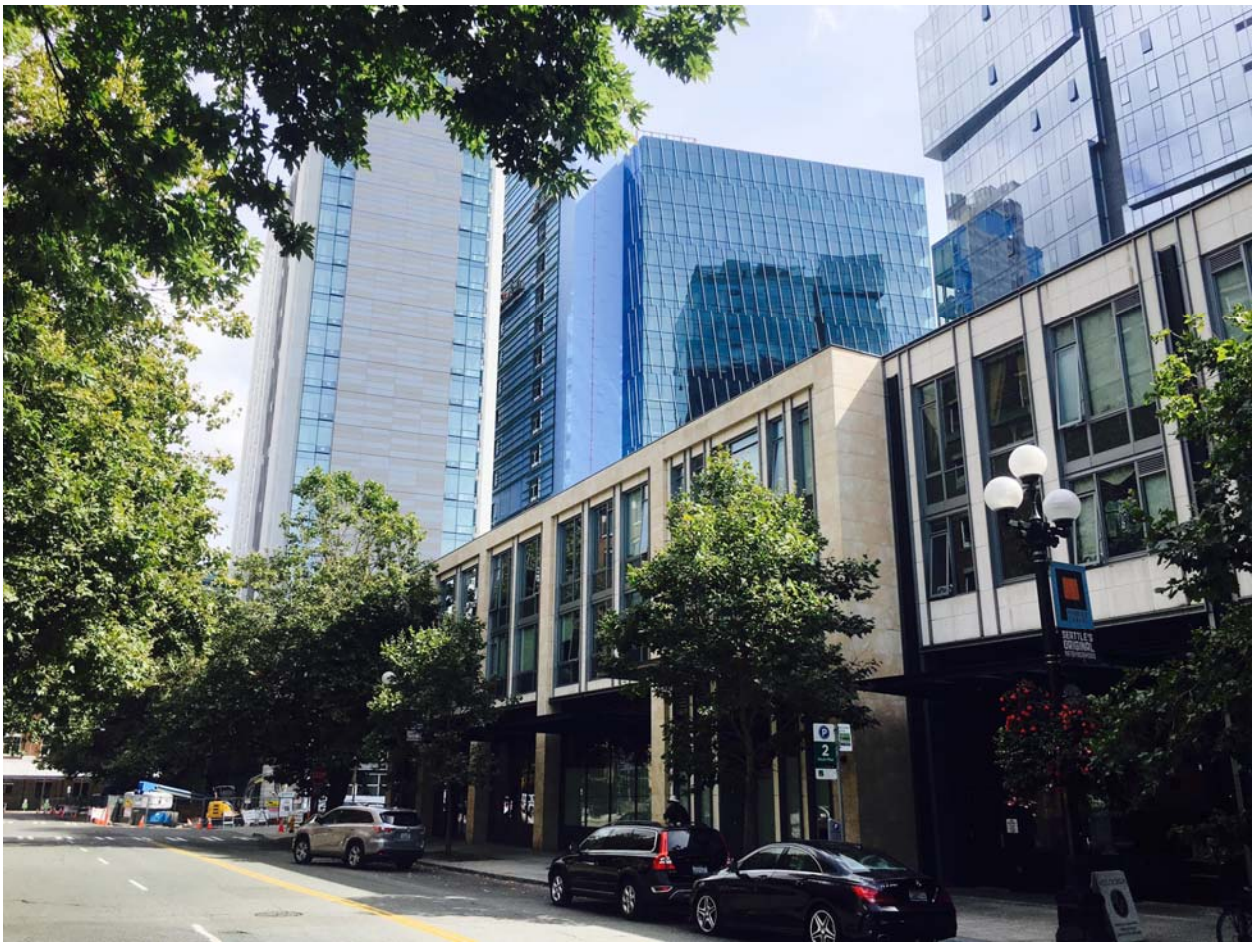
ROTHMAN & ASSOCIATES

Groundwater Monitoring Report

First Quarter 2018



Property:

North Lot Property
255 South King Street
Seattle, Washington

Prepared for:

255 S King Street LP
270 South Hanford Street, Suite 100
Seattle, Washington

February 28, 2018

ROTHMAN
&ASSOCIATES

Groundwater Monitoring Report

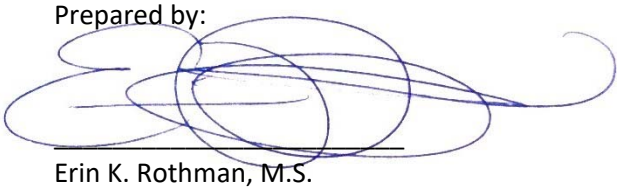
First Quarter 2018

North Lot Property
Washington State Department of Ecology Facility ID 5378137
255 South King Street
Seattle, Washington

Prepared for:

255 S King Street LP
270 South Hanford Street, Suite 100
Seattle, Washington

Prepared by:



Erin K. Rothman, M.S.
Managing Principal

Rothman & Associates
505 Broadway East, Ste 115
Seattle, Washington

February 28, 2018

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1.0 INTRODUCTION

Rothman & Associates has prepared this First Quarter 2018 Groundwater Monitoring Report for the North Lot Property, located at 201 and 255 South King Street in Seattle, Washington (the Site), on behalf of 255 S. King Street LP to demonstrate compliance with the specific requirements of the cleanup action completed at the North Lot Property as part of a Prospective Purchaser Consent Decree.

2.0 BACKGROUND

This section provides a description of the Site features and location, a summary of historical land use, and a description of the local geology and hydrogeology of the Site and adjoining parcels.

2.1 Property Location and Description

The Site, which is located at 201 and 255 South King Street in the Pioneer Square neighborhood of Seattle, Washington, includes two rectangularly-shaped tax parcels (King County Parcel Nos. 766620-4878 and 795300-0000) that cover approximately 168,573 square feet (3.87 acres) of land.

The location of the Site is shown on Figure 1. Figure 2 depicts a plan view/layout of the Site and locations of the compliance monitoring wells.

2.2 Land Use History of the Site

Based on a review of historical records and the findings of the Remedial Investigation (RI) completed by Landau Associates in 2011, the Site was originally undeveloped tide flats of Elliott Bay. The Site was filled in the late 1890s and early 1900s and operated as a rail yard from the late 1800s until the late 1960s. The fill material underlying the Site is composed of remnants of the former rail yard operations and construction debris (i.e., brick, metal, and concrete). Prior to filling, the Site was initially developed with streets, buildings, and railroad tracks elevated on and supported by pilings. Several sets of railroad tracks were formerly present on the Site. Structures associated with the rail yard included engine maintenance buildings, sand houses, coal houses, oil houses, and materials storage areas. King County purchased the Site in the 1970s to facilitate construction of the Kingdome stadium to the south of the Site, which was later demolished and replaced with the current CenturyLink Field and Event Center development. The Site was used as a parking lot since the 1970s. 255 S. King Street LP purchased the Property from NLD in August 2013 and redeveloped it with a high-rise hotel, residential, and commercial/retail buildings with belowground parking in 2014 and 2017. Construction of the hotel was completed in February 2018.

2.3 Regional Hydrogeology

The geology of the region is generally characterized by a thick sequence of glacial soil overlying tertiary bedrock, with local areas of exposed surficial bedrock. In general, the glacial stratigraphic sequence of the Puget Lowland consists of generally fine-grained, low-energy, non- glacial and glacial lacustrine and fluvial deposits overlain by glacial advance sand. The advance sand is overlain by glacial till, which, in turn is locally overlain by glacial recessional sand, where present, as well as organic-rich peat, lacustrine, and alluvial deposits. Where exposed, the glacial soil has been modified by mass wasting, stream erosion and deposition, and anthropogenic modifications (Booth et al. 2009).

The hydrogeology of the Puget lowland and Quaternary glacial soil includes near-surface, non-glacial alluvial deposits, perched water-bearing zones atop and within the glacial till soil or other consolidated fine-grained or cemented glacial deposits, and more persistent and higher yielding water-bearing zones present within the underlying glacial advance sands and older granular glacial and non-glacial deposits. The advance sands can be an important source of potable water supplies, particularly in suburban and rural locations within the Puget Lowland, while the water-bearing zones within the glacial till are not often exploited as a potable source as a result of significant seasonal fluctuations, low yield, and susceptibility to water quality degradation (Booth et al. 2009).

3.0 GROUNDWATER MONITORING EVENT

The groundwater monitoring event was conducted on February 8, 2018, and included the sampling of six monitoring wells: MW-16D, MW-18D, MW-19, MW-20, MW-21, and MW-22.

3.1 Depth to Groundwater

Prior to sampling, on February 8, 2018, the wells were opened and allowed to equilibrate to atmospheric pressure. Depth to water in the wells was measured using an electronic interface probe and ranged from 5.27 feet (MW-22) and 10.64 feet (MW-18D) below the top of the well casings (Table 1).

3.2 Groundwater Sampling

All six of the monitoring wells were sampled using a peristaltic pump and single-use polyethylene tubing using low-flow sampling techniques in accordance with *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells* (U.S. EPA 2017). Samples were collected directly from the sampling equipment and stored on ice in a cooler. Groundwater samples collected from monitoring wells were designated with the well number (e.g., MW-19) and date, and the samples were logged on a chain-of-custody form and submitted to Friedman & Bruya, Inc. in Seattle, Washington, following proper chain-of-custody protocols.

Groundwater samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by U.S. Environmental Protection Agency (EPA) Method 8021; gasoline-range total petroleum hydrocarbons (GRPH) and diesel-range total petroleum hydrocarbons (DRPH) by Northwest Total Petroleum Hydrocarbon (NWTPH) Method NWTPH-Gx and NWTPH-Dx; low-level polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270D SIM; and dissolved metals (arsenic, cadmium, chromium, lead, mercury, copper, and zinc) by EPA Method 200.8 or EPA Method 7471 (mercury). Groundwater samples collected for analysis of dissolved metals were field-filtered using a 0.45-micron membrane filter.

A blind duplicate sample was collected for quality control purposes.

3.3 Results

The following subsections summarize the results of the First Quarter 2018 groundwater monitoring event.

3.3.1 Groundwater Elevation and Flow Direction

Groundwater elevations ranged from 6.53 feet (MW-18D) to 11.87 feet (MW-22) above mean sea level. The local groundwater gradient and flow patterns across the Property are variable, which is common

within shallow, unconfined aquifers that consist of fill material, especially in urban areas where subgrade constructed features can affect the immediately surrounding groundwater table.

In general, there is a localized area of relatively lower groundwater elevations (i.e., groundwater low) roughly between the corner of South King Street and King Street Station to the east, and an area of relatively higher groundwater elevations (i.e., groundwater high) surrounding monitoring well MW-19 near the central portion of the Property. This is consistent with prior evaluations of groundwater flow and gradient (Landau 2011).

3.3.2 Groundwater Sample Results

Using the Site-specific cleanup levels as a comparison, only two of the groundwater samples contained concentrations of any of the analytes in excess of their respective cleanup levels.

- ORPH, GRPH, benzene, ethylbenzene, and total xylenes were not detected in any of the samples submitted for analysis.

- Arsenic was detected in groundwater collected from MW-18D, MW-19, MW-21, and MW-22; none of the arsenic concentrations exceeded the cleanup levels. The concentrations of arsenic in groundwater near the western portion of the Property were below 5 micrograms per liter (µg/L), and the concentrations of arsenic in groundwater near the eastern portion of the Property were below 21.3 µg/L.

- DRPH was detected in groundwater collected from MW-22 at a concentration above the cleanup level established for the Property.

- Concentrations of cPAHs were detected in groundwater collected from monitoring well MW-19 at a TEF that exceeds the cleanup level of 0.012 µg/L. Using the method discussed below, the TEF for this sample is 0.0287 µg/L.

- With the exception of groundwater collected from MW-19, PAHs were not detected in any of the samples collected. However, by virtue of the toxicity equivalency calculations, and using one-half the detection limit for calculations that include non-detectable concentrations, the combined totals for each of the PAHs appear to exceed the cleanup level using EPA Method 8270 SIM, in accordance with the Compliance Monitoring Plan (Landau 2013).

4.0 CONCLUSIONS

The results of the First Quarter 2018 groundwater monitoring event indicate that, with the exception of a slight exceedance of DRPH in MW-22 and a TEF for cPAHs that exceeds the cleanup level in groundwater collected from MW-19, the groundwater quality at the point of compliance for the North Lot Property meets the requirements set forth in the Consent Decree.

The Second Quarter 2018 monitoring event will be conducted in May 2018, and the results will be submitted to Ecology for review and approval in a quarterly groundwater monitoring report.

5.0 LIMITATIONS

The findings and conclusions documented in this report have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area. No warranty, express or implied, is made regarding the information and recommendations provided in this report.

6.0 REFERENCES

Booth, Troost, Goetz, and Schimel. 2009. Geologic map of northeastern Seattle (part of the Seattle North 7.5' x 15' quadrangle), King County, Washington: U.S. Geological Survey Scientific Investigations Map 3065, scale 1:12000 and database.

Landau Associates. 2011a. Remedial Investigation Report, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. May 23.

Landau Associates. 2011b. Feasibility Study Report, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. May 23.

Landau Associates. 2011c. Cleanup Action Plan, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. July 1.

Landau Associates. 2011d. Engineering Design Report, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. July 5.

Landau Associates. 2012. Feasibility Study Addendum, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. September 27.

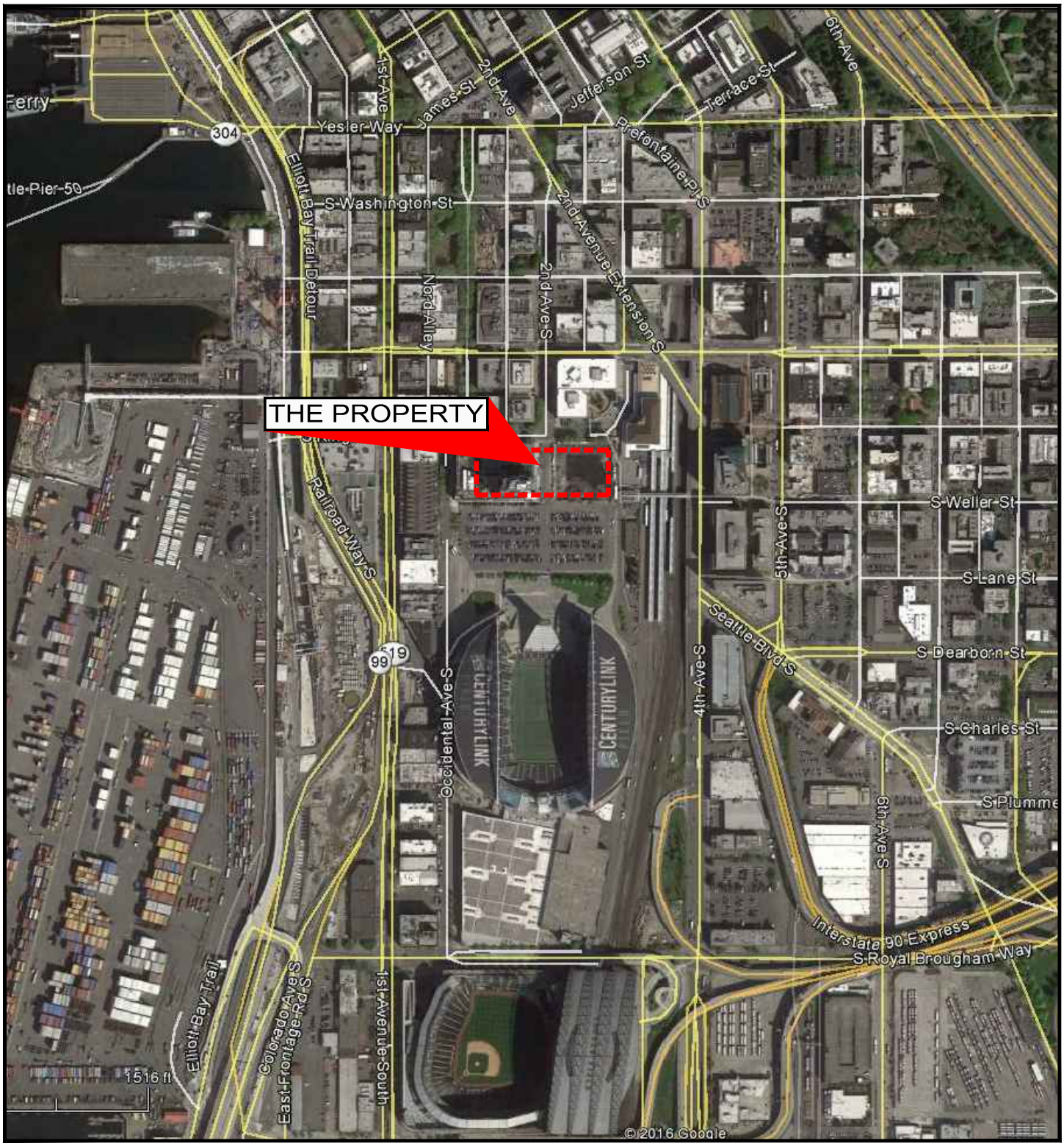
Landau Associates. 2013. Cleanup Action Plan Addendum, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. September 18.

Landau Associates. 2014. Engineering Design Report Addendum, North Lot Development, Seattle, Washington. Prepared for North Lot Development, LLC. February 28.

United States Environmental Protection Agency. 2017. Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells. EQASOP-GW4 Region 1 Low-Stress (Low-Flow) SOP, Revision Number 4. September 19.

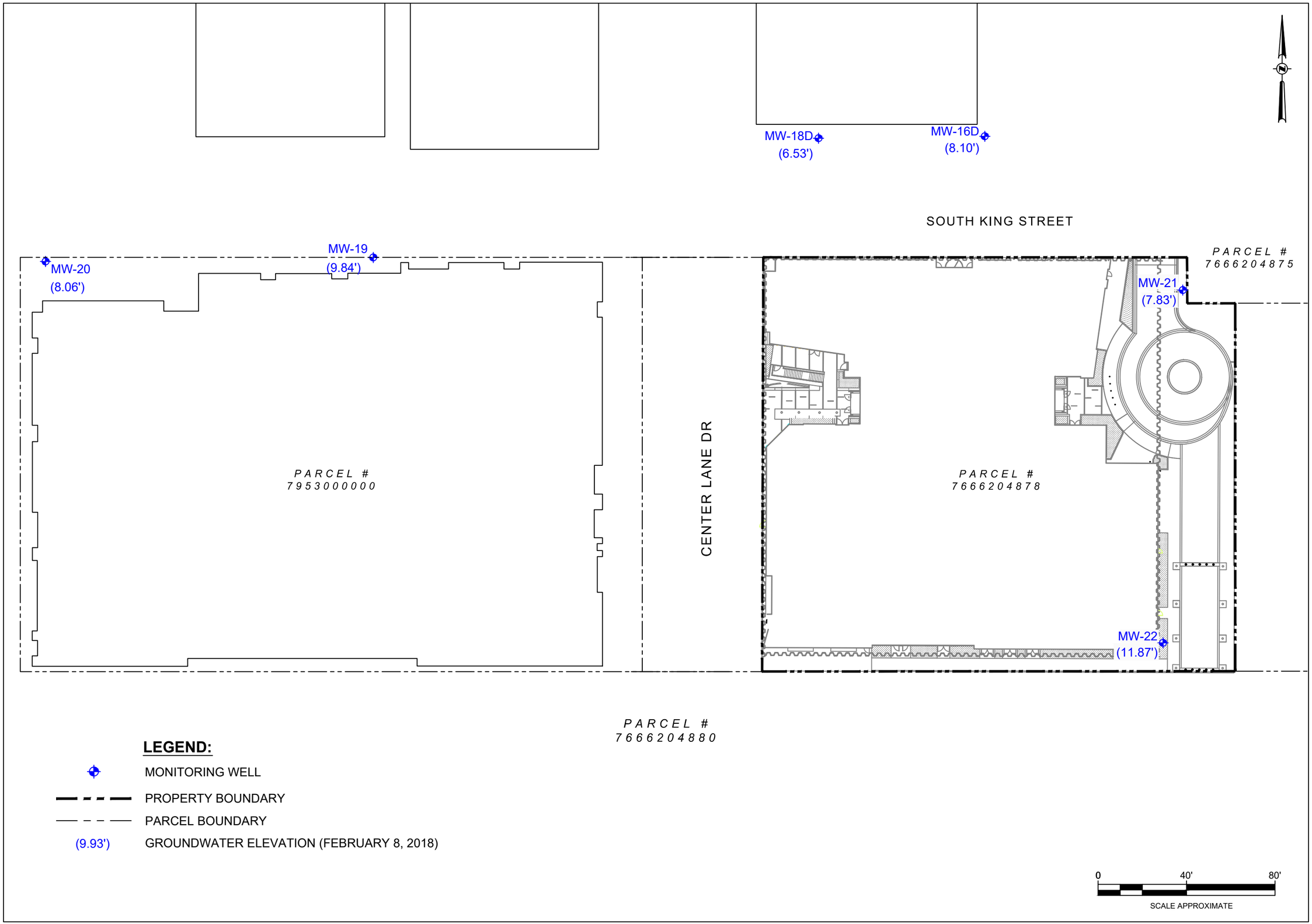
Washington Department of Ecology. 2014. Table D-1 of the Consent Decree, Cleanup Action Schedule, North Lot Property, Seattle, Washington. January 14.

FIGURES



Reference: Google Earth

ROTHMAN & ASSOCIATES	**TITLE** PROPERTY LOCATION MAP	**PROJECT** 255 SOUTH KING STREET SEATTLE, WASHINGTON **PROJECT NO.** 1008.001	**PREPARED FOR** 255 S KING STREET LP 270 SOUTH HANFORD STREET SUITE 100 SEATTLE, WASHINGTON 98134	**PREPARED BY** ROTHMAN & ASSOCIATES 505 BROADWAY EAST, STE 115 SEATTLE, WA 98102	**SCALE** NO SCALE **DATE** 08.21.2017	**FIGURE** 1



LEGEND:

- MONITORING WELL
- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- (9.93') GROUNDWATER ELEVATION (FEBRUARY 8, 2018)

0 40' 80'

SCALE APPROXIMATE

ROTHMAN & ASSOCIATES

PREPARED BY
ROTHMAN & ASSOCIATES
505 BROADWAY EAST STE 115
SEATTLE, WASHINGTON 98102

PREPARED FOR
255 S. KING STREET LP
270 SOUTH HANFORD STREET, STE 100
SEATTLE, WASHINGTON 98134

PROJECT
255 S. KING STREET
SEATTLE, WASHINGTON

PROJECT NO.
1008.001

TITLE
GROUNDWATER ELEVATIONS (FEBRUARY 8, 2018)

FIGURE
2

SCALE 1"=40'

DATE
02.28.2018

TABLE

Table 1
Groundwater Data
North Lot Property
201 and 255 South King Street
Seattle, Washington

Monitoring Well ID	Sample Date	Depth to Groundwater (feet)	Groundwater Elevation (feet msl)	DRPH[1]	ORPH[1]	GRPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	PAHs[4]	Arsenic[5]
MW-16D	08/04/17	10.39	7.21	<50	<250	<100	<0.8	<1	<1	<3	*0.0753*	<1
TOC: 17.60'	11/08/17	10.12	7.48	<60	<300	<100	<0.8	<1	<1	<3	*0.0151*	<1
	02/08/18	9.50	8.10	<30	<150	<100	<0.8	1.0	<1	<3	*0.0151*	<1
MW-18D	08/02/17	11.09	6.08	<50	<250	<100	<0.8	<1	<1	<3	*0.0753*	7.01
TOC: 17.17'	11/08/17	10.71	6.46	<50	<250	<100	<0.8	<1	<1	<3	*0.0151*	2.87
	02/08/18	10.64	6.53	<30	<150	<100	<0.8	1.1	<1	<3	*0.0151*	1.25
MW-19	08/02/17	6.32	11.17	<50	<250	<100	<0.8	<1	<1	<3	*0.0753*	2.61
TOC: 17.49'	11/08/17	6.18	11.31	<65	<320	<100	<0.8	<1	<1	<3	***0.0164***	2.14
	02/08/18	7.65	9.84	36x	150	<100	<0.8	1.2	<1	<3	***0.02868***	2.42
MW-20	08/02/17	7.58	9.93	62x	<250	<100	<0.8	<1	<1	<3	*0.0753*	<1
TOC: 17.51'	11/08/17	7.59	9.92	<75	<380	<100	<0.8	<1	<1	<3	*0.0151*	<1
	02/08/18	9.45	8.06	42x	<150	<100	<0.8	<1	<1	<3	*0.0151*	<1
MW-21	08/02/17	9.73	7.44	<50	<250	<100	<0.8	<1	<1	<3	*0.0753*	6.23
TOC: 17.17'	11/08/17	9.45	7.72	<60	<300	<100	<0.8	<1	<1	<3	*0.0151*	4.34
	02/08/18	9.34	7.83	<30	<150	<100	<0.8	1.0	<1	<3	*0.0151*	1.74
MW-22	08/02/17	6.51	10.63	180x	<250	<100	<0.8	<1	<1	<3	*0.0753*	7.21
TOC: 17.14'	11/08/17	6.10	11.04	330	<300	<100	<0.8	<1	<1	<3	*0.0151*	5.97
	02/08/18	5.27	11.87	***640***	310x	<100	<0.8	<1	<1	<3	*0.0151*	1.72
Site-Specific Cleanup Levels for Groundwater[b]				**500**	**500**	**800**	**0.8**	**80**	**275**	**1,600**	**0.012[a]**	**5/21.3[b]**

640 = bold italics indicated that the concentration exceeds the cleanup level

Analytical data presented in micrograms per liter (µg/L)

DRPH = diesel-range petroleum hydrocarbons

EPA = U.S. Environmental Protection Agency

GRPH = gasoline-range petroleum hydrocarbons

msl = mean sea level

ORPH = oil-range petroleum hydrocarbons

PAHs = polycyclic aromatic hydrocarbons

TOC = top of casing elevation (feet) relative to mean sea level as measured by D.R. Strong Consulting Engineers on August 18, 2017

Laboratory Notes:

x=the sample chromatographic pattern does not resemble the fuel standard used for quantitation

[1]Analyzed by Northwest Method NWTPH-Dx.

[2]Analyzed by Northwest Method NWTPH-Gx.

[3]Analyzed by EPA Method 8021B.

[4]Analyzed by EPA Method 8071D SIM for low-level analysis of PAHs. While the reporting/detection limits for individual cPAHs, including benzo(a)pyrene, are below the site-specific cleanup level, it is not feasible to achieve a reporting limit/detection limit that can demonstrate a TEF (note a, below) below the site-specific cleanup level.

[5]Analyzed by EPA Method 200.8.

[6]Site-Specific Cleanup Levels established in Cleanup Plan Addendum, North Lot Property, Seattle, Washington. Prepared by Landau Associates on September 18, 2013.

[a]The total concentration that all cPAHs meet using the toxicity equivalency methodology in WAC 173-340-708(8). *Italics* indicate a toxicity equivalency based entirely or in part upon non-detectable concentrations of PAHs. If concentrations of detected benzo(a)pyrene and/or TEFs of additional detected PAHs exceed the cleanup level, results are presented in ***bold italic*** font.

[b]A cleanup level of 5 µg/L was agreed upon by Ecology for the western portion of the Site (MW-19 and MW-20). A background concentration of 21.3 µg/L will be used as the cleanup level for the eastern portion of the Site (MW-16D, MW-18D, MW-21, and MW-22).

APPENDIX A

Laboratory Analytical Results

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

February 16, 2018

Erin Rothman, Principal
Rothman & Associates
505 Broadway E., Suite 115
Seattle, WA 98102

Dear Ms Rothman:

Included are the results from the testing of material submitted on February 8, 2018 from the North Lot 1009.001, F&BI 802138 project. There are 24 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
RAA0216R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 8, 2018 by Friedman & Bruya, Inc. from the Rothman & Associates North Lot 1009.001, F&BI 802138 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Rothman & Associates
802138 -01	MW-20-20180208
802138 -02	MW-19-20180208
802138 -03	MW-16D-20180208
802138 -04	MW-21-20180208
802138 -05	MW-22-20180208
802138 -06	MW-18D-20180208
802138 -07	Blind Duplicate

All quality control requirements were acceptable.

Date of Report: 02/16/18
Date Received: 02/08/18
Project: North Lot 1009.001, F&BI 802138
Date Extracted: 02/12/18
Date Analyzed: 02/12/18

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)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
MW-20-20180208 802138-01	<0.8	<1	<1	<3	<100	102
MW-19-20180208 802138-02	<0.8	1.2	<1	<3	<100	94
MW-16D-20180208 802138-03	<0.8	1.0	<1	<3	<100	101
MW-21-20180208 802138-04	<0.8	1.0	<1	<3	<100	81
MW-22-20180208 802138-05	<0.8	<1	<1	<3	<100	96
MW-18D-20180208 802138-06	<0.8	1.1	<1	<3	<100	98
Blind Duplicate 802138-07	<0.8	<1	<1	<3	<100	84
Method Blank 08-237 MB	<0.8	<1	<1	<3	<100	97

Date of Report: 02/16/18
Date Received: 02/08/18
Project: North Lot 1009.001, F&BI 802138
Date Extracted: 02/09/18
Date Analyzed: 02/09/18

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)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-134)
MW-20-20180208 802138-01 1/0.6	42 x	<150	98
MW-19-20180208 802138-02 1/0.5	36 x	150	112
MW-16D-20180208 802138-03 1/0.6	<30	<150	105
MW-21-20180208 802138-04 1/0.6	<30	<150	99
MW-22-20180208 802138-05 1/0.5	640	310 x	116
MW-18D-20180208 802138-06 1/0.5	<30	<150	105
Blind Duplicate 802138-07 1/0.5	39 x	150	109
Method Blank 08-311 MB	<50	<250	118

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-20-20180208	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/12/18	Lab ID:	802138-01
Date Analyzed:	02/12/18	Data File:	802138-01.065
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-19-20180208	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/12/18	Lab ID:	802138-02
Date Analyzed:	02/12/18	Data File:	802138-02.066
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.42
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-16D-20180208	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/12/18	Lab ID:	802138-03
Date Analyzed:	02/12/18	Data File:	802138-03.071
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-21-20180208	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/12/18	Lab ID:	802138-04
Date Analyzed:	02/12/18	Data File:	802138-04.072
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.74
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-22-20180208	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/12/18	Lab ID:	802138-05
Date Analyzed:	02/12/18	Data File:	802138-05.073
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.72
Cadmium	<1
Chromium	1.06
Copper	22.8
Lead	<1
Mercury	<1
Zinc	7.45

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-18D-20180208	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/12/18	Lab ID:	802138-06
Date Analyzed:	02/12/18	Data File:	802138-06.080
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	1.25
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	7.72

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Blind Duplicate	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/12/18	Lab ID:	802138-07
Date Analyzed:	02/12/18	Data File:	802138-07.081
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	2.50
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Rothman & Associates
Date Received:	NA	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/12/18	Lab ID:	I8-097 mb
Date Analyzed:	02/12/18	Data File:	I8-097 mb.055
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Mercury	<1
Zinc	<5

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-20-20180208	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/13/18	Lab ID:	802138-01 1/0.25
Date Analyzed:	02/14/18	Data File:	021410.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91	31	160
Benzo(a)anthracene-d12	94	25	165

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-19-20180208	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/13/18	Lab ID:	802138-02 1/0.25
Date Analyzed:	02/14/18	Data File:	021411.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	88	31	160
Benzo(a)anthracene-d12	80	25	165

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	0.016
Chrysene	0.018
Benzo(a)pyrene	0.021
Benzo(b)fluoranthene	0.026
Benzo(k)fluoranthene	0.010
Indeno(1,2,3-cd)pyrene	0.013
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-16D-20180208	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/13/18	Lab ID:	802138-03 1/0.25
Date Analyzed:	02/14/18	Data File:	021412.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	89	31	160
Benzo(a)anthracene-d12	81	25	165

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-21-20180208	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/13/18	Lab ID:	802138-04 1/0.25
Date Analyzed:	02/14/18	Data File:	021413.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91	31	160
Benzo(a)anthracene-d12	90	25	165

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-22-20180208	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/13/18	Lab ID:	802138-05 1/0.25
Date Analyzed:	02/14/18	Data File:	021414.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	86	31	160
Benzo(a)anthracene-d12	78	25	165

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-18D-20180208	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/13/18	Lab ID:	802138-06 1/0.25
Date Analyzed:	02/14/18	Data File:	021415.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	31	160
Benzo(a)anthracene-d12	93	25	165

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Blind Duplicate	Client:	Rothman & Associates
Date Received:	02/08/18	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/13/18	Lab ID:	802138-07 1/0.25
Date Analyzed:	02/14/18	Data File:	021416.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	90	31	160
Benzo(a)anthracene-d12	75	25	165

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	0.041
Chrysene	0.048
Benzo(a)pyrene	0.059
Benzo(b)fluoranthene	0.081
Benzo(k)fluoranthene	0.032
Indeno(1,2,3-cd)pyrene	0.024
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Rothman & Associates
Date Received:	Not Applicable	Project:	North Lot 1009.001, F&BI 802138
Date Extracted:	02/13/18	Lab ID:	08-331 mb 1/0.25
Date Analyzed:	02/14/18	Data File:	021408.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	31	160
Benzo(a)anthracene-d12	91	25	165

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Date of Report: 02/16/18
Date Received: 02/08/18
Project: North Lot 1009.001, F&BI 802138

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: 802138-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Benzene	ug/L (ppb)	<0.8	<0.8	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	110	72-119
Toluene	ug/L (ppb)	50	103	71-113
Ethylbenzene	ug/L (ppb)	50	105	72-114
Xylenes	ug/L (ppb)	150	92	72-113
Gasoline	ug/L (ppb)	1,000	87	70-119

Date of Report: 02/16/18
Date Received: 02/08/18
Project: North Lot 1009.001, F&BI 802138

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	96	108	58-134	12

Date of Report: 02/16/18
Date Received: 02/08/18
Project: North Lot 1009.001, F&BI 802138

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 802153-08 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<10	99	97	70-130	2
Cadmium	ug/L (ppb)	5	<10	101	103	70-130	2
Chromium	ug/L (ppb)	20	<10	93	92	70-130	1
Copper	ug/L (ppb)	20	<50	114	118	70-130	3
Lead	ug/L (ppb)	10	<10	103	103	70-130	0
Mercury	ug/L (ppb)	5	<10	95	100	70-130	5
Zinc	ug/L (ppb)	50	6,220	0 b	0 b	70-130	0 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	101	85-115
Cadmium	ug/L (ppb)	5	104	85-115
Chromium	ug/L (ppb)	20	97	85-115
Copper	ug/L (ppb)	20	99	85-115
Lead	ug/L (ppb)	10	95	85-115
Mercury	ug/L (ppb)	5	89	85-115
Zinc	ug/L (ppb)	50	101	85-115

Date of Report: 02/16/18
Date Received: 02/08/18
Project: North Lot 1009.001, F&BI 802138

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benz(a)anthracene	ug/L (ppb)	0.25	94	95	60-118	1
Chrysene	ug/L (ppb)	0.25	93	95	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	0.25	93	93	55-135	0
Benzo(k)fluoranthene	ug/L (ppb)	0.25	87	86	62-125	1
Benzo(a)pyrene	ug/L (ppb)	0.25	90	90	58-127	0
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	0.25	95	97	36-142	2
Dibenz(a,h)anthracene	ug/L (ppb)	0.25	93	97	37-133	4

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.

802138

SAMPLE CHAIN OF CUSTODY ME 02-8-18

B05 / MW2 / AE2

Page # 1 of 1

Report To Erin Rothman

Company Rothman Associates

Address

City, State, ZIP

Phone (206) 795-0978 Email Erin@rothmanassociates.com

SAMPLERS (*signature*)

PROJECT NAME: North Lot

PO #: 1009.001

REMARKS

INVOICE TO: Erin

TURNAROUND TIME
- [X] Standard Turnaround
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [X] Dispose after 30 days
- [ ] Archive Samples
- [ ] Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	Low Level cPAHs 8270D SIM	Dissolved metals: As, Cd, Cr, Pb, Hg, Zn				Notes
						ANALYSES REQUESTED											
MW-20-20180208	01 A-G	2/8/18	930	Water	7		X	X	X			X	X				cPAHs per ER 2/16/18 MC
MW-19-20180208	02	2/8/18	1035														Benzene RL = 0.8 µg/L please
MW-16D-20180208	03		11:50														
MW-21-20180208	04		13:50														
MW-22-20180208	05		12:55														
MW-18D-20180208	06		15:02														Time 1507 on labels
Blind Duplicate	07		—														
																	Samples received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Mike Pruark	EHSI	2/8/18	16:40
Received by:	Mike Brady	EHSI	2/8	16:40
Relinquished by:				17:36
Received by:	Yelena Aravina	F&B, Inc.	2/8/18	17:48

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