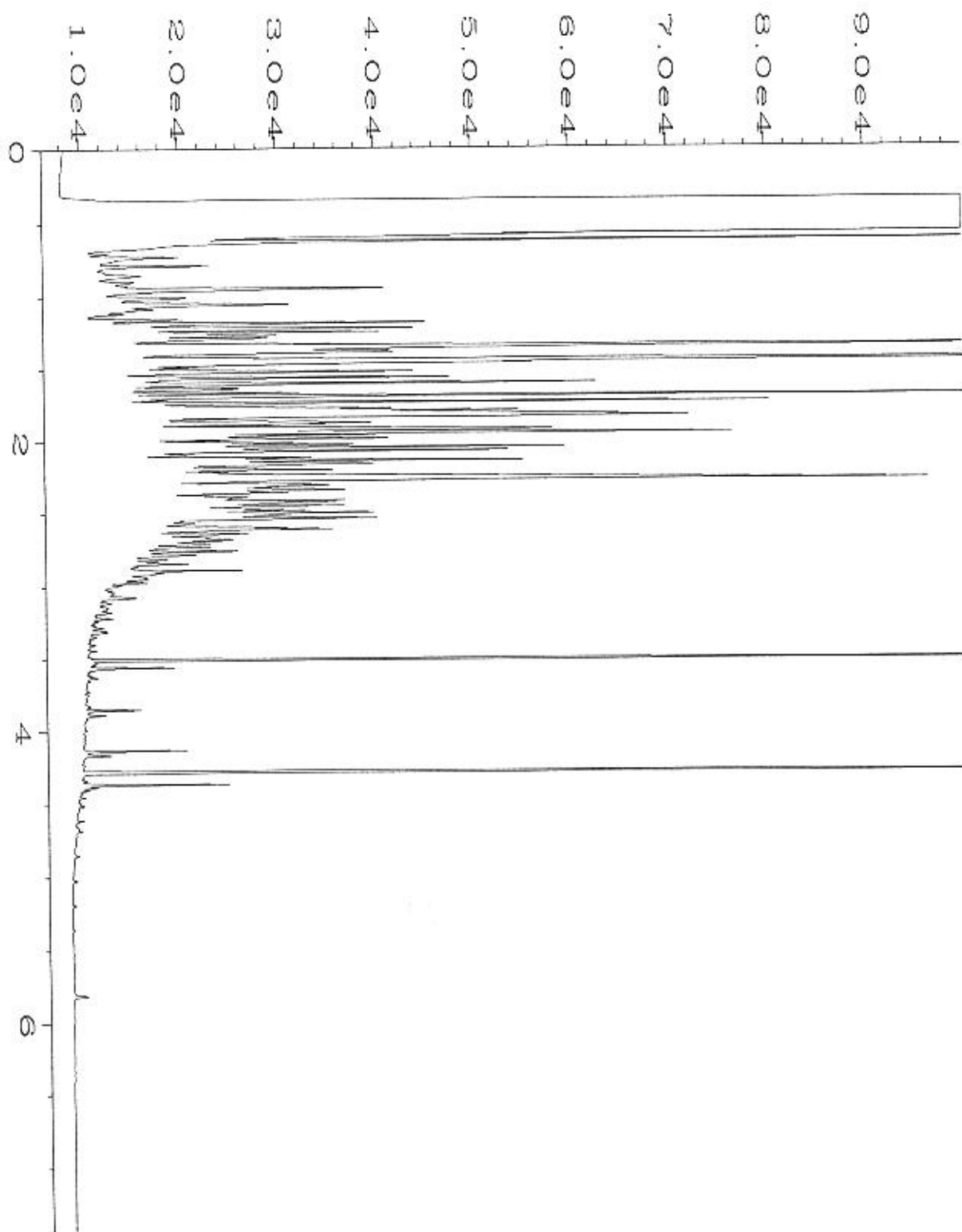
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Sample Name	: 806428-10	Sequence Line	: 8
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Report Created on:	26 Jun 18 11:25 AM		



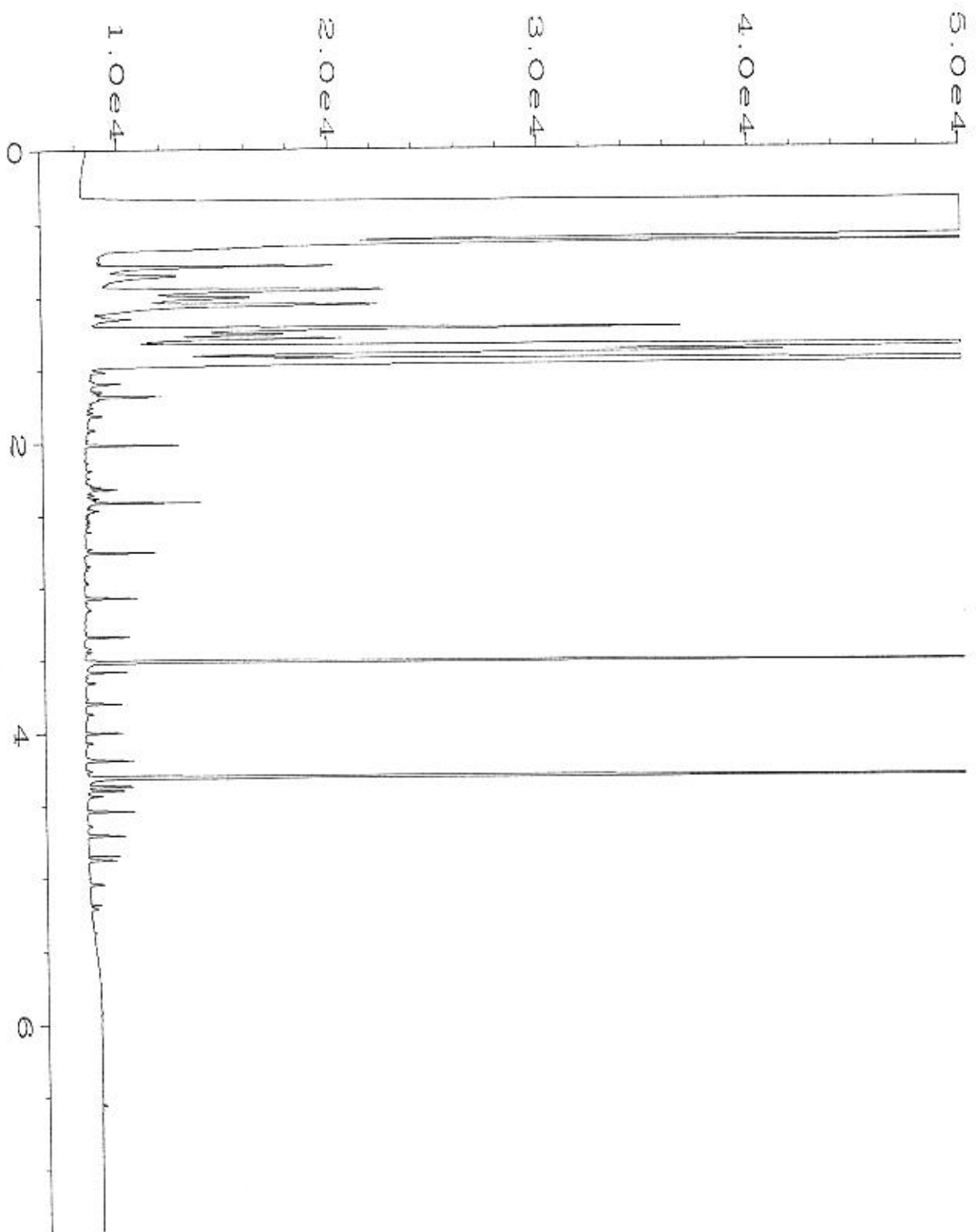
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Instrument	: GC1	Injection Number	: 1
Sample Name	: 806428-11	Sequence Line	: 8
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Report Created on:	26 Jun 18 11:25 AM		



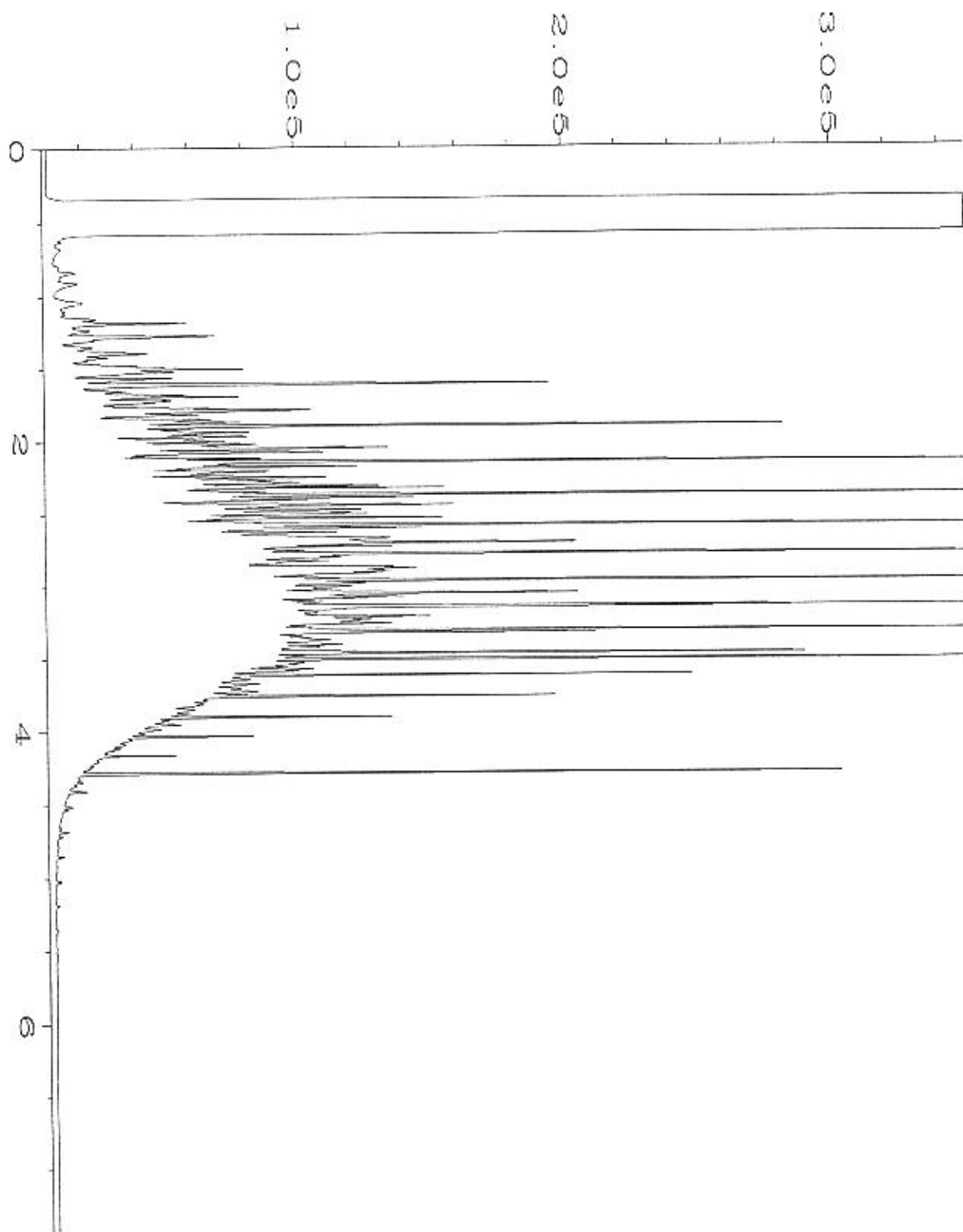
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Sample Name	: 806428-12	Sequence Line	: 8
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 25 Jun 18 05:09 PM	Analysis Method	: DX.MTH
Report Created on:	26 Jun 18 11:25 AM		



Data File Name	: C:\HPCHEM\1\DATA\06-25-18\036F0801.D	Page Number	: 1
Operator	: TL	Vial Number	: 36
Instrument	: GC1	Injection Number	: 1
Sample Name	: 806428-13	Sequence Line	: 8
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 25 Jun 18 05:20 PM	Analysis Method	: DX.MTH
Report Created on:	26 Jun 18 11:26 AM		



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Operator	: TL	Vial Number	: 19
Instrument	: GC1	Injection Number	: 1
Sample Name	: 08-1372 mb	Sequence Line	: 6
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 25 Jun 18 01:21 PM	Analysis Method	: DX.MTH
Report Created on:	26 Jun 18 11:23 AM		



Data File Name	: C:\HPCHEM\1\DATA\06-25-18\005F0901.D	Page Number	: 1
Operator	: TL	Vial Number	: 5
Instrument	: GC1	Injection Number	: 1
Sample Name	: 1000 Dx 52-185B	Sequence Line	: 9
Run Time Bar Code:		Instrument Method:	DX.MTH
Acquired on	: 25 Jun 18 05:43 PM	Analysis Method	: DX.MTH
Report Created on:	26 Jun 18 11:24 AM		

80642# 806428

SAMPLE CHAIN OF CUSTODY

ME 6/22/18 A05/VW42

Send Report to: Rob Roberts, cc: Jon Loeffler, Clare Tochilin
 Company SoundEarth Strategies, Inc.
 Address 2811 Fairview Avenue E, Suite 2000
 City, State, ZIP Seattle, Washington 98102
 Phone # 206-306-1900 Fax # 206-306-1907

SAMPLERS (signature) [Signature] Page # 1 of 1
 PROJECT NAME/NO. SKS SHELL / 0914-001 PO # 0914-001
 REMARKS

TURNAROUND TIME
 Standard (2 Weeks)
 RUSH
 Rush charges authorized by: _____
 SAMPLE DISPOSAL
 Dispose after 30 days
 Return samples
 Will call with instructions

Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of Jars	ANALYSES REQUESTED				Notes
								NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	CVOCs by 8260C	
MW103-20180621			01	6/21/18	1200	W	4					HOLD
MW113-20180621			02	↓	1239	W	4	X	X	X		
MW105-20180621			03	↓	1332	W	4	X	X	X		
MW99-20180622			04	6/22/18	1300	W	4	X	X	X		
MW110-20180621			05	6/21/18	1438	W	4	X	X	X		
MW101-20180621			06		1445	W	4	X	X	X		
RW104-20180621			07		1540	W	4	X	X	X		
MW108-20180621			08	↓	1608	W	4	X	X	X		Samples received at 4°C
RW105-20180621			09	↓	1640	W	4	X	X	X		
MW104-20180621			10	↓	1700	W	4	X	X	X		

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <u>[Signature]</u>	Glenn R. McKenny	SES	6/22/18	1346
Received by: <u>[Signature]</u>	CBALDELONAS	FEDEX	6/22/18	1346
Relinquished by:				
Received by: <u>[Signature]</u>	HONG NGUYEN	FPA	6/22/18	15:15

806428

SAMPLE CHAIN OF CUSTODY

ME 6/22/18 A05/VWS

Page # 2 of 2

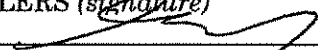
Send Report to Rob Roberts, cc: Jon Loeffler, Clare Tochilin

Company SoundEarth Strategies, Inc.

Address 2811 Fairview Avenue E, Suite 2000

City, State, ZIP Seattle, Washington 98102



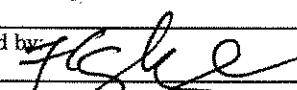
Phone # 206-306-1900 Fax # 206-306-1907

SAMPLERS (signature) 	
PROJECT NAME/NO. SKS SHELL / 0914-001	PO # 0914-001
REMARKS	

TURNAROUND TIME Standard (2 Weeks) RUSH Rush charges authorized by:
SAMPLE DISPOSAL Dispose after 30 days Return samples Will call with instructions

Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of Jars	ANALYSES REQUESTED				Notes
								NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	CVOCs by 8260C	
MW109-20180621			11A	6/21/18	1704	W	4	X	X	X		
MW107-20180622			12	6/22/18	1015	W	4	X	X	X		
RW03-20180622			13	↓	1105	W	4	X	X	X		
GRM												
												Samples received at 4 °C

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: 	Glen R. McKernan	SES	6/22/18	1346
Received by: 	CBALDELOMAR	FEDEX	6/22/18	1340
Relinquished by:				
Received by: 	HONG NGUYEN	FBI	6/22/18	15:15

**ATTACHMENT B
DATA VALIDATION REPORT**

Validata, LLC #806428

DATA VALIDATION REPORT

SKS SHELL Second Quarter 2018

Prepared for:

Sound Earth Strategies, Inc.
2811 Fairview Ave East, Suite 2000
Seattle, Washington 98102

Prepared by:

Validata, LLC
3346 NE 178th St.
Lake Forest Park, Washington 98155

PROJECT NARRATIVE

Data Validation

This report summarizes the results of the summary level validation (Stage 2A) performed on water samples for the SKS Shell sampling project. A complete list of samples is provided in the Sample Index. Samples were analyzed by Friedman & Bruya, Inc. laboratory, Seattle, Washington. The analytical methods are listed below:

Sample Index

ANALYSIS	METHOD	Reviewer
BTEX, TPH as Gasoline Range	SW8021B/NWTPH-Gx	C. Jensen
Total Petroleum Hydrocarbons – Diesel Range, Motor Oil	NWTPH-Dx	C. Jensen

The data were reviewed using guidance and quality control criteria documented in the analytical methods; *USEPA National Functional Guidelines for Organic Data Review* (EPA, 1999 & 2008).

The goal of data validation is to assign data assessment qualifiers for assistance in data interpretation. Results assigned as estimated (J or UJ), data may be used for site evaluation and risk assessment purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. For results assigned an R, the data are rejected and should not be used for site evaluation purposes. Unqualified data implies the data meet the data quality objectives as stated in the documents and methods referenced above. A summary of the data qualifiers used in validation are included in Appendix A. The summary of Qualified Data are provided in Appendix B. All validation worksheets are provided in Appendix C.

SAMPLE INDEX

SDG	Sample ID	Lab Sample ID	BTEX	NWTPH-Gx	NWTPH-Dx
806428	MW105-20180621	806428-0.3	X	X	X
	MW102-20180622	806428-12	X	X	X
	MW101-20180621	806428-06	X	X	X
	RW03-20180622	806428-13	X	X	X
	RW04-20180621	806428-07	X	X	X
	RW05-20180621	806428-09	X	X	X
	MW104-20180621	806428-10 1/1.4	X	X	X
	MW99-20180622	806428-04	X	X	X
	MW113-20180621	806428-02	X	X	X
	MW108-20180621	806428-08 1/1.8	X	X	X
	MW109-20180621	806428-11	X	X	X
	MW110-20180621	806428-05	X	X	X

DATA VALIDATION REPORT

Volatile Organic Compounds - Method SW8021B – Benzene, Toluene, Ethylbenzene, Xylenes

This report documents the review of analytical data from the analyses of water samples and the associated laboratory and field quality control (QC) samples. Friedman & Bruya, Inc. laboratory, Seattle, Washington. Refer to the Sample Index for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
806428	12	STAGE 2A

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables for a Stage 2A review. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

HARDCOPY VERIFICATION

Sample IDs and results reported in the data summary spreadsheet were verified (10% verification) by comparing the spreadsheet with the laboratory data package. Ten percent (10%) of the laboratory QC results were also verified.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

Sample Receipt, Preservation, and Holding Times	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)
Laboratory Blanks	Duplicates
Field Blanks	Target Analyte List
Surrogate Compounds	Reporting Limits
Laboratory Control Samples (LCS)	Reported Results

Sample Receipt, Preservation, and Holding Times

The validation guidance documents state that the cooler temperatures should be within an advisory temperature range of 0° to 6°C. For volatiles analysis, no action is taken if the cooler temperature is <10°C. If the cooler temperature is >10°C, associated sample results are estimated (J/UJ-1). With the exceptions noted below, the laboratory received the sample coolers within the advisory temperature range. The cooler temperatures were within the recommended temperature range at 4 °C.

Method and Field Blanks

The method blanks were all reported as undetected for target compounds.

Surrogate Compounds

Surrogates were added to all samples. All surrogate recoveries were within the laboratory control limits.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) samples were not specifically analyzed for this dataset. The laboratory demonstrated precision and accuracy through the analysis of laboratory control and laboratory control sample duplicate samples (LCS/LCSD) with acceptable results.

Field Duplicates

For water samples, the RPD control limit is 20% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the absolute difference between the sample and replicate must be less than 1x the RL.

SDG 806428: Sample pair MW99-20180622/RW03-20180622 were identified as a field duplicate pair. Field precision was acceptable as summarized below. Field data are not qualified for duplicate precision exceedance.

Sample ID	lab ID	analyte	806428-04	806428-13	RPD
MW99-20180622	806428-04	benzene	0	0	0%
RW03-20180622	806428-13	toluene	1.3	2.3	55% within 1 RL, acceptable
		ethyl benzene	30	31	3.3%
		xylenes	33	34	3%

Target Analyte List

A sampling plan was not available for review.

Reporting Limits

The laboratory reporting limits were sufficiently below the MTCA Method A cleanup levels provided in appendix B.

Reported Results

Reported results were considered acceptable.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. With the exceptions noted above, accuracy was acceptable as demonstrated by the surrogate, LCS recovery values. Precision was also acceptable as demonstrated by the LCS and field duplicate RPD values. All data are acceptable for use.

DATA VALIDATION REPORT

TPH as Gasoline Range Organics - Method NWTPH-Gx

This report documents the review of analytical data from the analyses of water samples and the associated laboratory and field quality control (QC) samples. Friedman & Bruya, Inc. laboratory, Seattle, Washington. Refer to the Sample Index for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
806428	12	STAGE 2A

DATA PACKAGE COMPLETENESS

With the exception noted below, the laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

HARDCOPY VERIFICATION

Sample IDs and results reported in the data summary spreadsheet were verified (10% verification) by comparing the spreadsheet the laboratory data package. Ten percent (10%) of the laboratory QC results were also verified.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

Sample Receipt, Preservation, and Holding Times	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)
Laboratory Blanks	Duplicates
Field Blanks	Target Analyte List
Surrogate Compounds	Reporting Limits
Laboratory Control Samples (LCS)	Reported Results

Sample Receipt, Preservation, and Holding Times

As stated in the validation guidance documents, sample shipping coolers should arrive at the laboratory within the advisory temperature range of 0°C-6°C and samples must be analyzed within 14 days. For volatiles analysis, no action is taken if the cooler temperature is <10°C. If the cooler temperature is >10°C, associated sample results are estimated (J/UJ-1). The cooler temperatures were within the recommended temperature range at 4 °C.

Method and Field Blanks

The method blanks were all reported as undetected for target compounds.

Surrogate Compounds

Surrogates were added to all samples. All surrogate recoveries were within the laboratory control limits.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) samples were not specifically analyzed for this dataset. The laboratory demonstrated precision and accuracy through the analysis of laboratory control and laboratory control duplicate samples (LCS/LCSD) with acceptable results.

Field Duplicates

For water samples, the RPD control limit is 20% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the absolute difference between the sample and replicate must be less than 1x the RL.

SDG 806428: Sample pair MW99-20180622/RW03-20180622 were identified as a field duplicate pair. Field precision was acceptable as summarized below. Field data are not qualified for duplicate precision exceedance.

Sample ID	lab ID	analyte	806428-13	806428-04	RPD
RW03-20180622	806428-13	GRO	730	630	14%
MW99-20180622	806428-04				

Target Analyte List

A sampling plan was not available for review.

Reporting Limits

The laboratory reporting limits were sufficiently below the MTCA Method A cleanup levels provided in appendix B.

Reported Results

Results reported were deemed acceptable.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. With the exceptions noted above, accuracy was acceptable as demonstrated by the surrogate and LCS recovery values. Precision was also acceptable as demonstrated by the LCS and laboratory and field duplicate RPD values. All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT

Diesel Range, Motor Oil - Method NWTPH-Dx

This report documents the review of analytical data from the analyses of water samples and the associated laboratory and field quality control (QC) samples. Friedman & Bruya, Inc. laboratory, Seattle, Washington. Refer to the Sample Index for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
806428	12	STAGE 2A

DATA PACKAGE COMPLETENESS

With the exception noted below, the laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative if applicable.

HARDCOPY VERIFICATION

Sample IDs and results reported in the data summary spreadsheet were verified (10% verification) by comparing the spreadsheet the laboratory data package. Ten percent (10%) of the laboratory QC results were also verified.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

Sample Receipt, Preservation, and Holding Times	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)
Laboratory Blanks	Duplicates
Field Blanks	Target Analyte List
Surrogate Compounds	Reporting Limits
Laboratory Control Samples (LCS)	Reported Results

Sample Preservation and Holding Times

As stated in validation guidance documents, sample shipping coolers should arrive at the laboratory within the advisory temperature range of 0°C - 6°C and be extracted within 7 days for aqueous samples and 14 days for soil samples. Sample extracts must be analyzed within 40 days of extraction. The holding times were met. The cooler temperature was 4 °C.

Method and Field Blanks

The method blanks were all reported as undetected for target compounds. Field blanks were not submitted with this sampling event.

Surrogate Compounds

Surrogates were added to all samples. All surrogate recoveries were within the laboratory control limits.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) samples were not specifically analyzed for this dataset. The laboratory demonstrated precision and accuracy through the analysis of laboratory control samples (LCS) and laboratory control sample duplicates (LCSD) with acceptable results.

Field Duplicates

For water samples, the RPD control limit is 20% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the absolute difference between the sample and replicate must be less than 1x the RL.

SDG 806428: Sample pair MW99-20180622/RW03-20180622 were identified as a field duplicate pair. Field precision was acceptable as summarized below. Field data are not qualified for duplicate precision exceedance.

Sample ID	lab ID	analyte	806428-04	806428-13	RPD
MW104-20180322	806428-04	Diesel Range	850	740	13.8%
MW99-20180322	806428-13	Motor Oil	0	0	0

Target Analyte List

A sampling plan was not available for review.

Reporting Limits

The laboratory reporting limits were sufficiently below the MTCA Method A cleanup levels provided in appendix B.

Reported Results

SDG 806428: Samples RW04-20180621, RW05-20180621, MW99-20180622, RW03-20180622, MW113-20180621, MW110-20180621, MW108-20180621 were qualified as estimated (J+) and reason code 2 since the laboratory reported the diesel range results as "x" indicating the chromatographic pattern does not match the standard.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by the surrogate and LCS/LCSD recovery values. Precision was also acceptable as demonstrated by the LCS/LCSD and laboratory and field duplicate relative percent difference values. The data were qualified due to sample versus fuel reference material not matching, as indicated by the laboratory. All data, as reported, are acceptable for use.

**APPENDIX A
DATA QUALIFIER DEFINITIONS
REASON CODES
AND CRITERIA TABLES**

DATA VALIDATION QUALIFIER CODES

Based on National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

NJ - The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents the approximate concentration.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

DATA QUALIFIER REASON CODES

Group	Code	Reason for Qualification
Sample Handling	1	Improper Sample Handling or Sample Preservation (i.e., headspace, cooler)
Instrument Performance	24	Instrument Performance (i.e., tune, resolution, retention time window, endrin breakdown, lock-mass)
Instrument Performance	5A	Initial Calibration (RF, %RSD, r2)
Instrument Performance	5B	Calibration Verification (CCV, CCAL; RF, %D, %R) Use bias flags (H,L)1 where appropriate
Instrument Performance	5C	Initial Calibration Verification (ICV %D, %R) Use bias flags (H,L)1 where appropriate
Blank Contamination	7	Field Blank Contamination (Equipment Rinsate, Trip Blank, etc.)
Blank Contamination	6	Lab Blank Contamination (i.e., method blank, instrument blank, etc.) Use low bias flag (L)1 for negative instrument blanks
Precision and Accuracy	8	Matrix Spike (MS and/or MSD) Recoveries Use bias flags (H,L)1 where appropriate
Precision and Accuracy	9	Precision (all replicates: LCS/LCSD, MS/MSD, Lab Replicate, Field Replicate)
Precision and Accuracy	10	Laboratory Control Sample Recoveries (a.k.a. Blank Spikes) Use bias flags (H,L)1 where appropriate
Precision and Accuracy	12	Reference Material Use bias flags (H,L)1 where appropriate
Precision and Accuracy	13	Surrogate Spike Recoveries (a.k.a. labeled compounds, recovery standards) Use bias flags (H,L)1 where appropriate
Interferences	16	ICP/ICP-MS Serial Dilution Percent Difference
Interferences	17	ICP/ICP-MS Interference Check Standard Recovery Use bias flags (H,L)1 where appropriate
Interferences	19	Internal Standard Performance (i.e., area, retention time, recovery)
Interferences	22	Elevated Detection Limit due to Interference (i.e., chemical and/or matrix)
Interferences	23	Bias from Matrix Interference (i.e. diphenyl ether, PCB/pesticides)
Identification and Quantitation	2	Chromatographic pattern in sample does not match pattern of calibration standard
Identification and Quantitation	3	2nd column confirmation (RPD or %D)
Identification and Quantitation	4	Tentatively Identified Compound (TIC) (associated with NJ only)
Identification and Quantitation	20	Calibration Range or Linear Range Exceeded
Identification and Quantitation	25	Compound Identification (i.e., ion ratio, retention time, relative abundance, etc.)
Miscellaneous	11	A more appropriate result is reported (multiple reported analyses i.e., dilutions, reextractions, etc. Associated with "R" and "DNR" only)
Miscellaneous	14	Other (See DV report for details)
Miscellaneous	26	Method QC information not provided

DATA VALIDATION CRITERIA

Volatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on NFG 1999 & 2008 and SW-846 Method 8260, analyzed by SW8021B)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Blanks					
Method Blank (MB)	MB: One per matrix per batch (of ≤ 20 sample) No TICs present	NFG (2) Method (3)	U (pos) if result is < 5X or 10X action level R (pos) TICs using 10X rule	7	10X action level for methylene chloride, acetone, & 2-butanone. 5X for all other target analytes Hierarchy of blank review: #1 - Review MB, qualify as needed #2 - Review TB, qualify as needed #3 - Review FB, qualify as needed Note: Actions as per NFG 1999
Trip Blank (TB)	No detected compounds > MDL	NFG (2) Method (3)	U (pos) if result is < 5X or 10X action level	6	
Field Blank (FB)	No detected compounds > MDL	NFG (2) Method (3)	U (pos) if result is < 5X or 10X action level	6	
Precision and Accuracy					
LCS/LCSD (recovery)	One per matrix per batch (of ≤ 20 samples)	Method (3)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND) %R < 10%	10 (H,L)4	No action if only one spike %R is outside criteria when LCSD is analyzed, unless one recovery is <10%. QAPP may have overriding accuracy limits.
LCS/LCSD RPD	If LCSD analyzed RPD < lab limits	Method (3)	J (pos)	9	Qualify all associated samples. QAPP may have overriding precision limits.
Reference Material (RM, SRM, or CRM)	Result ±20% of the 95% confidence interval of the true value for analytes	Standard review	J (pos)/UJ (ND) if < LCL J (pos) if > UCL	12 (H,L)4	QAPP may have overriding accuracy limits. Some manufacturers may have different RM control limits
Surrogates	Added to all samples Within method/laboratory control limits	NFG (1) Method (3)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND) if < 10%	13 (H,L)4	No action if there are 4+ surrogates and only 1 outlier. Qualify all compounds if qualification is required.
Internal Standards	Added to all samples Acceptable Range: IS area 50% to 200% of CCAL area RT within 30 seconds of CC RT	NFG (1) Method (3)	J (pos) if > 200% J (pos)/UJ (ND) if < 50% J (pos)/R (ND) if < 25% if RT > 30 seconds use PJ	19	Qualify compounds quantified using particular internal standard
MS/MSD (recovery)	One per matrix per batch (of ≤ 20 samples) Use method acceptance criteria/laboratory limits	NFG (1) Method (3)	J (pos) %R > UCL J (pos)/UJ (ND) if both %R < LCL J (pos)/R (ND) if both %R < 10% J (pos)/UJ (ND) if one > UCL & one < LCL, with no bias	8 (H,L)4	No action if only one spike %R is outside criteria. No action if parent concentration is >4x the amount spiked. Qualify parent sample only.
MS/MSD (RPD)	One per matrix per batch (of ≤ 20 samples) Use method acceptance criteria/laboratory limits	NFG (1) Method (3)	J (pos) If RPD > control limit	9	Qualify parent sample only
Field Duplicates	Solids: RPD < 50% OR difference < 2X RL (for results < 5X RL) Aqueous: RPD < 35%	Standard review	J (pos)/UJ (ND) Qualify only parent and field duplicate samples	9	Use project limits if specified

	OR difference < 1X RL (for results < 5X RL)				
Compound Identification and Quantitation					
Retention Time Relative Ion Intensities	RRT within 0.06 of standard RRT Ion relative intensity within 20% of standard All ions in std. at > 10% intensity must be present in sample	NFG (1) Method (3)	U (pos) if identification criteria not met	25	
TICs	Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification	NFG (1) Method (3)	NJ TIC R (pos) if common laboratory contaminants	4	Common laboratory contaminants: aldol condensation products, solvent preservatives, and reagent contaminants
Calibration Range	Results greater than highest calibration standard	Standard review	Qualify J (pos)	20	If result from dilution analysis is not reported.
Dilutions, Reextractions and/or Reanalyses	Report only one result per analyte	Standard review	Report best result	11	Best value reported

1 National Functional Guidelines for Organic Data Review, June, 2008 (pos): Positive Result
2 National Functional Guidelines for Organic Data Review, Oct, 1999 (ND): Non-detect
3 Method SW846 8260C Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)
4 NFG 2013 suggests using "+ / -" to indicate bias; validation uses "H" = high bias indicated; "L" = low bias indicated.

DATA VALIDATION CRITERIA

Validation Guidelines for Total Petroleum Hydrocarbons-Gasoline Range
(Based on EPA National Functional Guidelines as applied to criteria in NWTPH-Gx,
June 1997, Wa DOE & Oregon DEQ)

QC Element	Acceptance Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling				
Cooler Temperature & Preservation	4°C±2°C Water: HCl to pH < 2	J(+)/UJ(-) if greater than 6°C	1	
Holding Time	Waters: 14 days preserved 7 days unpreserved Solids: 14 Days	J(+)/UJ(-) if hold times exceeded J(+)/R(-) if exceeded > 3X	1	Professional Judgement
Instrument Performance				
Initial Calibration	5 calibration points (All within 15% of true value) Linear Regression: r2 ≥0.990 If used, RSD of response factors ≤20%	Narrate if fewer than 5 calibration levels or if %R >15% J(+)/UJ(-) if r2 <0.990 J(+)/UJ(-) if %RSD > 20% 5A Mid-range Calibration Check Std. Analyzed before and after each analysis shift & every 20 samples. Recovery range 80% to 120%	5A	
Mid-range Calibration Check Std.	Analyzed before and after each analysis shift & every 20 samples. Recovery range 80% to 120%	Narrate if frequency not met. J(+)/UJ(-) if %R < 80% J(+) if %R >120%	5B	
Blank Contamination				
Method Blank	At least one per batch (≤10 samples)	U (at the RL) if sample result is < RL & < 5X blank result. U (at reported sample value) if sample result is ≥ RL and < 5X blank result	7	
Trip Blank (if required by project)	No results >RL	Action is same as method blank for positive results remaining in trip blank after method blank qualifiers are assigned.	18	
Field Blanks (if required by project)	No results >RL	remaining in field blank after method and trip blank qualifiers are assigned.	6	
Precision and Accuracy				
MS samples (accuracy) (if required by project)	%R within lab control limits	Qualify parent only, unless other QC indicates systematic problems. J(+) if both %R > upper control limit (UCL) J(+)/UJ(-) if both %R < lower control limit (LCL) No action if parent conc. >5X the amount spiked.	8	Use Professional Judgement if only one %R outlier
Precision: MS/MSD or LCS/LCSD or sample/dup	At least one set per batch (≤10 samples) RPD ≤ lab control limit	J(+) if RPD > lab control limits	9	
LCS (not required by method)	%R within lab control limits	J(+)/UJ(-) if %R < LCL J(+) if %R > UCL J(+)/R(-) if any %R <10%	10	Professional Judgement
Surrogates	1,4-difluorobenzene added to all samples (inc. QC samples). %R = 50-150%	J(+)/UJ(-) if %R < LCL J(+) if %R >UCL J(+)/R(-) if any %R <10% No action if 2 or more surrogates are used, and only one is outside control limits.	13	Professional Judgement
Pattern Identification	Compare sample chromatogram to standard chromatogram to ensure range and pattern are reasonable match. Laboratory may flag results which have poor match.	J(+)	2	
Field Duplicates	Use project control limits, if stated in QAPP default: water: RPD < 35% solids: RPD < 50%	Narrate outliers If required by project, qualify with J(+)/UJ(-)	9	
Compound ID and Calculation				
Two analyses for one sample (e.g., dilution)	Report only one result per analyte	best value chosen	11	

DATA VALIDATION CRITERIA

**Validation Guidelines for Total Petroleum Hydrocarbons-Diesel & Residual Range
(Based on EPA National Functional Guidelines as applied to criteria in NWTPH-Dx,
June 1997, Wa DOE & Oregon DEQ)**

QC Element	Acceptance Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling				
Cooler Temperature & Preservation	4°C±2°C Water: HCl to pH < 2	J(+)/UJ(-) if greater than 6 deg. C	1	
Holding Time	Ext. Waters: 14 days preserved 7 days unpreserved Ext. Solids: 14 Days Analysis: 40 days from extraction	J(+)/UJ(-) if hold times exceeded J(+)/R(-) if exceeded > 3X	1	Professional Judgement
Instrument Performance				
Initial Calibration	5 calibration points (All within 15% of true value) Linear Regression: r ² ≥0.990 If used, RSD of response factors ≤20%	Narrate if fewer than 5 calibration levels or if %R >15% J(+)/UJ(-) if r ² < 0.990 J(+)/UJ(-) if %RSD > 20%	5A	
Mid-range Calibration Check Std.	Analyzed before and after each analysis shift & every 20 samples. Recovery range 85% to 115%	Narrate if frequency not met. J(+)/UJ(-) if %R < 85% J(+) if %R >115%	5B	
Blank Contamination				
Method Blank	At least one per batch (≤20 samples) Method Blank No results >R	U (at the RL) if sample result is < RL & < 5X blank result. 7 U (at reported sample value) if sample result is ≥ RL and < 5X blank result	7	
Field Blanks (if required by project)	No results > RL	Action is same as method blank for positive results remaining in the field blank after method blank qualifiers are assigned.	6	
Precision and Accuracy				
MS samples (accuracy) (if required by project)	%R within lab control limits	Qualify parent only, unless other QC indicates systematic problems. J(+) if both %R > upper control limit (UCL) J(+)/UJ(-) if both %R < lower control limit (LCL) No action if parent conc. >5X the amount spiked.	8	Use Professional Judgement if only one %R outlier
Precision: MS/MSD or LCS/LCSD or sample/dup	At least one set per batch (≤10 samples) RPD ≤ lab control limit	J(+) if RPD > lab control limits	9	
LCS (not required by method)	%R within lab control limits	J(+)/UJ(-) if %R < LCL J(+) if %R > UCL J(+)/R(-) if any %R <10%	10	Professional Judgement
Surrogates	2-fluorobiphenyl, p-terphenyl, o-terphenyl, and/or pentacosane added to all samples (inc. QC samples). %R = 50-150%	J(+)/UJ(-) if %R < LCL J(+) if %R > UCL J(+)/R(-) if any %R <10% No action if 2 or more surrogates are used, and only one is outside control limits	13	Professional Judgement
Pattern Identification	Compare sample chromatogram to standard chromatogram to ensure range and pattern are reasonable match. Laboratory may flag results which have poor match.	J(+)	2	
Field Duplicates	Use project control limits, if stated in QAPP default: water: RPD < 35% solids: RPD < 50%	Narrate (Use Professional Judgement to qualify)	9	
Compound ID and Calculation				
Two analyses for one sample (dilution)	Report only one result per analyte	all results that should not be reported.	11	

APPENDIX B
QUALIFIED DATA SUMMARY TABLE

ID	Sample Date	GRPH ⁽²⁾	Benzene ⁽³⁾	Toluene ⁽³⁾	Ethyl-benzene ⁽³⁾	Total Xylenes ⁽³⁾	DRPH ⁽²⁾	validation qualifier	ORPH ⁽²⁾
									<250
MW101	6/21/18	<100	<1	<1	<1	<3	<50		
MW102	6/22/18	<100	<1	<1	<1	<3	<50		<250
MW103	6/21/18	<100	<1	<1	<1	<3	<80		<400
MW104	6/21/18	130	<1	<1	<1	<3	720		<350
MW105	6/21/18	140	<1	1.4	1.4	<3	180x	J+ 2	<250
RW03	6/22/18	730	<1	2.3	31	34	740x	J+ 2	<250
RW04	6/21/18	360	<1	2.6	4.8	4.5	400x	J+ 2	<250
RW05	6/21/18	180	<1	<1	1.4	<3	140x	J+ 2	<260
MW108	6/21/18	<100	<1	<1	<1	<3	150x	J+ 2	<450
MW109	6/21/18	190	<1	1.2	<1	<3	200		<250
MW99	6/22/18	670	<1	1.3	30	33	850x	J+ 2	<250
MW113	6/21/18	<100	<1	<1	<1	<3	71x	J+ 2	<250
MW110	6/21/18	<100	<1	<1	<1	<3	96x	J+ 2	<250
MTCA GW criteria		1,000/800⁽⁶⁾	5	1,000	700	1,000	500		500

Red indicates concentrations exceeding MTCA Method A cleanup levels for groundwater.

Samples analyzed by Friedman & Bruya, Inc. of Seattle, Washington.

⁽²⁾Analyzed by Method NWTPH-Gx (gasoline) and NWTPH-Dx (diesel and oil).

⁽³⁾Analyzed by EPA Method 8260B or 8260C.

⁽⁴⁾Analyzed by Method NWTPH-Dx; sample extracts passed through a silica gel column prior to analysis.

⁽⁵⁾MTCA Cleanup Regulation, Method A Cleanup Levels, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, revised November 2007.

⁽⁶⁾1,000 µg/L when benzene is not present and 800 µg/L when benzene is present.

Laboratory Note:

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

Validation qualifiers

J+ numerical value is the approximate concentration

Validation Codes

2 Chromatographic pattern in sample does not match pattern of calibration standard

DRPH = diesel-range petroleum hydrocarbons

EPA = U.S. Environmental Protection Agency

GRPH = gasoline-range petroleum hydrocarbons

MTCA = Washington State Model Toxics Control Act

NWTPH = Northwest Total Petroleum Hydrocarbon

ORPH = oil-range petroleum hydrocarbons

SoundEarth = SoundEarth Strategies, Inc.

APPENDIX C
DATA VALIDATION CHECKLISTS

VALIDATION WORKSHEET

SDG: 806428
 Reviewer: C Jensen

Method: Diesel f W.O NWTPT - DX

Date Reviewed: 7.2.18

Sample Collection Dates: 6.21, 6.22.18

The following data validation areas were reviewed:

Sample Identification	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Validation Criteria	mw113.20180621	mw105	mw99.20180622	mw110.0621	mw101	mw104	mw108	mw05	mw104	mw109	mw102.0622	mw03.0622								
Sample results	A																			
Holding Times	A																			
Completion	A																			
Method Blanks	A																			
LCS / LCS/D duplicate RPD	A																			
MS/MSD:																				

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

Comments: 492 ~~mw105~~ ~~mw99~~

gm 6.21.18 6.22.18
 prep 6.25.18
 run 6.25.18

lab x flag: Diesel mw113 J+2
 pattern
 chromatogram does not
 resemble fuel standard
 used for quantitation
 mw04
 mw108
 mw05
 mw03

VALIDATION WORKSHEET

Method: BTX/GA/GC/MS/MSD / MWDHGX

SDG: 806428
Reviewer: C Jensen

Date Reviewed: 7.2.18

Sample Collection Dates: _____

The following data validation areas were reviewed:

Sample Identification	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Validation Criteria	MW117. 20180621	MW105. d	MW99. 20180622	MW110. 20180621	MW101.	MW004.	MW005	MW005	MW104	MW109	MW102. 20180622	MW007. 20180622									
Sample results	A																				
Holding Times	A																				
Completion	A																				
Method Blanks	A																				
LCS duplicate RPD	A																				
MS/MSD:	A																				

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

Comments:

Spl 6.21.18 6.22.18 MW 99 / RW03

REP 6.25.18

MW 6.25.18

BT EX G

Surv. dr. MW99 < 1.3 30 33 630

RW03 < 1 2.3 31 34 730

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/28/18
 Date Received: 06/22/18
 Project: SOU_0914-001_20180622, F&BI 806428
 Date Extracted: 06/25/18
 Date Analyzed: 06/25/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
 FOR TOTAL PETROLEUM HYDROCARBONS AS
 DIESEL AND MOTOR OIL
 USING METHOD NWTPH-Dx**
 Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 41-152)
MW113-20180621 806428-02	71 x J+ 2	<250	98
MW105-20180621 806428-03	<50	<250	94
MW99-20180622 806428-04	850 x J+ 2	<250	95
MW110-20180621 806428-05	96 x J+ 2	<250	92
MW101-20180621 806428-06	<50	<250	93
RW04-20180621 806428-07	400 x J+ 2	<250	97
MW108-20180621 806428-08 1/1.8	150 x J+ 2	<450	90
RW05-20180621 806428-09	180 x J+ 2	<250	88
MW104-20180621 806428-10 1/1.4	720	<350	93
MW109-20180621 806428-11	200	<250	95
MW102-20180622 806428-12	<50	<250	101
RW03-20180622 806428-13	740 x J+ 2	<250	86
Method Blank 08-1372 MB	<50	<250	94

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/28/18
 Date Received: 06/22/18
 Project: SOU_0914-001_20180622, F&BI 806428
 Date Extracted: 06/25/18
 Date Analyzed: 06/25/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
 FOR BENZENE, TOLUENE, ETHYLBENZENE,
 XYLENES AND TPH AS GASOLINE
 USING METHODS 8021B AND NWTPH-Gx**
 Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
MW113-20180621 806428-02	<1	<1	<1	<3	<100	68
MW105-20180621 806428-03	<1	<1	<1	<3	<100	68
MW99-20180622 806428-04	<1	1.3	30	33	670	77
MW110-20180621 806428-05	<1	<1	<1	<3	<100	68
MW101-20180621 806428-06	<1	<1	<1	<3	<100	68
RW04-20180621 806428-07	<1	2.6	4.8	4.5	360	74
MW108-20180621 806428-08	<1	<1	<1	<3	<100	68
RW05-20180621 806428-09	<1	1.4	1.4	<3	140	69
MW104-20180621 806428-10	<1	<1	<1	<3	130	69
MW109-20180621 806428-11	<1	1.2	<1	<3	190	68
MW102-20180622 806428-12	<1	<1	<1	<3	<100	68

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 06/28/18
Date Received: 06/22/18
Project: SOU_0914-001_20180622, F&BI 806428
Date Extracted: 06/25/18
Date Analyzed: 06/25/18

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR BENZENE, TOLUENE, ETHYLBENZENE,
XYLENES AND TPH AS GASOLINE
USING METHODS 8021B AND NWTPH-Gx**
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
RW03-20180622 806428-13	<1	2.3	31	34	730	77
Method Blank 08-1282 MB	<1	<1	<1	<3	<100	71

80642# 806428

SAMPLE CHAIN OF CUSTODY

ME 6/22/18 A05/VW42

Send Report to: Rob Roberts, cc: Jon Loeffler, Clare Tochilin

Company SoundEarth Strategies, Inc.

Address 2811 Fairview Avenue E, Suite 2000

City, State, ZIP Seattle, Washington 98102

Phone # 206-306-1900 Fax # 206-306-1907

SAMPLERS (signature) *[Signature]*

PROJECT NAME/NO.

SKS SHELL / 0914-001

PO #

0914-001

REMARKS

TURNAROUND TIME

Standard (2 Weeks)

RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

Dispose after 30 days

Return samples

Will call with instructions

Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of Jars	ANALYSES REQUESTED				Notes	
								NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	CVOCs by 8280C		
MW103-20180621			01	6/21/18	1200	W	4						HOLD
MW113-20180621			02	↓	1239	W	4	X	X	X			
MW105-20180621			03	↓	1332	W	4	X	X	X			
MW99-20180622			04	6/22/18	1300	W	4	X	X	X			
MW110-20180621			05	6/21/18	1438	W	4	X	X	X			
MW101-20180621			06		1445	W	4	X	X	X			
RW04-20180621			07		1540	W	4	X	X	X			
MW108-20180621			08	↓	1608	W	4	X	X	X			Samples received at 4 ⁰⁰
RW05-20180621			09	↓	1640	W	4	X	X	X			
MW104-20180621			10	↓	1700	W	4	X	X	X			

Friedman & Bruya, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COC\COC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <i>[Signature]</i>	Glenn R. McKenney	SES	6/22/18	1346
Received by: <i>[Signature]</i>	CBM DELORD	FEDEX	6/22/18	1346
Relinquished by:				
Received by: <i>[Signature]</i>	HONG DEWUEN	FRP	6/22/18	15:15

806428

SAMPLE CHAIN OF CUSTODY ME 6/22/18 'A05/RWS Page # 2 of 2

Send Report to Rob Roberts, cc: Jon Loeffler, Clare Tochilin
 Company SoundEarth Strategies, Inc.
 Address 2811 Fairview Avenue E, Suite 2000
 City, State, ZIP Seattle, Washington 98102
 Phone # 206-306-1900 Fax # 206-306-1907

SAMPLERS (signature) _____
 PROJECT NAME/NO. SKS SHELL / 0914-001 PO # 0914-001
 REMARKS

TURNAROUND TIME
 Standard (2 Weeks)
 RUSH
 Rush charges authorized by: _____
 SAMPLE DISPOSAL
 Dispose after 30 days
 Return samples
 Will call with instructions

Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of Jars	ANALYSES REQUESTED				Notes
								NWTPH-DX	NWTPH-Gx	BTEX by 8021B	CVOCs by 8260C	
MW109-20180621			11A	6/21/18	1704	W	4	X	X	X		
MW102-20180622			12	6/22/18	1615	W	4	X	X	X		
RW03-20180622			13	↓	1105	W	4	X	X	X		
GRM												
												Samples received at 4:00

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Glenn R. McKenney	SES	6/22/18	1346
Received by:	C BALDELOMAR	FEDEX	6/22/18	1340
Relinquished by:				
Received by:	HONG NGUYEN	FBI	6/22/18	15:15