SUBMITTED TO:
Roza Irrigation District
125 S. 13th Street
Sunnyside, WA 98944

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NOVEMBER 2022 GROUNDWATER MONITORING REPORT

Roza Irrigation District Property

125 S. 13TH STREET, SUNNYSIDE, WASHINGTON

SHANNON & WILSON

December 29, 2022

Shannon & Wilson No: 100500-005

Submitted To: Roza Irrigation District
125 S. 13th Street
Sunnyside, WA 98944
Attn: Mr. Wayne Sonnichsen

Subject: NOVEMBER 2022 GROUNDWATER MONITORING REPORT, ROZA IRRIGATION DISTRICT PROPERTY, 125 S. 13TH STREET, SUNNYSIDE, WASHINGTON

Shannon & Wilson prepared this report and participated in this project as a consultant to Roza Irrigation District under our Professional Services Agreement dated August 10, 2021. Our scope of services was specified in Task Order #001 Amendment dated March 11, 2022.

This report presents the findings of groundwater monitoring conducted during November 2022. This report was prepared by the undersigned.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or we may be of further service, please contact us.

Sincerely,

SHANNON & WILSON

RYAN BEAU PETERSON
STATE OF WASHINGTON
56673
REGISTERED
PROFESSIONAL ENGINEER

Ryan Peterson
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Date: 2022.12.29 12:18:54 -08'00'

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Scott W. Gaulke, PE, LHG
Vice President

RBP:SWG/rbp

EXECUTIVE SUMMARY

This report provides a summary of the findings from the November 2022 groundwater monitoring event at the Roza Irrigation District (RID) property located at 125 South 13th Street in Sunnyside, Washington (RID Property). RID uses the property for vehicle maintenance, storage, and office space. The RID Property is a listed Washington State Department of Ecology (Ecology) cleanup site and is enrolled in the Voluntary Cleanup Program (VCP).

Two releases have reportedly occurred on the RID Property, including a leaking diesel underground storage tank (UST) and a leaking belowground hydraulic hoist. The UST and impacted soil were excavated in the early 1990s and removed from the site. Diesel-impacted soil is believed to remain under the foundation of the Shop Building and was not excavated to prevent compromising the structural integrity of the building. A leaking belowground hoist was discovered in 2014 and replaced. The release was estimated to be 39 gallons. The release from the hoist was in the same area as diesel-impact soil from the former leaking UST.

Soil with concentrations of diesel and hydraulic oil are believed to remain under the Shop Building. A trace layer of light nonaqueous phase liquid (LNAPL) has been detected in monitoring wells in the immediate vicinity of the release areas. A groundwater plume with concentrations of diesel-range hydrocarbons and heavy oil-range hydrocarbons (cumulatively referred to as the groundwater diesel plume) has been detected to extend from the release areas.

This report provides the results of groundwater monitoring that occurred on November 29 and 30, 2022, at the RID Property. This is the third quarter of four planned quarterly monitoring events at the RID Property. The purpose of groundwater monitoring is to evaluate groundwater flow direction and evaluate for a stable or receding plume.

Depth to groundwater was measured at 11 wells on the property. A trace thickness (<0.01 foot) of LNAPL was observed at two of these wells in the vicinity of the historical releases. Groundwater samples were collected from MW-11 and MW-23 through MW-26. The groundwater samples were analyzed using method Northwest Total Petroleum Hydrocarbons-Diesel/Diesel Extended (NWTPH-Dx/Dx Ext.).

The concentration of total petroleum hydrocarbons as heavy oil-range (TPH-O) in the sample collected from MW-24 was 555 micrograms per liter (µg/L), which exceeded the Model Toxics Control Act Method A (MTCA-A) cleanup level of 500 µg/L. Samples

collected from MW-24 during the previous two quarters had TPH-O detected at 362 µg/L and 367 µg/L.

Based on the results from the November 2022 groundwater monitoring, the diesel groundwater plume appears to extend to at least MW-24. The downgradient extent of the plume does not appear to be defined in the direction of MW-24. The western boundary of the RID property is approximately 30 feet downgradient from MW-24.

Since the extent of the groundwater diesel plume does not appear to be bounded by the existing monitoring wells, we expect that the Department of Ecology will require continued monitoring beyond the currently planned final monitoring event of February 2023 along with additional monitoring well(s). In light of that, as the quickest way to closure, we suggest installing one or two monitoring wells downgradient of MW-24 and restarting four quarters of groundwater monitoring to evaluate if the plume extends off the RID Property.

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ACRONYMS

µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
APH	air-phase hydrocarbon
Ecology	Washington State Department of Ecology
EIM	Environmental Information Management
LNAPL	light nonaqueous phase liquid
MTCA-A	Model Toxics Control Act Method A
NWTPH-Dx/Dx Ext.	Northwest Total Petroleum Hydrocarbons-Diesel/Diesel Extended
PCS	petroleum-contaminated soil
RID	Roza Irrigation District
TPH	total petroleum hydrocarbons
TPH-D	total petroleum hydrocarbons as diesel-range
TPH-O	total petroleum hydrocarbons as heavy oil-range
UST	underground storage tank
VCP	Voluntary Cleanup Program

1 INTRODUCTION

This report includes a summary of methods, observations, and results of a groundwater monitoring event on November 29 and 30, 2022, at the Roza Irrigation District (RID) property located at 125 South 13th Street in Sunnyside, Washington (Figure 1) (RID Property). The RID Property is listed with Ecology) as Facility Site ID 534, Cleanup Site ID 4938, and VCP ID CE0492.

The RID Property is enrolled in Ecology's VCP to address a historical release of diesel from a former leaking UST and a historical release of hydraulic fluid from a belowground hoist.

1.1 Site Location and Description

RID uses the property for vehicle maintenance, storage, and office space. RID parks service vehicles and stores equipment for irrigation systems maintenance and repair on the property.

The property is relatively flat and has paved and gravel parking areas. The remainder of the property is covered by buildings. The building at the center of the property is referred to as the Shop Building. The building is used for vehicle maintenance and is the location of two releases of regulated substances.

1.2 Site Background

Two releases have reportedly occurred on the RID Property, including a leaking diesel UST and a leaking belowground hydraulic hoist.

1.2.1 1990 Leaking Diesel Underground Storage Tank

In 1990, three USTs storing diesel and gasoline, a pump island, and associated piping were removed from the north side of the Shop Building. A leak from piping connected to the diesel UST resulted in impacts to soil and groundwater. Petroleum-contaminated soil (PCS) was excavated from the UST basin to the extent practicable and PCS is believed to remain in place beneath the Shop Building (RID, 1993). The estimated extent of the excavation is shown in Figure 2.

Following excavation of PCS to the extent feasible, groundwater samples were collected at monitoring wells MW-9, MW-10, MW-11, and MW17 during approximately eight events from 1990 through 2003. Oil- and diesel-range hydrocarbons were not detected in excess of the MTCA-A cleanup levels of the time; however, some concentrations exceeded

present-day MTCA-A cleanup levels. Results from the last monitoring event of May 2003 had concentrations at less than the present-day MTCA-A cleanup level. Analytical results are tabulated in Table 1.

1.2.2 2014 Leaking Belowground Hydraulic Hoist

In November 2014, RID became aware of a hydraulic oil leak from a belowground automotive hoist located in the Shop Building's northeast corner. The release was estimated to be 39 gallons. The hoist was taken out of service as soon as the leak was detected and replaced with a new aboveground hoist approximately one month later. The release was in the same general area as the assumed location of PCS beneath the building from the former leaking diesel UST.

Shannon & Wilson completed four quarters of groundwater monitoring between September 2018 and July 2019 to evaluate the impacts to groundwater from historical releases of diesel fuel and hydraulic oil. A trace layer of LNAPL was observed on groundwater in three monitoring wells (MW-16, MW-17, and EW-18).

Groundwater samples were collected from available monitoring wells where no LNAPL was observed, including MW-10, MW-11, and MW-15. Total petroleum hydrocarbons as diesel-range (TPH-D) were detected at high concentrations inside the Shop Building (MW-15). However, concentrations of TPH-D were not detected above the MTCA-A cleanup levels in downgradient monitoring wells (MW-10 and MW-11).

Ecology issued an opinion letter in March 2021 stating that further action was needed at the RID Property (Ecology, 2021). Ecology requested additional monitoring wells be installed, surveyed, and sampled to further evaluate groundwater flow direction and whether the groundwater diesel plume is stable or receding, as well as sample sub-slab vapor under the portion of the Shop Building that overlies the source area.

In September 2021, Shannon & Wilson installed two new wells just outside of the estimated extent of the groundwater diesel plume (MW-22 and MW-23). TPH-D was detected in groundwater collected from the wells at greater than the MTCA-A cleanup level, indicating that the groundwater diesel plume extended farther downgradient from the wells. A summary of well completion details is provided in Table 2.

1.2.3 March 2022 Sub-Slab Soil Gas Investigation

On March 16, 2022, Shannon & Wilson sampled sub-slab soil gas to evaluate for potential impacts from the LNAPL plume. Sub-slab soil gas was sampled from monitoring point SV-1 located adjacent to MW-15 and MW-16 where trace LNAPL has been observed on

groundwater. The soil gas and ambient samples were analyzed for air-phase hydrocarbons (APHs) and benzene, toluene, ethylbenzene, xylenes, and naphthalene. APH and toluene were detected in the soil gas and ambient air samples.

- The summation of APHs as TPH were 1,110 micrograms per cubic meter (µg/m^3) and 640 µg/m^3 in the soil gas and ambient samples, respectively. The detected concentration was less than the Sub-slab Soil Gas Screening Level Method B Noncancer for TPH-Generic Cleanup Level of 4,700 µg/m^3.
- Toluene was detected in the soil gas and ambient air at 300 and 320 µg/m^3, respectively. The sub-slab concentration of toluene was less than the Sub-Slab Soil Gas Screening Level Method B Noncancer of 76,000 µg/m^3.

Based on these findings, the LNAPL plume appears to have a low potential to elevate concentrations of chemicals of concern in sub-slab soil gas and indoor air above regulatory criteria.

1.2.4 March, May 2022 Groundwater Investigation

In March 2022, Shannon & Wilson conducted an additional groundwater investigation and recommenced groundwater monitoring in May 2022 to further address Ecology's 2021 letter. On March 16, 2022, a direct-push probe rig was used to install monitoring wells MW-24, MW-25, and MW-26 that were downgradient of the groundwater diesel plume.

Monitoring wells outside of the estimated extent of the groundwater diesel plume were sampled in May 2022 and August 2022. The results from this groundwater sampling event indicated the groundwater diesel plume did not appear to extend off the RID Property and appeared to be bounded by downgradient wells MW-11, MW-24, MW-25, and MW-26.

The May and August 2022 monitoring events were the first and second of four planned quarterly monitoring events to collect data to evaluate if the groundwater diesel plume is stable or receding.

1.3 Purpose of the Report

This report provides the results from the November 2022 quarterly groundwater monitoring. The monitoring event was the third of four planned quarterly monitoring events to collect data to evaluate if the groundwater diesel plume is stable or receding.

2 SITE GEOLOGY AND HYDROGEOLOGY

This section describes the general geologic setting and discusses subsurface conditions beneath the RID Property and surrounding area as they relate to the potential for contamination to migrate through the soil and groundwater.

2.1 Geology

The vicinity of the RID Property is located in a wide lowland known as the Columbia Basin. The Columbia Basin is characterized by steep river canyons, extensive plateaus, and tall ridges. The area is overlain with windblown sediment (loess) and deposits from glacial floods, which most recently occurred approximately 14,000 years ago, and is underlain by basalt lava flows (Washington State Department of Natural Resources, 2022).

The RID Property is covered with pavement, gravel parking areas, and buildings. Based on borings advanced during 2021 and 2022 in the south portion of the property, the gravel parking area appears to be underlain by approximately 6 inches of angular gravel. Silty sand was encountered under the base course at up to the total depth of the borings (15 feet depth) (Shannon & Wilson, 2021 and 2022).

2.2 Hydrogeography

Numerous drainages (creeks, irrigation canals, and ditches) in the vicinity appear to be aligned in the south to southwest direction, consistent with the topographic downslope. The Yakima River is located approximately 5 miles to the southwest.

Monitoring of groundwater on the RID Property was most recently conducted during November 2022 using site monitoring wells. Based on the monitoring events, the groundwater gradient appears to be towards the south to southwest and is shown in Figure 3. The south-southwest gradient is consistent with the distribution of detected contamination related to historic releases. Historically estimated groundwater gradients are listed in Exhibit 2-1.

Exhibit 2-1: Historical Estimated Groundwater Gradient

Monitoring Date	Inferred Groundwater Gradient
9/25/2018	Southeast
1/10/2019	South
4/2/2019	Not Calculated
7/1/2019	Southeast
10/15/2021	South-Southwest
5/23/2022	South-Southwest
8/24/2022	South-Southwest
11/29/2022	South-Southwest

3 QUARTERLY GROUNDWATER MONITORING

This section presents the findings from the November 2022 monitoring event. The purpose of groundwater monitoring is to evaluate groundwater flow direction and evaluate for a stable or receding plume.

Quarterly groundwater monitoring was conducted on November 29 and 30, 2022, and included measuring groundwater levels and collecting groundwater samples at monitoring wells. The following sections discuss groundwater monitoring activities and findings. A more detailed discussion of field methods is provided in Appendix A.

3.1 Groundwater Level Measurements

The groundwater elevation was measured in monitoring wells on November 29, 2022, to evaluate for the groundwater gradient at the RID Property.

First, a plastic bailer was used to measure LNAPL in monitoring wells. Trace LNAPL (< 0.01 foot) was observed at MW-15 and EW-18. Afterwards, the depth to groundwater was measured at monitoring wells. A summary of current and historical LNAPL measurements and groundwater level measurements is provided in Tables 5 and 6, respectively.

Groundwater elevations are plotted in Figure 3. Based on the elevations, the apparent groundwater gradient on November 29, 2022, was to the south and southwest.

Based on measurements of groundwater levels during the November 2022 sampling event and previous two quarters, the groundwater levels, gradient, and direction do not appear to have changed significantly. Groundwater levels at individual monitoring wells varied by

less than 1 foot during the three measuring events. The potentiometric surface between wells appears to be fairly consistent in direction and gradient.

3.2 Groundwater Sampling

The sampled monitoring wells were MW-11 and MW-23 through MW-26. Well purging data was recorded on a Water Sampling Log and final parameters are provided in Table 3. The groundwater samples were analyzed using method NWTPH-Dx/Dx Ext. The detected analytes were less than the MTCA-A cleanup level, except for the sample collected from MW-24. Analytical results are tabulated in Table 4 and displayed in Figure 4. The laboratory report is provided in Appendix B.

TPH-O were detected at increased concentrations at four of the five wells sampled during November 2022, compared to the concentrations detected in the previous quarter. TPH-D were not detected in samples collected from MW-24 during the November 2022 sampling event or the previous two quarters.

The concentration of TPH-O in the sample collected from MW-24 was 555 µg/L, which exceeded the MTCA-A cleanup level of 500 µg/L. Samples collected from MW-24 during the previous two quarters had TPH-O detected at 362 µg/L and 367 µg/L.

4 ENVIRONMENTAL INFORMATION MANAGEMENT SYSTEM

Analytical results were submitted to Ecology's Environmental Information Management (EIM) System on December 28, 2022, and are pending review by the EIM data coordinator.

5 CONCLUSIONS

Based on the results from the November 2022 groundwater monitoring, the diesel groundwater plume appears to extend to at least MW-24. The downgradient extent of the plume does not appear to be defined in the direction of MW-24. The western boundary of the RID property is approximately 30 feet downgradient from MW-24.

Since the extent of the groundwater diesel plume does not appear to be bounded by the existing monitoring wells, we expect that the Department of Ecology will require continued monitoring beyond the currently planned final monitoring event of February 2023 along with additional monitoring well(s). In light of that, as the quickest way to closure, we

suggest installing one or two monitoring wells downgradient of MW-24 and restarting four quarters of groundwater monitoring to evaluate if the plume extends off the RID Property.

6 LIMITATIONS

This letter was prepared for the exclusive use of the RID, and in no way guarantees that any agency or its staff will reach the same conclusions as Shannon & Wilson. Shannon & Wilson has prepared the enclosed, "Important Information About Your Environmental Site Assessment/Evaluation Report," to assist you and others in understanding our report.

7 REFERENCES

Roza Irrigation District (RID), 1993, Progress Report of LUST Clean-up: Letter prepared by Rosa Irrigation District, Sunnyside, Wash., and submitted to Washington State Department of Ecology, Yakima, Wash, January 4.

Shannon & Wilson, 2021, Results of the fifth groundwater sampling event, Roza Irrigation District, 125 South 13th Street, Sunnyside, Washington: Report prepared by Shannon & Wilson, Inc., Seattle, Wash., 100500-005, for Roza Irrigation District, Sunnyside, Wash., December 2.

Shannon & Wilson, 2022, Groundwater and sub-slab soil gas investigations report, Roza, Roza Irrigation District Property, 125 S. 13th Street, Sunnyside, Washington: Report prepared by Shannon & Wilson, Inc., Seattle, Wash., 100500-005, for Roza Irrigation District, Sunnyside, Wash., June 10.

Washington State Department of Ecology (Ecology), 2021, Further action needed at the following site: site name: Roza Irrigation District, site address: 125 South 13th Street, Sunnyside, facility/site no.: 534, cleanup site ID: 4938, VCP no.: CE0492: Letter prepared by Washington State Department of Ecology, Toxics Cleanup Program, March 9, available: https://apps.ecology.wa.gov/gsp/CleanupSiteDocuments.aspx?csid=4938.

Washington State Department of Natural Resources, 2022, Geologic provinces, Columbia Basin: Olympia, Wash., Washington State Department of Natural Resources, available: https://www.dnr.wa.gov/programs-and-services/geology/explore-popular-geology/geologic-provinces-washington/columbia-basin, accessed June 3.

Table 1: Historical Groundwater Analytical Results (1990 to 2003)

Well ID	Sample Number	Sample Date	Petroleum (ug/L)			BTEX (µg/L)				Total Metals (µg/L)
			Oil	Diesel	Gasoline	Benzene	Toluene	Ethylbenzene	Xylenes	Lead
MW-9	1	8/28/1990	< 10,000	—	< 5,000	< 1	< 1	< 1	< 1	< 50
	RID-0291-7	10/24/1991	< 0.01	—	—	< 1	< 1	< 1	< 1	—
	RID-0291-209	11/3/1999	**1,800**	**390**	ND	ND	**1.9**	ND	ND	—
	191-001-309	5/24/2000	ND	ND	ND	ND	ND	ND	ND	—
	191-001-009	11/16/2000	ND	ND	ND	ND	ND	ND	ND	—
	191-001-409	5/8/2003	< 470	< 290 Y	< 100	< 1	< 1	< 1	< 1	—
MW-10	2	8/28/1990	< 10,000	—	< 5,000	< 1	< 1	< 1	< 1	< 50
	#0910-15	2/11/1991	< 10	—	—	< 1.0	< 1.0	< 1.0	< 1.0	—
	RID-0291-8	10/24/1991	< 10	—	—	< 1	< 1	< 1	< 1	—
	RID-0391-18	8/10/1992	—	—	—	< 1	< 1	< 1	< 1	—
	RID-0291-210	11/3/1999	ND	ND	ND	ND	**5.2**	ND	**1.6**	—
	191-001-310	5/24/2000	ND	ND	ND	ND	ND	ND	ND	—
	191-001-010	11/16/2000	ND	ND	ND	ND	ND	ND	ND	—
	191-001-410	5/8/2003	< 450	< 280	< 100	< 1	< 1	< 1	< 1	—
MW-11	3	8/28/1990	< 10	—	< 5,000	< 1	**49**	< 1	< 1	< 50
	#0191-16	2/11/1991	< 10	—	—	< 1.0	< 1.0	< 1.0	< 1.0	—
	RID-0391-19	8/10/1992	—	—	—	< 1	< 1	< 1	< 1	—
	191-001-011	11/3/1999	ND	ND	ND	ND	ND	ND	ND	—
	RID-2091-211	5/24/2000	**770**	ND	ND	ND	**3.5**	ND	**1.4**	—
	191-001-311	11/16/2000	ND	ND	ND	ND	ND	ND	ND	—
	191-001-411	5/8/2003	< 470	< 290	< 100	< 1	< 1	< 1	< 1	—
MW-17	#0191-17	2/11/1991	—	**30**	—	< 1.0	< 1.0	< 1.0	< 1.0	—
	RID-0291-9	10/24/1991	< 10	--	—	< 1	< 1	< 1	< 1	—
	RID-0391-20	8/10/1992	—	—	—	< 1	< 1	< 1	< 1	—
	RID-0291-217	11/3/1999	**1,000**	**1,100**	**100**	ND	**3.9**	ND	**3.3**	—
	191-001-317	5/24/2000	ND	ND	ND	ND	ND	ND	ND	—
	191-001-017	11/16/2000	**580**	ND	ND	ND	ND	ND	ND	—
	191-001-417	5/8/2003	< 460	< 290	< 100	< 1	< 1	< 1	< 1	—
	Current MCTA-A Cleanup Levels		500	500	1,000	5	1,000	700	1,000	15

NOTES:
Bold text indicates a detected analyte.
Shaded cells indicate a detection greater than the current MTCA Method A cleanup criteria.
< = less than; -- = not tested; BTEX = benzene, toluene, ethylbenzene, and xylenes; µg/L = micrograms per liter; MTCA-A = Model Toxics Control Act Method A; ND = not detected, unable to identify the method reporting limit based on available site information; Y = sample extract treated with a silica gel cleanup procedure

Table 2: Well Completion Details

Well ID	Ecology Tag	Installation Date	Status as of Nov 29, 2022	Northing	Easting	Elevation of Ground Surface (feet)	Elevation of TOC (feet)	Top of Screen Depth (feet bgs)	Bottom of Screen Depth (feet bgs)	Casing Diameter (inches)
Groundwater Monitoring Wells										
MW-10	-	10/24/90	Accessible / Active	362804.94	1765679.49	753.76	753.77	7	12	2
MW-11	-	10/24/90	Accessible / Active	362867.73	1765715.61	754.38	754.47	7	12	2
MW-15	-	10/24/90	Accessible / Active	362897.04	1765684.69	754.16	754.16	7	12	2
MW-16	-	10/24/90	Accessible / Active	362883.65	1765685.84	754.19	754.15	7	12	2
MW-17	-	10/24/90	Accessible / Active	362872.69	1765689.12	754.19	754.15	7	12	2
MW-22	BLC-811	09/08/21	Accessible / Active	362804.92	1765651.54	754.02	754.01	5	15	3/4
MW-23	BLC-812	09/08/21	Accessible / Active	362804.92	1765708.88	753.63	753.66	5	15	3/4
MW-24	BPK-251	05/19/22	Accessible / Active	362762.06	1765602.57	754.19	753.95	5	15	3/4
MW-25	BPK-252	05/19/22	Accessible / Active	362725.03	1765637.18	753.78	753.34	5	15	3/4
MW-26	BPK-253	05/19/22	Accessible / Active	362740.68	1765692.10	753.50	753.11	5	15	3/4
Sub-Slab Soil Vapor Point										
SV-1	-	09/08/21	Accessible / Active	362900.04 [a]	1765683.69 *	754.16	-	0.5	0.5	-
LNAPL Extraction Well										
EW-18	-	Prior to 1993[b]	Accessible / Active	362917.55	1765693.03	754.23	754.02	unknown	unknown	12

NOTES:
Northings and eastings and elevation data by Gray Surveying & Engineering, Inc. of Yakima, Washington. Horizontal datum is State Plane of Washington Coordinate System of 1983, WA-S Zone, U.S. Survey Feet. Vertical datum is North American Vertical Datum (NAVD 88).

a The location of SV-1 is based on measurements from the surveyed location of MW-15.

b The exact date of installation of EW-18 is not known. EW-18 was installed sometime prior to 1993 since it was reported as being pumped in a report dated January 4, 1993: Roza Irrigation District, 1993, Progress Report for LUST Clean-up: Report prepared by Roza irrigation District, Sunnyside, Wash., and submitted to Washington State Department of Ecology, Yakima, Wash., January 4.

bgs = below ground surface; LNAPL = light nonaqueous phase liquid; TOC = top of casing

Table 3: Water Quality Parameters Prior to Sampling (2018 to Present)

Well ID	Date	Temperature (°C)	Oxidation-Reduction Potential (mV)	pH	Specific Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Total Dissolved Solids (g/L)	Color
MW-10	9/26/2018	21.90	590.4	7.52	1.111	2.11	188	0.7215	Clear/brown
	1/10/2019	14.79	57.8	-	1.092	2.92	4.56	0.710	Clear
	4/3/2019	14.66	155.8	7.47	0.978	5.00	14.5	0.635	Clear
	7/2/2019	18.90	1028.3	7.49	1.125	1.91	35.7	0.731	Clear
	9/28/2021	21.60	223.7	7.04	1.420	3.02	-	0.923	Clear
MW-11	9/26/2018	20.30	863.7	7.81	1.004	5.43	800	0.637	Brown
	1/10/2019	13.15	54.0	-	1.062	5.00	54	0.692	Clear
	4/3/2019	14.41	65.1	7.75	0.843	2.38	31.2	0.548	Clear
	7/2/2019	19.20	1000.4	7.65	1.091	2.86	61	0.7085	Clear
	9/28/2021 [a]	19.82	218.4	7.17	1.454	4.79	7.38	0.945	Clear
	5/26/2022 [a]	15.75	202.9	7.41	1.194	7.43	-	0.776	Clear
	8/25/2022 [b]	-	-	-	-	-	-	-	Clear
	11/30/2022 [a]	15.14	169.3	7.6	1.864	3.01	4.25	1.212	Clear
MW-22	9/28/2021	19.48	223.6	6.83	1.887	1.82	2.29	1.226	Clear
MW-23	9/28/2021	20.57	227.0	9.79	0.812	4.39	1.27	0.528	Clear
	5/25/2022	18.05	204.5	7.48	1.504	0.29	3.52	0.978	Clear
	8/24/2022	22.14	258.7	7.26	0.926	0.52	15.80	0.602	Clear
	11/29/2022	14.20	175.9	7.38	1.905	0.53	14.10	1.238	Clear
MW-24	5/25/2022	16.53	204.0	7.32	1.280	0.48	3.19	0.832	Clear
	8/25/2022	19.86	236.2	7.60	1.139	0.67	2.58	0.741	Clear
	11/30/2022	14.00	175.5	7.39	2.036	0.55	6.99	1.324	Clear
MW-25	5/26/2022	16.64	205.1	7.00	1.289	0.6	2.93	0.838	Clear
	8/25/2022	19.04	225.9	7.45	1.110	0.57	4.06	0.721	Clear
	11/30/2022	13.75	174.3	7.35	1.999	1.3	0.87	1.299	Clear
MW-26	5/25/2022	16.01	206.7	6.99	1.349	0.88	6.58	0.877	Clear
	8/24/2022	20.38	248.4	6.95	1.148	0.92	10.80	0.746	Clear
	11/29/2022	12.47	182.3	7.22	2.071	0.83	9.23	1.346	Clear

NOTES:

Light-blue shading data was collected during most recent monitoring event of November 2022.

Parameters represent the groundwater conditions closest to the time of sampling. Wells were sampled after stabilization, or after three well volumes were purged.

[a] Parameters do not represent stabilization; due to poor well recharge three well volumes were purge prior to sampling. Parameters are reported prior to sampling.

[b] Parameters not collected due to well's history of poor recharge; well was purged until dry three times to satisfy criteria of purging three well volumes prior to sampling.

°C = degrees Celsius; g/L = grams per liter; µS/cm = microSiemens per centimeter; mg/L = milligrams per liter; mV = millivolts; NTU -= nephelometric turbidity unit

Table 4: Groundwater Analytical Results (2018 to Present)

Well ID	Sample Number	Sample Date	Petroleum (µg/L)			BTEX (µg/L)				
			Diesel (Fuel Oil)	Heavy Oil	Gasoline	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene
MW-10	MW-10-09262018	9/26/2018	< 49.8	< 99.6	< 50.0	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
	MW-10-01102019	1/10/2019	< 50.2	< 100	NA	NA	NA	NA	NA	NA
	MW-10-04032019	4/3/2019	< 50.3	< 101	NA	NA	NA	NA	NA	NA
	MW-10-07022019	7/2/2019	69.8	129	NA	NA	NA	NA	NA	NA
	MW-100-07022019 (duplicate sample)	7/2/2019	< 49.6	142	NA	NA	NA	NA	NA	NA
	MW-10-09282021	9/28/2021	< 99.1	< 99.1	NA	NA	NA	NA	NA	NA
MW-11	MW-11-09262018	9/26/2018	53.8 *	< 100	< 50.0	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
	MW-11-01092019	1/9/2019	< 50.2	< 100	NA	NA	NA	NA	NA	NA
	MW-100-01092019 (duplicate sample)	1/9/2019	< 50.2	< 100	NA	NA	NA	NA	NA	NA
	MW-11-04022019	4/2/2019	< 50.2	< 100	NA	NA	NA	NA	NA	NA
	MW-11-07022019	7/2/2019	< 50.1	< 100	NA	NA	NA	NA	NA	NA
	MW-11-09282021	9/28/2021	< 125	< 125	NA	NA	NA	NA	NA	NA
	MW-11-05262022	5/26/2022	< 94.1	< 94.1	NA	NA	NA	NA	NA	NA
	MW-11-082522	8/25/2022	< 94.3	199	NA	NA	NA	NA	NA	NA
	MW-11-113022	11/30/2022	< 97	179	NA	NA	NA	NA	NA	NA
MW-15	MW-15-09262018	9/26/2018	95,100 D	< 100	< 50.0	< 1.00	< 1.00	< 1.00	< 1.00	1.06
	MW-100-09262018 (duplicate sample)	9/26/2018	88,600 D	< 100	< 50.0	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
	MW-15-01102019	1/10/2019	3,400	< 99.4	NA	NA	NA	NA	NA	NA
	MW-15-04022019	4/2/2019	5,590 D	< 99.2	NA	NA	NA	NA	NA	NA
	MW-100-04022019 (duplicate sample)	4/2/2019	485,000 D	< 998 D	NA	NA	NA	NA	NA	NA
	MW-15-07022019	7/2/2019	3,470	< 99.8	NA	NA	NA	NA	NA	NA
MW-22	MW-22-09282021	9/28/2021	1,330	< 99.5	NA	NA	NA	NA	NA	NA
MW-23	MW-23-09282021	9/28/2021	1,500	< 99.5	NA	NA	NA	NA	NA	NA
	MW-23-05262022	5/26/2022	< 93.3	217 B	NA	NA	NA	NA	NA	NA
	MW-100-05262022 (duplicate sample)	5/26/2022	< 96.2	211 B	NA	NA	NA	NA	NA	NA
	MW-23-082422	8/24/2022	< 93.0	229	NA	NA	NA	NA	NA	NA
	MW-23-112922	11/29/2022	< 96.9	259	NA	NA	NA	NA	NA	NA
MW-24	MW-24-05262022	5/26/2022	< 92.6	367 B	NA	NA	NA	NA	NA	NA
	MW-24-082522	8/25/2022	< 93.7	362	NA	NA	NA	NA	NA	NA
	MW-24-113022	11/30/2022	< 93.7	555	NA	NA	NA	NA	NA	NA
MW-25	MW-25-05262022	5/26/2022	110	225 B	NA	NA	NA	NA	NA	NA
	MW-25-0825222	8/25/2022	< 94.2	209	NA	NA	NA	NA	NA	NA
	MW-25-113022	11/30/2022	< 94.2	261	NA	NA	NA	NA	NA	NA
MW-26	MW-26-05262022	5/26/2022	< 93.3	180 B	NA	NA	NA	NA	NA	NA
	MW-100-082422 (duplicate sample)	8/24/2022	< 94.1	434	NA	NA	NA	NA	NA	NA
	MW-26-082422	8/24/2022	< 93.5	159	NA	NA	NA	NA	NA	NA
	MW-100-112922 (duplicate sample)	11/29/2022	< 95.6	198	NA	NA	NA	NA	NA	NA
	MW-26-112922	11/29/2022	< 96.1	139	NA	NA	NA	NA	NA	NA
	MTCA Method A		500	500	1,000	5	1,000	700	1,000	

NOTES:

Bold text indicates a detected analyte.

* = Lab reported the result as "Diesel (C12-C24)"

Light-blue shading data was collected during most recent monitoring event of November 2022.

Tan-shaded cells indicate a detection greater than MTCA Method A cleanup criteria.

< = less than; -- = constituent not reported; B = analyte detected in the associated method blank; BTEX = benzene, toluene, ethylbenzene, and xylenes; D = dilution was required; µg/L = micrograms per liter; MTCA = Model Toxics Control Act; NA = not analyzed

Table 5: LNAPL Measurements

Well ID	Date	Measured LNAPL Thickness (ft)
MW-15	9/25/2018	Not Detected
	1/10/2019	Not Detected
	4/2/2019	Trace
	7/1/2019	Trace
	9/28/2021	Trace
	5/23/2022	Trace
	8/24/2022	Trace
	11/29/2022	Trace
MW-16	9/25/2018	0.01
	1/10/2019	0.01
	4/2/2019	Trace
	7/1/2019	Trace
	9/28/2021	Trace
	5/23/2022	Trace
	8/24/2022	Trace
	11/29/2022	Not Detected
MW-17	9/25/2018	Trace
	1/10/2019	Trace
	4/2/2019	Trace
	7/1/2019	Trace
	9/28/2021	Not Detected
	5/23/2022	Not Detected
	8/24/2022	Not Detected
	11/29/2022	Not Detected
EW-18	9/25/2018	0.01
	8/25/2022	Trace
	11/29/2022	Trace

NOTES:
Light-blue shading data was collected during most recent monitoring event of November 2022.
ft = feet; LNAPL = light nonaqueous phase liquid; Trace = less than 0.01 foot of LNAPL was measured

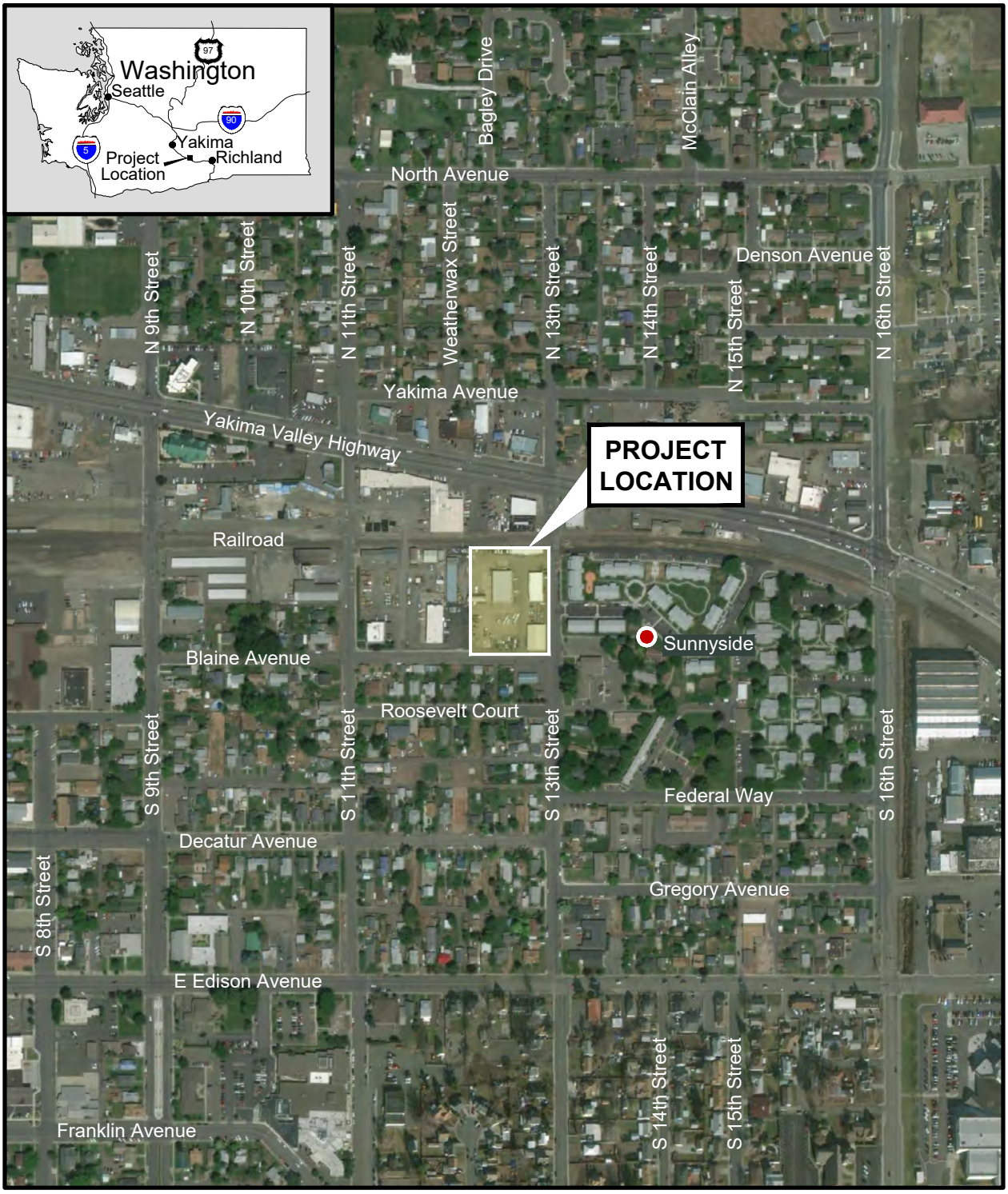
Table 6: Groundwater Level Measurements

Well ID	Screened Interval (feet bgs)	TOC Elevation	Date	Depth to Water (ft below TOC)	Groundwater Elevation (ft NAVD88)
MW-10	7 to 12	753.77	9/25/2018	10.38	743.39
			1/10/2019	9.50	744.27
			7/1/2019	9.90	743.87
			10/15/2021	10.36	743.41
			5/23/2022	9.56	744.21
			8/24/2022	10.51	743.26
			11/29/2022	9.89	743.88
MW-11	7 to 12	754.47	9/25/2018	10.80	743.67
			1/10/2019	9.90	744.57
			7/1/2019	10.29	744.18
			10/15/2021	10.79	743.68
			5/23/2022	10.01	744.46
			8/24/2022	10.93	743.54
			11/29/2022	10.32	744.15
MW-15	7 to 12	754.16	9/25/2018	10.40	743.76
			1/10/2019	9.52	744.64
			7/1/2019	9.90	744.26
			10/15/2021	10.33	743.83
			5/23/2022	9.59	744.57
			8/24/2022	10.48	743.68
			11/29/2022	9.92	744.24
MW-16	7 to 12	754.15	9/25/2018	10.44	743.71
			1/10/2019	9.56	744.59
			10/15/2021	10.38	743.77
			5/23/2022	9.66	744.49
			8/24/2022	10.53	743.62
			11/29/2022	9.95	744.2
MW-17	7 to 12	754.15	9/25/2018	10.47	743.68
			1/10/2019	9.60	744.55
			10/15/2021	10.42	743.73
			5/23/2022	9.69	744.46
			8/24/2022	10.6	743.55
			11/29/2022	9.98	744.17
MW-22	5 to 15	754.01	10/15/2021	10.44	743.57
			5/23/2022	9.65	744.36
			8/24/2022	10.59	743.42
			11/29/2022	9.96	744.05
MW-23	5 to 15	753.66	10/15/2021	9.77	743.89
			5/23/2022	8.96	744.7
			8/24/2022	9.91	743.75
			11/29/2022	9.28	744.38
MW-24	5 to 15	753.95	5/23/2022	10.14	743.81
			8/24/2022	11.1	742.85
			11/29/2022	10.45	743.50
MW-25	5 to 15	753.34	5/23/2022	9.64	743.70
			8/25/2022	10.68	742.66
			11/29/2022	9.97	743.37

Table 6: Groundwater Level Measurements

Well ID	Screened Interval (feet bgs)	TOC Elevation	Date	Depth to Water (ft below TOC)	Groundwater Elevation (ft NAVD88)
MW-26	5 to 15	753.11	5/23/2022	9.15	743.96
			8/24/2022	10.13	742.98
			11/29/2022	9.47	743.64
EW-18 (also known as MW-18)	unknown	754.02	9/25/2018	10.19	743.83
			8/25/2022	10.28	743.74
			11/29/2022	9.72	744.3

NOTES:
Groundwater elevations are corrected for measured LNAPL thickness.
Light-blue shading data was collected during most recent monitoring event of November 2022.
ft = feet; NAVD88 = North American Vertical Datum 1988; TOC = top of casing



0 500 1000

Approximate Scale in Feet

Roza Irrigation District
125 S 13th Street
Sunnyside, Washington

VICINITY MAP

December 2022 100500-005

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1

Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_SEA\100500\005\2022 4th Quarter\100500-005 Vicinity Map.dwg Date: 12-19-2022 Login: JRS

0 60 120

Approximate Scale in Feet

LEGEND

MW-10 Monitoring Well Designation and Surveyed Location

MW-9 Destroyed or Decommissioned Monitoring Well Designation and Approximate Location

SV-1 Vapor Pin Designation and Approximate Location

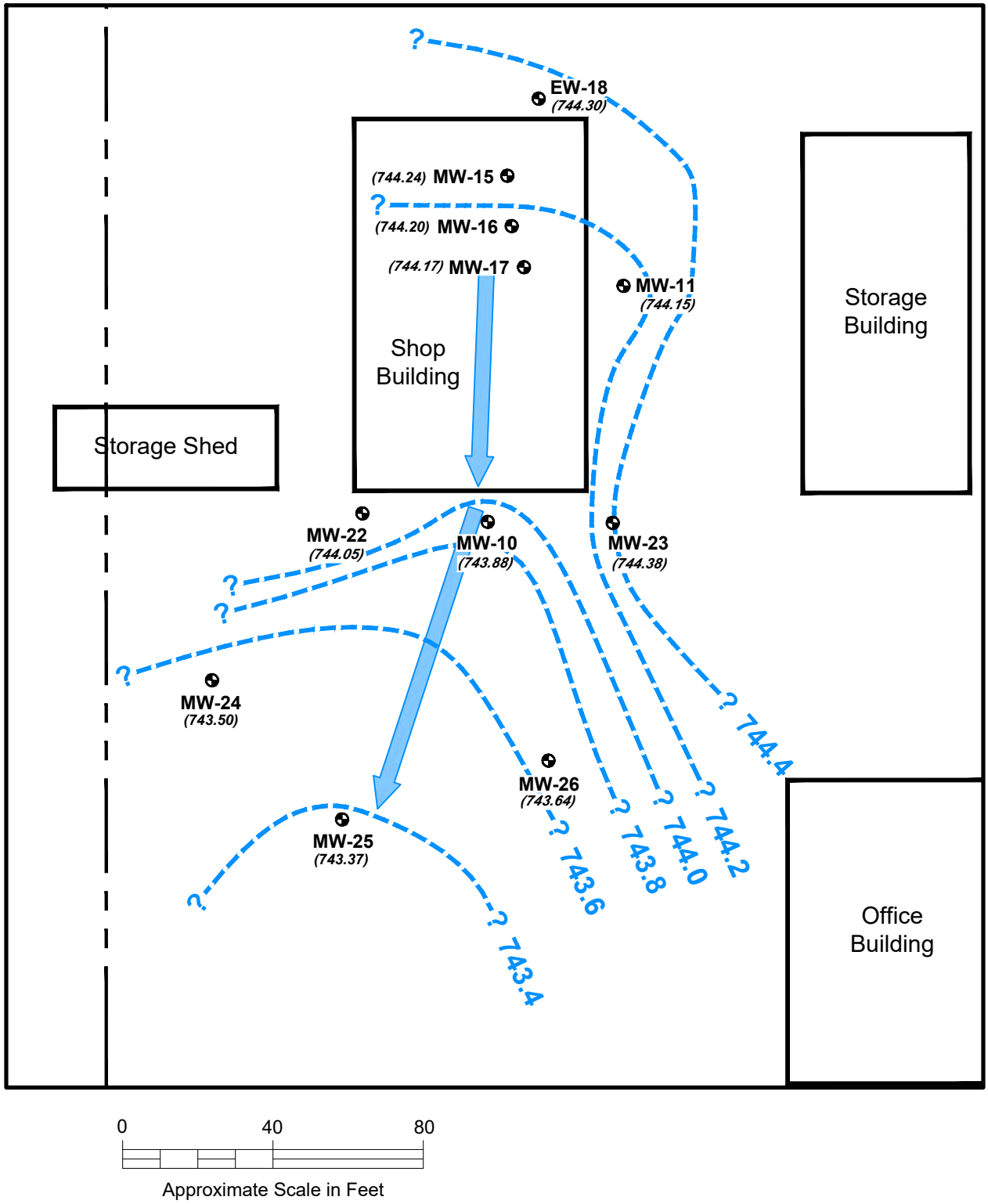
Roza Irrigation District
125 S 13th Street
Sunnyside, Washington

APPROXIMATE RELEASE AREAS AND HISTORICAL MONITORING WELLS

December 2022 100500-005

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 2



LEGEND

MW-10 (743.38) Monitoring Well Designation and Approximate Location with Groundwater Elevation in Feet on August 2022

743.4 Approximate Groundwater Contour Elevation in Feet

Approximate Groundwater Gradient Based on November 2022 Monitoring

Roza Irrigation District
125 S 13th Street
Sunnyside, Washington

POTENTIOMETRIC SURFACE MAP NOVEMBER 2022

December 2022 100500-005

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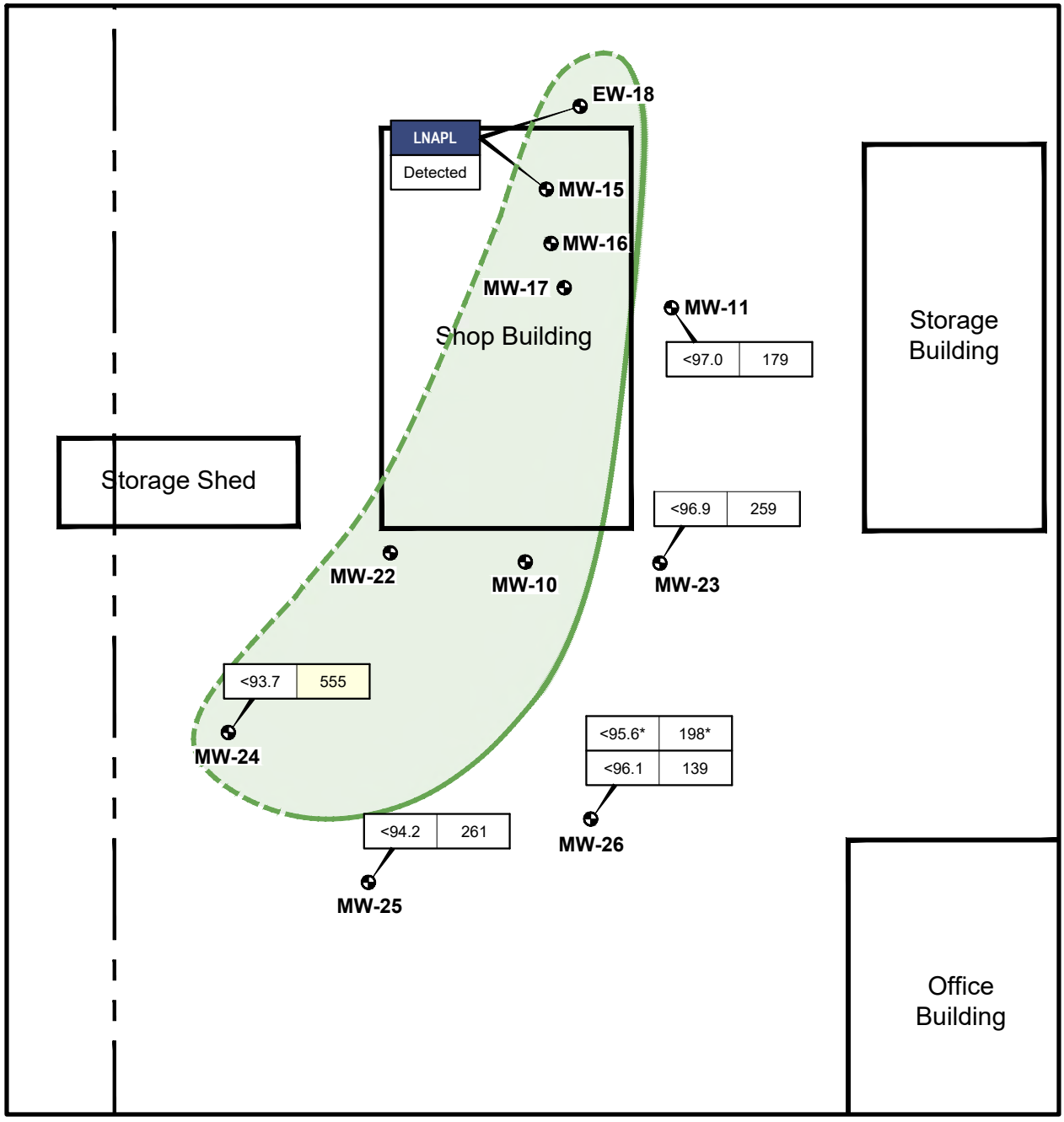
FIG. 3

Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_SEA\100500\005\2022 4th Quarter\100500-005 Potentiometric.dwg Date: 12-20-2022 Login: JRS



LEGEND

MW-10 Monitoring Well Designation and Approximate Location

LNAPL — Light Non-Aqueous Phase Liquid

555 — Exceeds the MTCA-A Cleanup Level

Estimated Extent of the Groundwater Diesel Plume

TABLE EXPLANATION

	Diesel (Fuel Oil)	Heavy Oil
MTCA-A Cleanup Level	500 ug/L	500 ug/L

NOTES

Results reported in micrograms per liter (µg/L).

* = Duplicate Sample

0 40 80

Approximate Scale in Feet

Roza Irrigation District
125 S 13th Street
Sunnyside, Washington

GROUNDWATER MONITORING RESULTS NOVEMBER 2022

December 2022 100500-005

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 4

Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_SEA\100500\005\2022 4th Quarter\100500-005 GW Monitoring.dwg Date: 12-21-2022 Login: JRS

APPENDIX A: FIELD METHODS

Appendix A

Field Methods

CONTENTS

APPENDIX A: FIELD METHODS

A.1 INTRODUCTION

This document describes procedures and observations for field activities during the November 2022 groundwater monitoring event at the Roza Irrigation District (RID) property. Procedures were completed in accordance with Shannon & Wilson's standard operating guidelines.

Field methods and observations are described in the following sections.

A.2 HEALTH AND SAFETY

A site-specific Health and Safety Plan (HASP) was prepared consistent with the requirements of the Washington State Division of Occupational Safety and Health Hazardous Waste Operations Regulation (Washington Administrative Code 296 843). The HASP included a description of the project team, the scope of work, site control, site hazard information, site hazard control, air monitoring, and emergency response. Information about the nearest hospital, including a map, was also included.

A.3 STATUS OF MONITORING WELLS

The monitoring wells on the RID property were examined for accessibility prior to sampling activities. The monitoring wells were observed to be accessible for sampling.

A.4 GROUNDWATER SAMPLING FROM MONITORING WELLS

Groundwater sampling was conducted on November 29 and 30, 2022, in accordance with U.S. Environmental Protection Agency (EPA) Low Stress Purging and Sampling Procedure.[1] A peristaltic pump was used for purging and sampling. The typical sampling procedure at each monitoring well was as follows.

1. New (disposable) tubing was slowly lowered into the well until the intake was placed approximately mid-screen and at least 2 to 3 feet below the water table.
2. Pumping rates were measured with a stopwatch and container of known volume to adjust the flow rate to between 150 milliliters per minute (mL/min) and 1 liter per

[1] U.S. Environmental Protection Agency (EPA), 2017, Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells: Report prepared by EPA, Region 1, North Chelmsford, Mass., revised September 19, available: https://www.epa.gov/sites/production/files/2017-10/documents/eqasop-gw4.pdf

minute. The water level was measured, and field parameters were recorded approximately every 3 to 5 minutes. The pumping rate was adjusted to maintain a steady water level. If possible, a drawdown of 0.3 foot or less was targeted. The pumping rate was lowered to a minimum of 150 mL/min if necessary, to maintain the desired drawdown.

3. Field parameters, including pH, specific conductivity, temperature, dissolved oxygen, Oxidation-Reduction Potential, turbidity, salinity, and total dissolved solids, were measured using a YSI 556 approximately every three to five minutes during purging.
4. Samples were collected when the water quality stabilization criteria were met. Water quality parameters were considered to have stabilized when at least three consecutive readings were within a specified tolerance from each other. The following criteria was monitored for stabilization:
    a. Turbidity (10% for values greater than 5 nephelometric turbidity units (NTUs); if three turbidity values are less than 5 NTUs, consider the values as stabilized);
    b. Dissolved Oxygen (10% for values greater than 0.5 milligram per liter (mg/L), if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized);
    c. Specific Conductance (3%);
    d. Temperature (3%);
    e. pH (± 0.1 unit); and
    f. Oxidation/Reduction Potential (±10 millivolts).
5. A groundwater sample was collected if field parameters did not stabilize after at three well volumes were purged. Well purging data was recorded on a Water Sampling Log and final parameters are provide in Table 4 of the main report.
6. If the well yield was poor and the water level dropped to the level of the intake, the pump was stopped until the water level recovered to near the pre-pumping level. The process was repeated until the field parameters stabilized. All measured water levels and pumping rate changes were recorded on water sampling logs.
7. Upon completion of purging and parameter stabilization, samples were collected from the discharge end of the pump tubing into the laboratory supplied containers. Sample containers were filled in order from most to least volatile analytes. Sample handling and field quality assurance (QA) sample collection procedures are outlined within Section A.8.

A.5 FIELD QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

Field QA/quality control procedures, discussed below, were established to ensure that samples can be tracked from collection through analysis, evaluate the efficiency and

reproducibility of sampling procedures, and ensure that sampling activities do not result in cross-contamination.

A.5.1 Equipment Decontamination

Non-disposable and non-dedicated sampling and monitoring equipment was decontaminated prior to initial use, between sampling locations, and at the completion of the sampling. The procedure included:

- Tap water initial rinse (if needed),
- Tap water and non-phosphate detergent (Alconox™) mixture wash,
- Tap water rinse,
- Deionized or distilled water rinse, and
- Deionized or distilled water final rinse.

A.5.2 Sample Labeling

Sample container labels were completed immediately before or immediately following sample collection. Labels were completed using indelible ink. At a minimum, container labels included the following information:

- Date and time of collection,
- Location of the sample,
- Name or initials of sample collector,
- Unique sample identification,
- Analysis requested, and
- Chemical preservative used.

A.5.3 Sample Transportation

Groundwater samples were transported to the analytical laboratory within a cooler containing ice to ensure that samples were maintained within the appropriate temperature range (between 0 degree Celsius [°C] and 6°C).

Samples were shipped via FedEx to Fremont Analytical of Seattle, Washington.

A.5.4 Chain-of-Custody

Sample information was entered onto a chain-of-custody (COC) form along with the requested analyses. Upon transfer of sample possession to subsequent parties, the COC form was signed and timestamped by the person(s) transferring and receiving custody of

the sample container. Upon receipt of samples at the laboratory, the condition of the samples was recorded by the receiver. COC records are included in the analytical report prepared by the laboratory.

A.6 INVESTIGATION-DERIVED WASTE

Purge and rinse water generated during the field activities were placed into an on-site oil-water separator. Reportedly, RID has the oil-water separator periodically pumped, cleaned, and the contents disposed of by a third-party disposal company.

Disposable sampling materials consisted of used personal protective equipment and used tubing. This investigation-derived waste was placed in doubled, heavy-duty plastic bags and disposed of in a dumpster at the Shannon & Wilson office.

APPENDIX B: LABORATORY REPORT

Appendix B

Laboratory Report

CONTENTS

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Shannon & Wilson
Ryan Peterson
400 N. 34th Street, Suite 100
Seattle, WA 98103

RE: Roza Irrigation Districts
Work Order Number: 2212014

December 12, 2022

Attention Ryan Peterson:

Fremont Analytical, Inc. received 6 sample(s) on 12/1/2022 for the analyses presented in the following report.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *12/12/2022*

CLIENT: Shannon & Wilson
Project: Roza Irrigation Districts
Work Order: 2212014

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2212014-001	MW-11-113022	11/30/2022 1:47 PM	12/01/2022 10:54 AM
2212014-002	MW-23-112922	11/29/2022 1:50 PM	12/01/2022 10:54 AM
2212014-003	MW-24-113022	11/30/2022 11:30 AM	12/01/2022 10:54 AM
2212014-004	MW-25-113022	11/30/2022 10:05 AM	12/01/2022 10:54 AM
2212014-005	MW-26-112922	11/29/2022 3:15 PM	12/01/2022 10:54 AM
2212014-006	MW-100-112922	11/29/2022 3:15 AM	12/01/2022 10:54 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2212014**
Date: **12/12/2022**

CLIENT: Shannon & Wilson
Project: Roza Irrigation Districts

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

CLIENT: Shannon & Wilson
Project: Roza Irrigation Districts

Lab ID: 2212014-001 **Collection Date:** 11/30/2022 1:47:00 PM
Client Sample ID: **MW-11-113022** **Matrix:** Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 38756		Analyst: KJ
Diesel Range Organics	ND	97.0		µg/L	1	12/9/2022 1:43:45 AM
Heavy Oil	179	97.0		µg/L	1	12/9/2022 1:43:45 AM
Total Petroleum Hydrocarbons	ND	194		µg/L	1	12/9/2022 1:43:45 AM
Surr: 2-Fluorobiphenyl	121	50 - 150		%Rec	1	12/9/2022 1:43:45 AM
Surr: o-Terphenyl	131	50 - 150		%Rec	1	12/9/2022 1:43:45 AM

NOTES:
Detection is due to a the presence of a single compound in the oil range

Lab ID: 2212014-002 **Collection Date:** 11/29/2022 1:50:00 PM
Client Sample ID: **MW-23-112922** **Matrix:** Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 38756		Analyst: KJ
Diesel Range Organics	ND	96.9		µg/L	1	12/9/2022 1:54:31 AM
Heavy Oil	259	96.9		µg/L	1	12/9/2022 1:54:31 AM
Total Petroleum Hydrocarbons	259	194		µg/L	1	12/9/2022 1:54:31 AM
Surr: 2-Fluorobiphenyl	99.6	50 - 150		%Rec	1	12/9/2022 1:54:31 AM
Surr: o-Terphenyl	127	50 - 150		%Rec	1	12/9/2022 1:54:31 AM

NOTES:
Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material

Lab ID: 2212014-003 **Collection Date:** 11/30/2022 11:30:00 AM
Client Sample ID: **MW-24-113022** **Matrix:** Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 38756		Analyst: KJ
Diesel Range Organics	ND	93.7		µg/L	1	12/9/2022 2:05:15 AM
Heavy Oil	555	93.7		µg/L	1	12/9/2022 2:05:15 AM
Total Petroleum Hydrocarbons	555	187		µg/L	1	12/9/2022 2:05:15 AM
Surr: 2-Fluorobiphenyl	114	50 - 150		%Rec	1	12/9/2022 2:05:15 AM
Surr: o-Terphenyl	132	50 - 150		%Rec	1	12/9/2022 2:05:15 AM

NOTES:
Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material

CLIENT: Shannon & Wilson
Project: Roza Irrigation Districts

Lab ID: 2212014-004 **Collection Date:** 11/30/2022 10:05:00 AM
Client Sample ID: **MW-25-113022** **Matrix:** Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 38756		Analyst: KJ
Diesel Range Organics	ND	94.2		µg/L	1	12/9/2022 2:16:00 AM
Heavy Oil	261	94.2		µg/L	1	12/9/2022 2:16:00 AM
Total Petroleum Hydrocarbons	261	188		µg/L	1	12/9/2022 2:16:00 AM
Surr: 2-Fluorobiphenyl	116	50 - 150		%Rec	1	12/9/2022 2:16:00 AM
Surr: o-Terphenyl	132	50 - 150		%Rec	1	12/9/2022 2:16:00 AM

NOTES:
Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material

Lab ID: 2212014-005 **Collection Date:** 11/29/2022 3:15:00 PM
Client Sample ID: **MW-26-112922** **Matrix:** Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 38756		Analyst: KJ
Diesel Range Organics	ND	96.1		µg/L	1	12/9/2022 8:41:26 AM
Heavy Oil	139	96.1		µg/L	1	12/9/2022 8:41:26 AM
Total Petroleum Hydrocarbons	ND	192		µg/L	1	12/9/2022 8:41:26 AM
Surr: 2-Fluorobiphenyl	121	50 - 150		%Rec	1	12/9/2022 8:41:26 AM
Surr: o-Terphenyl	132	50 - 150		%Rec	1	12/9/2022 8:41:26 AM

NOTES:
Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material

Analytical Report

Work Order: **2212014**
Date Reported: **12/12/2022**

CLIENT: Shannon & Wilson
Project: Roza Irrigation Districts

Lab ID: 2212014-006 **Collection Date:** 11/29/2022 3:15:20 AM
Client Sample ID: **MW-100-112922** **Matrix:** Groundwater

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.				Batch ID: 38756		Analyst: KJ
Diesel Range Organics	ND	95.6		µg/L	1	12/9/2022 8:52:25 AM
Heavy Oil	198	95.6		µg/L	1	12/9/2022 8:52:25 AM
Total Petroleum Hydrocarbons	198	191		µg/L	1	12/9/2022 8:52:25 AM
Surr: 2-Fluorobiphenyl	112	50 - 150		%Rec	1	12/9/2022 8:52:25 AM
Surr: o-Terphenyl	122	50 - 150		%Rec	1	12/9/2022 8:52:25 AM

NOTES:
Chromatographic pattern indicates an unresolved complex mixture, which may be weathered and/or organic material

Work Order: 2212014
CLIENT: Shannon & Wilson
Project: Roza Irrigation Districts

QC SUMMARY REPORT

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID: **MB-38756** SampType: **MBLK** Units: **µg/L** Prep Date: **12/7/2022** RunNo: **80361**
Client ID: **MBLKW** Batch ID: **38756** Analysis Date: **12/8/2022** SeqNo: **1660230**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics	ND	94.2									
Heavy Oil	ND	94.2									
Total Petroleum Hydrocarbons	ND	188									
Surr: 2-Fluorobiphenyl	22.3		23.54		94.7	50	150				
Surr: o-Terphenyl	25.3		23.54		108	50	150				

Sample ID: **LCS-38756** SampType: **LCS** Units: **µg/L** Prep Date: **12/7/2022** RunNo: **80361**
Client ID: **LCSW** Batch ID: **38756** Analysis Date: **12/8/2022** SeqNo: **1660231**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Petroleum Hydrocarbons	850	187	1,170	0	72.7	45.7	115				
Surr: 2-Fluorobiphenyl	19.6		23.40		83.9	50	150				
Surr: o-Terphenyl	27.2		23.40		116	50	150				

Sample ID: **LCSD-38756** SampType: **LCSD** Units: **µg/L** Prep Date: **12/7/2022** RunNo: **80361**
Client ID: **LCSW02** Batch ID: **38756** Analysis Date: **12/8/2022** SeqNo: **1660232**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Petroleum Hydrocarbons	1,160	190	1,187	0	97.7	45.7	115	850.3	30.8	30	R
Surr: 2-Fluorobiphenyl	21.9		23.75		92.1	50	150		0		
Surr: o-Terphenyl	34.1		23.75		143	50	150		0		

NOTES:
R - High RPD observed, spike recovery is within range.

Sample Log-In Check List

Client Name:	**SW**	Work Order Number:	**2212014**
Logged by:	**Elisabeth Samoray**	Date Received:	**12/1/2022 10:54:00 AM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☑	No ☐	Not Present ☐
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample 1	1.4

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Chain of Custody Record & Laboratory Services Agreement

Date: 11/30/22 Page: 1 of: 1

Laboratory Project No (internal): 2212014

Project Name: Roza Irrigation District

Special Remarks:

Client: Shannon & Wilson, Inc.

Project No: 100500-005

Address: 400 N. 34th St., Ste. 100

Collected by: MED

City, State, Zip: Seattle, WA 98103

Location: Sunnyside, WA

Telephone: 206-632-8020

Report To (PM): Ryan Peterson

Sample Disposal: ☐ Return to client ☐ Disposal by lab (after 30 days)

Fax: 206-695-6777

PM Email: ryan.peterson@shanwil.com

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOCs (EPA 8260 / 624)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SVOCs (EPA 8270 / 625)	PAHs (EPA 8270 - SIM)	PCBs (EPA 8082 / 608)	Metals** (EPA 6020 / 200.8)	Total (T) | Dissolved (D)	Anions (IC)***	EDB (8011)	Comments
1			MED, 11/30	GW					X									
2	MW-11-113022	11/30	13:47	GW					X									
3	MW-23-112922	11/29	13:50															
4	MW-24-113022	11/30	11:30															
5	MW-25-113022	11/30	10:05															
6	MW-26-112922	11/29	15:15															
7	MW-100-112922	11/29	15:20															
8																		
9																		
10																		

MED, 11/30

*Matrix: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm Water, WW = Waste Water

**Metals (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL *Individual:* Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above and that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x Morgen Donohue	11/30 16:00	x [illegible]	12/01 10:54
Relinquished	Date/Time	Received	Date/Time
x		x	

Turn-around Time:

- ☒ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day ____ (specify)

IMPORTANT INFORMATION

Important Information

About Your Environmental Site Assessment/Evaluation Report

IMPORTANT INFORMATION

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.

IMPORTANT INFORMATION

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 is 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