June 2016 Groundwater Monitoring
Columbia Park West Marina
Richland, Washington

September 20, 2016

SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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Submitted To:
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22-1-11288-003

SHANNON & WILSON, INC.
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September 20, 2016

City of Richland, Parks and Recreation
P.O. Box 190
2700 Duportail Street
Building 100, MS 6
Richland, Washington 99354

Attn: Mr. Phil Pinard

RE: GROUNDWATER MONITORING, COLUMBIA PARK WEST MARINA, ECOLOGY SITE 84244226, RICHLAND, WASHINGTON

The attached report provides the results of the fifth groundwater sampling event conducted at the Columbia Park West Marina in Richland, Washington. The sampling was performed as a follow-up to Shannon & Wilson's 2014 remedial investigation, and in accordance with City of Richland Contract 246-15.

Thank you for the opportunity to provide these services. Please contact us if you have questions, or would like further explanation of the materials or conclusions presented.

Respectfully submitted,

SHANNON & WILSON, INC.

Ladd Anderson
Geotechnical/Environmental Staff

LLA:DRP:SWG/lla

Enclosure: June 2016 Groundwater Monitoring Report

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JUNE 2016 GROUNDWATER MONITORING
COLUMBIA PARK WEST MARINA
RICHLAND, WASHINGTON

1.0 INTRODUCTION AND BACKGROUND INFORMATION

The City of Richland (City) contracted with Shannon & Wilson, Inc. to collect groundwater samples from monitoring wells at the Columbia Park West Marina (Marina). The site is identified in Washington Department of Ecology's (Ecology) records as Columbia Park Marina, Facility ID #84244226 at 1776 Columbia Park Trail in Richland, Washington. The Marina is approximately 950 feet east of the Columbia Center Boulevard and Columbia Park Trail intersection. Figure 1 is a vicinity map and Figure 2 is a site plan.

Ecology sent letters to the City and Mr. Lynne Koehler dated April 19, 2013 requiring that a remedial investigation (RI) be conducted to characterize potential impacts to subsurface soil and groundwater at the Marina site. The triggering event was the release of gasoline that was discovered during removal of two underground storage tanks (USTs) in 1994.

The subject site is owned by the United States Army Corps of Engineers (Corps) and is adjacent to the Columbia River. The City leases the property, and previously subleased the Marina to Lynne Koehler. Mr. Koehler owned and operated The Boat Shop, which is no longer present.

According to a tank closure report (White Shield, 1994) two 1,000-gallon leaded gasoline USTs were removed in April 1994. Based on drawings and descriptions in the report, the tanks and dispensers were located approximately 40 feet south of the Columbia River and west of the boat launch ramp. The estimated former UST and The Boat Shop locations are shown on Figure 2.

The 1994 report indicates that the two USTs were removed from a single basin that measured approximately 10 by 23 feet by 8 feet deep. A soil sample collected from approximately 8 feet below the ground surface (bgs) in the excavation had a concentration of 6,300 milligrams per kilogram (mg/kg) of gasoline range total petroleum hydrocarbons (TPH-G), and also had detections of benzene, toluene, ethylbenzene and xylenes (BTEX). A water sample collected from the tank basin had a TPH-G concentration of 39,000 micrograms per liter (µg/L). These detections exceeded the Model Toxics Control Act (MTCA) Method A cleanup levels.

The report indicates that cleanup actions were performed related to water and soil. Water remediation involved operating an aeration system in the tank basin, followed by pumping the standing water into barrels. A week later, after the water recharged, another water sample was collected from the basin. TPH-G and BTEX were not detected in the second sample at greater than the laboratory test detection limits.

Soil remediation consisted of over-excavating approximately 7 cubic yards of soil from the basin base. A follow-up soil sample was collected from the base, and detected concentrations of TPH-G and/or BTEX were less than the 1994 MTCA Method A cleanup levels.

2.0 REMEDIAL INVESTIGATION SUMMARY

In February 2014, Shannon & Wilson performed a RI that included collecting soil samples from three borings in the vicinity of the former USTs and installing groundwater monitoring wells in each boring. Relative to the former tank basin, monitoring well MW-1 is located to the south, MW-2 is located northwest and MW-3 is located northeast. The well locations are shown on Figure 2. Shannon & Wilson collected the first set of groundwater samples from the wells in March 2014. The RI description and findings are included in Shannon & Wilson's April 21, 2014 report.

3.0 GROUNDWATER SAMPLING

3.1 Groundwater Elevations and Sampling Methodology

Shannon & Wilson conducted the fifth groundwater monitoring and sampling event on June 29, 2016. Field activities included the following:

- Measuring depth to groundwater in each well using an electronic water level indicator prior to sampling.
- Purging water from the wells and collected groundwater samples in general accordance with EPA low-flow sampling procedures (April 1996).
- Shipping samples to OnSite Environmental (OnSite) of Redmond, Washington for laboratory analyses.

Groundwater elevation measurements from the previous and current monitoring events are summarized in Table 1. Figure 2 shows approximate groundwater elevation contours and the groundwater flow direction on June 29, 2016, which was toward the northwest.

The low-flow purging and sampling process included the following steps: 1) Purge water from the well using a peristaltic pump; 2) pass the purge water through a flow-through cell, periodically measuring pH, temperature, conductivity, dissolved oxygen, oxidation/reduction potential (ORP) or redox, and turbidity; and 3) after measurements stabilize, disconnect the flow-through cell and collect a water sample for laboratory analysis. Samples were collected directly in laboratory-furnished bottles, labeled, logged onto a chain-of-custody form, packed with ice in a cooler, and shipped by over-night delivery to OnSite.

To reduce the potential for cross-contamination, reusable equipment was decontaminated prior to first use and between each well. New, single-use disposable tubing was used at each well. Also to reduce potential for cross-contamination, the sampling sequence started with the upgradient well

(MW-1), followed by the downgradient wells MW-2 and MW-3. Field and sample handling procedures were in accordance with standard environmental protocols.

3.2 Field Measurements

As described in the sampling procedures, Shannon & Wilson's representative measured parameters in the water pumped from the wells during the purging process. The primary objective was to observe when the parameters stabilized so a sample could then be collected for laboratory analyses. The measurements may also be indicative of the absence or presence of contaminants undergoing biological activity. A summary of the field parameters at the completion of well purging is included in Table 2.

Specific conductivity, pH, and temperature are measured to evaluate if groundwater conditions are similar between wells, or if significant variations are present. An increase in water temperature and a decrease in pH may suggest active biodegradation and the generation of organic acids. There were no significant differences between these parameters among the three wells during the sampling event.

ORP is a measure of electron activity and indicates the tendency of a solution to gain or lose electrons. In general, under oxidizing (aerobic) conditions the ORP readings are positive, whereas the readings are negative under reducing (anaerobic) conditions. ORP was positive at all three wells during the sampling event.

As indicated in Section 2.0, the water samples collected in March 2014 using disposable bailers were quite turbid (460 to >1,000 NTUs). Using the low-flow sampling method, turbidities have been much lower ranging from 2.52 to 13.0 NTUs during the September 2014 event, 0.93 to 1.17 NTUs during the December 2015 event, 0.23 to 1.16 NTUs during the March 2016 event, and 0.28 to 0.46 during the June 2016 event.

3.3 Results of Laboratory Analysis

Groundwater samples from the three wells were analyzed for petroleum constituents by NWTPH-Gx and for total lead by EPA Method 200.8. Petroleum constituents (gasoline range TPH, BTEX) were not detected in the groundwater samples at greater than the laboratory PQLs. Lead was detected in MW-1 at 1.2 µg/L but below the MTCA Method A Cleanup Level of 15 µg/L. Results are summarized in Table 3, and the laboratory report is included in Appendix A.

3.4 Previous Monitoring Events

Shannon & Wilson's representative collected initial groundwater samples from the three wells on March 11, 2014. The procedure included purging and sampling using disposable bailers. Water samples from all of the wells were turbid (460 to >1,000 nephelometric turbidity units [NTU]).

The color was light brown, similar to the soil color observed during well installation. The sample from MW-2 had the highest turbidity readings.

Groundwater samples from the wells were analyzed by the following methods: NWTPH-Gx/BTEX and total lead by EPA Method 200.8. Petroleum constituents (gasoline range TPH and BTEX) were not detected in the samples at greater than the laboratory Practical Quantitation Limits (PQLs). Lead was detected in the samples at concentrations of 7.0, 11 and 71 micrograms per liter (µg/L) in samples from MW-3, MW-1, and MW-2, respectively. The MTCA Method A cleanup level for groundwater is 15 µg/L. Two of the results are less than this level; however, the sample from MW-2 at a concentration of 71 µg/L exceeded the criterion.

Shannon & Wilson conducted a second groundwater monitoring event on September 24, 2014. Groundwater samples from the three site wells were analyzed by methods NWTPH-Gx/BTEX and total and dissolved lead by EPA Method 200.8. Petroleum constituents (gasoline range TPH and BTEX) and lead were not detected in the samples at greater than the laboratory PQLs.

Shannon & Wilson conducted a third groundwater monitoring event on December 7, 2015. Groundwater samples were analyzed by methods NWTPH-Gx, volatile organic compounds (VOCs) by EPA Method 8260C, 1,2-dibromoethane (EDB) by EPA Method 8011, and total lead by EPA Method 200.8. In addition to EDB, other VOCs included BTEX and the fuel additives methyl t-butyl ether (MTBE), 1,2-dichloroethane (EDC or DCA), t-butanol (TBA), t-butyl ethyl ether (ETBE) and t-amyl methyl ether (TAME). Petroleum constituents (gasoline range TPH, BTEX, and fuel additives) and lead were not detected in the groundwater samples at greater than the laboratory PQLs.

Shannon & Wilson conducted a fourth groundwater monitoring event on March 21, 2016. Groundwater samples from the three site wells were analyzed by methods NWTPH-Gx/BTEX and total and dissolved lead by EPA Method 200.8. Petroleum constituents (gasoline range TPH and BTEX) and lead were not detected in the samples at greater than the laboratory PQLs.

4.0 FINDINGS AND CONCLUSIONS

Soil and groundwater sampling conducted during the February/March 2014 investigation in the vicinity and downgradient of the former USTs location did not detect residual petroleum product impacts to soil or groundwater. Lead was detected in the March 2014 groundwater samples from all of the wells; the concentration of 71 µg/L in the sample from MW-2 exceeded the MTCA Method A cleanup level of 15 µg/L.

The initial, bailer-collected water samples were very turbid. Because of the potential that lead was detected due to soil particulates in the groundwater samples, we selected an alternative sampling method for the September 2014, December 2015, March 2016, and June 2016 monitoring events. Lead was not detected in any of the September 2014, December 2015, and March 2016 samples at greater than the PQL. Lead was detected in June 2016 samples greater than the PQL but below

the MTCA Method A Cleanup Level. In our opinion, the initial lead detections were an artifact of soil particulates in the sample.

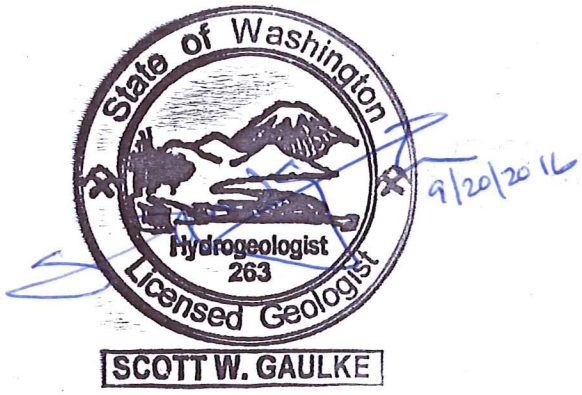
5.0 CLOSURE

Within the limitations of scope, schedule, and budget, Shannon & Wilson has prepared this report in a professional manner, using that level of skill and care normally exercised for similar projects under similar conditions by reputable and competent environmental consultants currently practicing in this area. The data presented in this report are based on limited research and sampling at the site and should be considered representative at the time of our observations. Shannon & Wilson performed this work within its best judgment to adequately describe site conditions. Changes in the conditions of the site can occur with time from both natural processes and human activities. In addition, changes in governmental codes, regulations, or law may occur. Such changes are beyond our control, and should they occur, our observations and recommendations applicable to this facility may need to be revised wholly or in part.

This report was prepared for the use of the City of Richland and their representatives. Shannon & Wilson in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. Shannon & Wilson has prepared the attached "Important Information about Your Environmental Report" to assist you and others in understanding the use and limitations of our reports (Appendix B).

SHANNON & WILSON, INC.

Ladd L. Anderson
Geotechnical and Environmental Staff



Scott W. Gaulke, PE, LHG
Vice President

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Washington State Department of Ecology, Updated June 30, 2009, Dangerous Waste Regulations, Chapter 173-303 WAC, Publication No. 92-91.

Washington State Department of Ecology, May 30, 2000, correspondence to Mr. Lynne Koehler RE: Voluntary Cleanup Review, The Boat Shop, 1238 Columbia Drive, Richland.

Washington State Department of Ecology, November 17, 2009, correspondence to Mr. Lynne Koehler RE: Release of Hazardous Substance at the Columbia Park Marina located at 1776 Columbia Drive SE, Richland, Washington; Facility/Site ID #84244226.

Washington State Department of Ecology, April 19, 2013, correspondence to City of Richland and to Mr. Lynne Koehler RE: A Reported Release of Hazardous Substances and Potential Liability for the Release.

White Shield, Inc., June 27, 1994, *LUST Closure/Interim Cleanup Report, The Boat Shop WSDOE Site #009266, Richland, Washington*.

TABLE 1
GROUNDWATER ELEVATIONS

	Well Identification		
	MW-1	**MW-2**	**MW-3**
Total Well Depth (measured)	14.8	14.15	13.4
Top of Casing Elevation	352.92	349.63	350.26
Depth To Water			
02/26/2014	9.66	6.86	7.41
03/11/2014	8.93	5.63	6.19
09/24/2014	8.40	6.01	6.48
12/07/2015	8.86	6.18	6.74
03/21/2016	8.99	5.96	6.57
06/29/2016	8.92	5.85	6.4
Groundwater Elevation			
02/26/2014	343.27	342.77	342.85
03/11/2014	343.99	344.00	344.00
09/24/2014	344.53	343.62	343.78
12/07/2015	344.06	343.45	343.52
03/21/2016	343.93	343.67	343.69
06/29/2016	344.00	343.78	343.86

Measurements and elevations are in feet.
Top of casing elevations were surveyed by Stratton Surveying & Mapping.

TABLE 2
SUMMARY OF FIELD PARAMETERS

Well ID	Date Measured	DO (mg/L)	ORP (mV)	Conductivity (µmhos/cm)	pH	Temperature (°C)	Turbidity (NTU)
MW-1	09/24/2014	4.33	51.1	542	6.83	17.37	3.0
	12/07/2015	3.76	441.0	543	6.40	16.41	0.93
	03/21/2016	3.74	353.4	534	6.83	16.02	0.23
	06/29/2016	3.28	349.8	535	6.89	20.82	0.46
MW-2	09/24/2014	2.68	48.3	614	6.80	18.94	13
	12/07/2015	3.14	350.7	590	7.04	17.22	1.12
	03/21/2016	4.60	331.4	605	6.90	14.60	1.16
	06/29/2016	3.91	258.6	628	6.98	18.91	0.36
MW-3	09/24/2014	3.44	33.9	583	6.83	19.19	2.52
	12/07/2015	3.72	356.9	566	7.09	16.88	1.17
	03/21/2016	4.35	329.7	570	6.90	15.58	0.57
	06/29/2016	4.78	252.5	581	7.07	19.54	0.28

DO	Dissolved oxygen	mV	millivolts
mg/L	milligrams per liter	µmhos/cm	micromhos per centimeter
ORP	Oxidation/reduction potential	NTU	Nephelometric turbidity units

TABLE 3
GROUNDWATER SAMPLE ANALYTICAL RESULTS in µg/L

Well ID	Sample No.	TPH-G	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	EDC	TBA	ETBE	TAME	EDB	Lead	
													Total	Dis-solved
3/11/2014														
MW-1	CPWM-MW1-01	<100	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	11	NA
MW-2	CPWM-MW2-01	<100	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	**71**	NA
MW-3	CPWM-MW3-01	<100	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	7.0	NA
9/24/2014														
MW-1	CPWM-MW1-02	<100	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	<1.1	<1.0
MW-2	CPWM-MW2-02	<100	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	<1.1	<1.0
MW-3	CPWM-MW3-02	<100	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	<1.1	<1.0
12/07/2015														
MW-1	MW-1-03	<100	<0.20	<1.0	<0.20	<0.6	<0.20	<0.20	<5.0	<1.0	<1.0	<0.0090	<1.1	NA
MW-2	MW-2-03	<100	<0.20	<1.0	<0.20	<0.6	<0.20	<0.20	<5.0	<1.0	<1.0	<0.0090	<1.1	NA
MW-3	MW-3-03	<100	<0.20	<1.0	<0.20	<0.6	<0.20	<0.20	<5.0	<1.0	<1.0	<0.0090	<1.1	NA
3/21/2016														
MW-1	MW-1-04	<100	<0.20	<1.0	<0.20	<0.6	NA	NA	NA	NA	NA	NA	<1.1	NA
MW-2	MW-2-04	<100	<0.20	<1.0	<0.20	<0.6	NA	NA	NA	NA	NA	NA	<1.1	NA
MW-3	MW-3-04	<100	<0.20	<1.0	<0.20	<0.6	NA	NA	NA	NA	NA	NA	<1.1	NA
6/29/2016														
MW-1	MW-1-05	<100	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	1.2	NA
MW-2	MW-2-05	<100	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	<1.1	NA
MW-3	MW-3-05	<100	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	<1.1	NA
MTCA Method A Cleanup Level		1,000	5	1,000	700	1,000	20	5				0.01	15	15

µg/L	micrograms per liter
NA	not analyzed
TPH-G	Gasoline range total petroleum hydrocarbons
MTBE	Methyl tertiary-butyl ether
EDC	1,2-Dichloroethane
TBA	Tertiary-butyl alcohol
ETBE	Ethyl tertiary-butyl ether
TAME	Tertiary-amyl methyl ether
EDB	1,2-Dibromoethane
MTCA Method A	Model Toxics Control Act Method A cleanup levels for groundwater

0 300 600

Approximate Scale in Feet

NOTE

Map adapted from aerial imagery provided by Google Earth Pro, reproduced by permission granted by Google Earth ™ Mapping Service.

Columbia Park West Marina
Richland, Washington

SITE LOCATION MAP

September 2016 22-1-11288-003

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FIG. 1

Filename: I:\Project Files (Working Copies)\22-1-11200s (Env Pjts)\22-1-11288 Columbia Park West MW\reports\June 2016\Figures\22-1-11288-003 Fig 1.dwg Date: 09-13-2016 Login: ###

0 60 120

Scale in Feet

LEGEND

MW-1 (343.93) — Monitoring Well Designation and Approximate Location (Groundwater Elevation in Feet, 6-29-16)

343.8 — Approximate Groundwater Elevation

Approximate Groundwater Flow Direction

NOTE

This figure is adapted from *City of Richland Columbia Park West Parking Lot and Landscaping Improvements Site and Utility Plan*, dated June 1998.

Columbia Park West Marina
Richland, Washington

SITE PLAN AND MONITORING WELL LOCATIONS

September 2016 22-1-11288-003

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FIG. 2

Filename: I:\Project Files (Working Copies)\22-1-11200s (Env Pjts)\22-1-11288 Columbia Park West MW\reports\June 2016\Figures\22-1-11288-003 Fig 2.dwg Date: 09-13-2016 Login: ###

APPENDIX A

LABORATORY REPORT

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

July 12, 2016

Donna Parkes
Shannon & Wilson, Inc.
2705 Saint Andrews Loop, Suite A
Pasco, WA 99301

Re: Analytical Data for Project 22-1-11288-003
Laboratory Reference No. 1607-001

Dear Donna:

Enclosed are the analytical results and associated quality control data for samples submitted on July 1, 2016.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: July 12, 2016
Samples Submitted: July 1, 2016
Laboratory Reference: 1607-001
Project: 22-1-11288-003

Case Narrative

Samples were collected on June 29, 2016 and received by the laboratory on July 1, 2016. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: July 12, 2016
Samples Submitted: July 1, 2016
Laboratory Reference: 1607-001
Project: 22-1-11288-003

NWTPH-Gx/BTEX

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW1-W-05**					
Laboratory ID:	07-001-01					
Benzene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
Toluene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
Ethyl Benzene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
m,p-Xylene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
o-Xylene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
Gasoline	**ND**	100	NWTPH-Gx	7-5-16	7-5-16	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*81*	*71-111*				
Client ID:	**MW2-W-05**					
Laboratory ID:	07-001-02					
Benzene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
Toluene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
Ethyl Benzene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
m,p-Xylene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
o-Xylene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
Gasoline	**ND**	100	NWTPH-Gx	7-5-16	7-5-16	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*80*	*71-111*				
Client ID:	**MW3-W-05**					
Laboratory ID:	07-001-03					
Benzene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
Toluene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
Ethyl Benzene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
m,p-Xylene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
o-Xylene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
Gasoline	**ND**	100	NWTPH-Gx	7-5-16	7-5-16	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*79*	*71-111*				

Date of Report: July 12, 2016
Samples Submitted: July 1, 2016
Laboratory Reference: 1607-001
Project: 22-1-11288-003

NWTPH-Gx/BTEX
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0705W1					
Benzene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
Toluene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
Ethyl Benzene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
m,p-Xylene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
o-Xylene	**ND**	1.0	EPA 8021B	7-5-16	7-5-16	
Gasoline	**ND**	100	NWTPH-Gx	7-5-16	7-5-16	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*79*	*71-111*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	06-327-01										
	ORIG	DUP									
Benzene	**2.56**	**2.30**	NA	NA		NA		NA	11	30	
Toluene	**9.13**	**8.35**	NA	NA		NA		NA	9	30	
Ethyl Benzene	**3.26**	**3.04**	NA	NA		NA		NA	7	30	
m,p-Xylene	**6.34**	**5.59**	NA	NA		NA		NA	13	30	
o-Xylene	**1.60**	**1.34**	NA	NA		NA		NA	18	30	
Gasoline	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Surrogate:											
Fluorobenzene						*83*	*82*	*71-111*			

MATRIX SPIKES											
Laboratory ID:	06-327-01										
	MS	MSD	MS	MSD		MS	MSD				
Benzene	**49.5**	**49.9**	50.0	50.0	2.56	**94**	**95**	83-123	1	15	
Toluene	**54.9**	**55.5**	50.0	50.0	9.13	**92**	**93**	83-124	1	16	
Ethyl Benzene	**49.8**	**50.5**	50.0	50.0	3.26	**93**	**94**	82-123	1	15	
m,p-Xylene	**52.0**	**52.6**	50.0	50.0	6.34	**91**	**93**	81-125	1	17	
o-Xylene	**48.1**	**48.4**	50.0	50.0	1.60	**93**	**94**	82-123	1	15	

Date of Report: July 12, 2016
Samples Submitted: July 1, 2016
Laboratory Reference: 1607-001
Project: 22-1-11288-003

TOTAL LEAD
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	EPA Method	Date Prepared	Date Analyzed	Flags
Lab ID:	07-001-01					
Client ID:	**MW1-W-05**					
Lead	**1.2**	1.0	200.8	7-5-16	7-5-16	
Lab ID:	07-001-02					
Client ID:	**MW2-W-05**					
Lead	**ND**	1.0	200.8	7-5-16	7-5-16	
Lab ID:	07-001-03					
Client ID:	**MW3-W-05**					
Lead	**ND**	1.0	200.8	7-5-16	7-5-16	

Date of Report: July 12, 2016
Samples Submitted: July 1, 2016
Laboratory Reference: 1607-001
Project: 22-1-11288-003

TOTAL LEAD
EPA 200.8
METHOD BLANK QUALITY CONTROL

Date Extracted:	7-5-16
Date Analyzed:	7-5-16
Matrix:	Water
Units:	ug/L (ppb)
Lab ID:	MB0705WH1

Analyte	Method	Result	PQL
Lead	200.8	**ND**	1.0

Date of Report: July 12, 2016
Samples Submitted: July 1, 2016
Laboratory Reference: 1607-001
Project: 22-1-11288-003

TOTAL LEAD
EPA 200.8
DUPLICATE QUALITY CONTROL

Date Extracted: 7-5-16
Date Analyzed: 7-5-16

Matrix: Water
Units: ug/L (ppb)

Lab ID: 06-301-08

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Lead	**ND**	**ND**	NA	1.0	

Date of Report: July 12, 2016
Samples Submitted: July 1, 2016
Laboratory Reference: 1607-001
Project: 22-1-11288-003

TOTAL LEAD
EPA 200.8
MS/MSD QUALITY CONTROL

Date Extracted: 7-5-16
Date Analyzed: 7-5-16

Matrix: Water
Units: ug/L (ppb)

Lab ID: 06-301-08

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Lead	100	**91.7**	92	**96.9**	97	6	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

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

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a Sulfuric acid/Silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in method 8260C, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: Shannon & Wilson, Pasco
Project Number: 22-1-11280-003
Project Name: Columbia Park West Marina, Wa. Rich.
Project Manager:
Sampled by:

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

Laboratory Number: 07-001

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx	Volatiles 8260C	Halogenated Volatiles 8260C	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	Total Lead	% Moisture
1	MW1-W-05	6/29/16	1322	Water	4		X															X	
2	MW2-W-05	↓	1400	↓	↓		X															X	
3	MW3-W-05	↓	1451	↓	↓		X															X	

	Signature	Company	Date	Time
Relinquished		Shannon & Wilson	6/30/16	0900
Received		OBE	6/1/16	1000
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Chromatograms with final report ☐

Data Package: Standard ☐ Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☒ _____

APPENDIX B

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL REPORT

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL SITE ASSESSMENT/EVALUATION REPORT

ENVIRONMENTAL SITE ASSESSMENTS/EVALUATIONS ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

This report was prepared to meet the needs you specified with respect to your specific site and your risk management preferences. Unless indicated otherwise, we prepared your report expressly for you and for the purposes you indicated. No one other than you should use this report for any purpose without first conferring with us. No one is authorized to use this report for any purpose other than that originally contemplated without our prior written consent.

The findings and conclusions documented in this site assessment/evaluation 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 this area. The conclusions presented are based on interpretation of information currently available to us and are made within the operational scope, budget, and schedule constraints of this project. No warranty, express or implied, is made.

OUR REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Our environmental site assessment is based on several factors and may include (but not be limited to): reviewing public documents to chronicle site ownership for the past 30, 40, or more years; investigating the site's regulatory history to learn about permits granted or citations issued; determining prior uses of the site and those adjacent to it; reviewing available topographic and real estate maps, historical aerial photos, geologic information, and hydrologic data; reviewing readily available published information about surface and subsurface conditions; reviewing federal and state lists of known and potentially contaminated sites; evaluating the potential for naturally occurring hazards; and interviewing public officials, owners/operators, and/or adjacent owners with respect to local concerns and environmental conditions.

Except as noted within the text of the report, no sampling or quantitative laboratory testing was performed by us as part of this site assessment. Where such analyses were conducted by an outside laboratory, Shannon & Wilson relied upon the data provided and did not conduct an independent evaluation regarding the reliability of the data.

CONDITIONS CAN CHANGE.

Site conditions, both surface and subsurface, may be affected as a result of natural processes or human influence. An environmental site assessment/evaluation is based on conditions that existed at the time of the evaluation. Because so many aspects of a historical review rely on third party information, most consultants will refuse to certify (warrant) that a site is free of contaminants, as it is impossible to know with absolute certainty if such a condition exists. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas that showed no signs of contamination at the time they were studied.

Unless your consultant indicates otherwise, your report should not be construed to represent geotechnical subsurface conditions at or adjacent to the site and does not provide sufficient information for construction-related activities. Your report also should not be used following floods, earthquakes, or other acts of nature; if the size or configuration of the site is altered; if the location of the site is modified; or if there is a change of ownership and/or use of the property.

INCIDENTAL DAMAGE MAY OCCUR DURING SAMPLING ACTIVITIES.

Incidental damage to a facility may occur during sampling activities. Asbestos and lead-based paint sampling often require destructive sampling of pipe insulation, floor tile, walls, doors, ceiling tile, roofing, and other building materials. Shannon & Wilson does not provide for paint repair. Limited repair of asbestos sample locations are provided. However, Shannon & Wilson neither warranties repairs made by our field personnel, nor are we held liable for injuries or damages as a result of those repairs. If you desire a specific form of repair, such as those provided by a licensed roofing contractor, you need to request the specific repair at the time of the proposal. The owner is responsible for repair methods that are not specified in the proposal.

READ RESPONSIBILITY CLAUSES CAREFULLY.

Environmental site assessments/evaluations are less exact than other design disciplines because they are based extensively on judgment and opinion, and there may not have been any (or very limited) investigation of actual subsurface conditions. Wholly unwarranted claims have been lodged against consultants. To limit this exposure, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses may appear in this report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

Consultants cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed, or conditions at the site have changed. Therefore, it is incumbent upon you to notify your consultant of any factors that may have changed prior to submission of the final assessment/evaluation.

An assessment/evaluation of a site helps reduce your risk, but does not eliminate it. Even the most rigorous professional assessment may fail to identify all existing conditions.

ONE OF THE OBLIGATIONS OF YOUR CONSULTANT IS TO PROTECT THE SAFETY, HEALTH, PROPERTY, AND WELFARE OF THE PUBLIC.

If our environmental site assessment/evaluation discloses the existence of conditions that may endanger the safety, health, property, or welfare of the public, we may be obligated under rules of professional conduct, statutory law, or common law to notify you and others of these conditions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland