FLOYD | SNIDER
strategy ▪ science ▪ engineering

Two Union Square
601 Union Street, Suite 600
Seattle, WA 98101
tel: 206.292.2078 fax: 206.682.7867

Memorandum

To: John Mefford, Washington State Department of Ecology

Copies: Surjit Singh, Big B LLC
Louis Russell, Cascadia Law Group PLLC
Scott MacDonald, BNSF Railway Company

From: Gabe Cisneros and Manique Talaia-Murray, Floyd|Snider

Date: January 15, 2025

Project No: CL-Ellensburg, Big B (Cleanup Site ID: 4901)

Re: **2024 Data Summary Memorandum**

PURPOSE

Floyd|Snider has prepared this technical memorandum to summarize semiannual groundwater compliance monitoring performed in 2024 at the Big B Mini Mart Site (Site; Facility Site ID [FSID] #386, Cleanup Site ID [CSID] #4901) located at 1611 Canyon Road in Ellensburg, Washington (referred to as the Big B property; Figure 1). All work was completed in accordance with the Cleanup Action Plan (CAP) approved by the Washington State Department of Ecology (Ecology) in November 2020 (Ecology 2020).

In accordance with the CAP and Engineering Design Report (EDR; Appendix B of Ecology 2020), Phase I remedial excavation activities were conducted between May and October 2021, and Phase II remedial excavation activities were conducted in June 2022. During excavation, a total of 625.55 tons of petroleum-impacted soil were removed from the Site, including from areas on the south-adjacent Toad's (Astro) Station (herein referred to as Toad's) property and the west-adjacent BNSF Railway Company property. Impacted soil was excavated to Site-specific remediation levels (RELs) based on residual saturation levels for diesel-range organics (DRO) and gasoline-range organics (GRO) defined in the CAP, which are greater than the Site cleanup levels (CULs). Therefore, soil impacted with contaminants of concern (COCs) at concentrations greater than the CULs and less than the RELs was left in place. The remaining petroleum-impacted soil in the vadose zone is being treated using a bioventing system beneath the properties to prevent leaching of contamination to groundwater. A temporary subslab soil vapor monitoring point was installed on July 6, 2022, within the former station building, and three monitoring wells were replaced in areas that had been excavated in 2021 and 2022 (MW-2A, MW-4B, and MW-9A). Excavation activities are summarized in the Remedial Action Completion Report (RACR; Floyd|Snider 2022). The extent of excavation activities, key Site features, and monitoring locations are displayed on Figure 2.

Bioventing was selected as part of the remedy to remediate impacted soil remaining in the vadose/capillary fringe after excavation activities are complete to ensure protection of groundwater. The bioventing system was installed on May 16, 2023, and has been operational continuously since that date, except between August 27 and September 6, 2023, during which the power to the Site was turned off.

This memorandum summarizes the results for the second round of semiannual groundwater sampling event that were conducted in accordance with the CAP and EDR. Environmental data associated with the 2024 monitoring events were submitted to Ecology's Environmental Information Management (EIM) database on December 16, 2024.

GROUNDWATER MONITORING AND SAMPLING EVENTS

The first monitoring event of 2024 occurred on May 7, 2024, and the second event occurred on September 10, 2024. Light non-aqueous phase liquid (LNAPL) and static water levels were collected from Site wells prior to groundwater sample collection. LNAPL was not detected on any monitoring well. Potentiometric surface maps and approximate groundwater flow directions for each event are shown on Figures 3 and 4, and groundwater elevations are summarized in Table 1. Groundwater flow direction was generally toward the southwest in the spring; and in the fall, flow direction was toward the southwest on the Big B property and shifted to the southeast on the Toad's property. The hydraulic gradient for both field events was approximately 0.001 feet per foot (ft/ft).

Groundwater sampling was performed on the Big B property upgradient wells MW-1A and MW-3; Big B property performance wells MW-2A, MW-4B, and MW-9A; and Toad's property wells MW-1 and MW-2 (shown as T-MW-1 and T-MW-2 on Figures 3 and 4). The upgradient wells were added to the sampling network to comply with the recommendations in Ecology's *Guidance for Silica Gel Cleanup in Washington State* (2023) for quantifying naturally occurring organics in pre- and post-silica gel cleanup (SGC) DRO samples.

At each monitoring well, disposable polyethylene tubing was inserted so that the intake was at the approximate midpoint of the well screened interval. The tubing was attached to a peristaltic pump, and groundwater was purged at a low-flow rate of less than 0.5 liters per minute. During purging, water quality parameters (i.e., temperature, pH, specific conductivity, and turbidity) were recorded at approximately 3- to 5-minute intervals using a YSI Pro DDS multiparameter water quality meter (YSI) until parameters were approximately stable (within 10%), or until a maximum of 30 minutes of purging had elapsed.

After the well had been purged, the groundwater samples were collected by directly filling the laboratory-provided bottles from the pump discharge at the same flow rate that was used for purging.

All performance groundwater samples were stored on ice for transport and submitted to Friedman & Bruya, Inc. for analysis of the following constituents:

- GRO by NWTPH-Gx
- DRO and oil-range organics (ORO) by NWTPH-Dx, with and without SGC
- Benzene, toluene, ethylbenzene, total xylenes, and naphthalene (BTEXN) by USEPA Method 8260

A subset of performance wells, MW-2A (Big B), MW-4B (Big B), and MW-1 (Toad's), were analyzed for total organic carbon (TOC) by USEPA Method 9060A and monitored natural attenuation (MNA) parameters. The following geochemical parameters were recorded in the field for MNA monitoring:

- Dissolved oxygen (DO; YSI)
- Oxidation–reduction potential (ORP; YSI)
- pH (YSI)
- Conductivity (YSI)
- Temperature (YSI)
- Ferrous iron (Hach field kits)

Samples from these wells were also analyzed for additional geochemical MNA indicators:

- Nitrate by USEPA Method 300.0
- Manganese (soluble) by USEPA Method 200.8 (field filtered)
- Sulfate by USEPA Method 300.0
- Methane by RSK-175

To account for naturally occurring organics, upgradient wells MW-1A and MW-3 were analyzed for DRO and ORO with and without SGC and for MNA parameters. MW-1A and MW-3 are hydraulically upgradient and cross-gradient, respectively, of contaminant sources and releases to the Site.

GROUNDWATER SAMPLING RESULTS

Groundwater analytical results are provided in Table 2. The laboratory analytical reports and groundwater sampling forms are included as Attachment 1. Concentrations of GRO from all samples were either not detected or were detected at concentrations less than the Site CUL of 800 micrograms per liter (µg/L). Additionally, BTEXN has not been detected in any well at concentrations exceeding their respective laboratory reporting limits since cleanup actions were completed.

TOC concentrations from upgradient/background monitoring wells MW-1A and MW-3 were used to quantify the amount of naturally occurring organics present in Site groundwater. The concentration of polar metabolic by-products was calculated using the following formula:

NWTPH-Dx (no SGC) – NWTPH-Dx (with SGC) – Background NWTPH-Dx (no SGC) = polar metabolic by-product concentration; where, NWTPH-Dx (no SGC) is the total concentration of DRO, ORO, and polar metabolic by-products, NWTPH-Dx (with SGC) is the concentration of non-polar hydrocarbons, and background NWTPH-Dx (no SGC) is the seasonal concentration of total DRO+ORO at unimpacted upgradient wells.

The results of these calculations are presented in Table 2. The concentration of polar metabolic by-products was compared to a CUL of 500 µg/L because DRO is detected in Site groundwater in pre-SGC analyses.

DRO Results without SGC: During the 2024 spring event, concentrations of DRO without SGC exceeded the Site CUL of 500 µg/L in the following wells:

- MW-2A
- MW-4B
- MW-1 (Toad's)
- MW-2 (Toad's)

During the 2024 fall event, concentrations of DRO without SGC exceeded the Site CUL of 500 µg/L in the following wells:

- MW-4B
- MW-1 (Toad's)
- MW-2 (Toad's)

MW-9A, located in the southeast corner of the Big B property, and MW-2A, located in the center of the Big B property, both contained measurable LNAPL thicknesses prior to cleanup activities and were less the CUL during the 2024 fall event. During the 2024 spring event, the concentration of DRO of the sampled wells was greatest at MW-2 (6,400 µg/L) on Toad's. During the 2024 fall event, the concentration of DRO was greatest at MW-4B (3,300 µg/L), located in the southwestern corner of the Site. These findings are identical to those observed in the 2023 events. Concentrations of DRO generally decreased between the spring and fall monitoring events, a trend that was also observed in 2023, indicating there are seasonal trends to DRO concentrations coinciding with lower fall water levels.

DRO Results with SGC: Silica gel absorbs polar compounds such as acids (and esters), alcohols, ketones, phenols, aldehydes, and naturally occurring organic matter in the groundwater sample, leaving the nonpolar DRO to be quantified more accurately in the analytical sample.

During the 2024 spring event, DRO concentrations analyzed with SGC in groundwater exceeded the CUL in the following wells:

- MW-4B
- MW-2 (Toad's)

During the 2024 fall event, DRO concentrations using SGC exceeded the CUL in the following wells:

- MW-1 (Toad's)
- MW-2 (Toad's)

The 2024 fall results at MW-1 (Toad's) and MW-2 (Toad's) were elevated compared to 2023 fall results.

Polar Metabolic By-Products: Polar metabolic by-products exceeded the CUL of 500 µg/L in the following wells:

- MW-4B
- MW-2A
- MW-1 (Toad's)
- MW-2 (Toad's)

Concentrations of total metabolic by-products were greatest at MW-4B and MW-2 (Toad's), which is understandable given the linear relationship between elevated DRO and the concentration of total metabolic by-products. The results of these calculations show that a substantial portion of the DRO results (without SGC) at monitoring locations within the dissolved phase plume can be accounted for by polar metabolites, which account for between 60% to 90% of the NWTPH-Dx result in all samples except for the fall sample collected from MW-1 (Toad's), which had an elevated post-SGC NWTPH-Dx concentration.

Chromatogram patterns indicate weathered diesel and biodegradation metabolites, which are present in the chromatograms for samples analyzed without SGC but are absent in chromatograms for samples analyzed with SGC (Attachment 1). The chromatograms are one line of evidence that biodegradation is occurring at the Site.

Attachment 2 contains a detailed analysis of the MNA analytical results and trends analysis. The trend analysis concludes that there is strong evidence that natural attenuation of groundwater contaminants by aerobic and anaerobic biodegradation is occurring in Site groundwater, particularly at the monitoring locations with the greatest mass of dissolved-phase total petroleum hydrocarbons (TPH) in groundwater.

BIOVENTING SYSTEM STATUS

As specified in the bioventing system operations and maintenance (O&M) manual (Attachment 3 of Appendix D, Floyd|Snider 2022), blower operation, injection pressure, and temperature were monitored for 24 hours following system installation and have been regularly monitored monthly. Except for the time frame between August 7 and September 6, 2023, the blower has been running continuously, and these parameters are within expected limits.

The O&M manual also specifies that readings of the bioventing lines flow rate will also be periodically collected using a handheld anemometer. Readings were collected at each semiannual monitoring event using a TSI Model 9565 VelociCalc® multi-function ventilation meter. Readings to each line have varied slightly but are within acceptable ranges.

The bioventing system layout is presented on Figure 2.

CONCLUSIONS AND NEXT STEPS

Semiannual monitoring of groundwater was completed at the Big B Site in May and September 2024.

DRO concentrations analyzed without SGC show exceedances in all groundwater samples, except for samples from MW-1A, MW-3, and MW-9A, as observed in 2023. DRO results analyzed with SGC indicate that dissolved DRO in a subset of wells (MW-4B, MW-1 [Toad's], and MW-2 [Toad's]) were elevated compared to the 2023 results. The calculated concentrations of total metabolic by-products mirror the elevated concentrations of DRO in groundwater in the monitoring network.

Analytical groundwater results collected between 2023 and 2024 at the Site provide strong evidence that natural attenuation of groundwater contaminants by aerobic and anaerobic biodegradation is occurring in Site groundwater, particularly at the monitoring locations with the greatest mass of dissolved-phase TPH in groundwater. Because these monitoring results were successful in establishing MNA as an ongoing process at the Site, we propose that future groundwater sampling does not include the full suite of MNA parameters. However, field parameters, such as conductivity, temperature, pH, turbidity, DO, and ORP, will continue to be collected and recorded as part of the low-flow sampling procedure.

In addition, we also propose that NWTPH-Gx and BTEXN be eliminated from future analytical reporting because there have been no CUL exceedances in GRO, and all BTEXN results have been less than their respective reporting limits to date in all performance samples. However, GRO and BTEXN will be analyzed in these wells when collecting four consecutive quarters of confirmation samples.

To comply with Ecology's *Guidance for Silica Gel Cleanup in Washington State* for quantifying naturally occurring organics in pre- and post-SGC DRO samples, the monitoring network will continue to consist of the following monitoring wells: MW-1A, MW-2, MW-3, MW-4B, and MW-9A on the Big B property and MW-1 and MW-2 on the Toad's property.

The bioventing system is operating normally but will be monitored monthly for general operations, outflow temperature, and outflow pressure. Flow rates from individual bioventing lines will be analyzed semiannually, coincident with future monitoring events. Future groundwater monitoring results will be used to determine whether the system is assisting with natural attenuation processes.

REFERENCES

Floyd|Snider. 2022. *Remedial Action Completion Report: Big B Mini Mart Site*. Prepared for Big B LLC. November.

Washington State Department of Ecology (Ecology). 2020. *Cleanup Action Plan: Big B Mini Mart Site, Ellensburg, WA*. Prepared by Floyd|Snider. November.

_____. 2022. *Guidance for Evaluating Vapor Intrusion in Washington State: Investigation and Remedial Action*. Originally published January 2009. Revised March 2022.

_____. 2023. *Guidance for Silica Gel Cleanup in Washington State*. Publication No. 22-09-059. November.

_____. 2024. "CLARC Data Tables and Other Technical Information." Last accessed November 1, 2024. https://ecology.wa.gov/regulations-permits/guidance-technical-assistance/contamination-clean-up-tools/clarc/data-tables

LIST OF ATTACHMENTS

Table 1 Groundwater Elevation Summary

Table 2 Groundwater Analytical Results

Figure 1 Vicinity Map

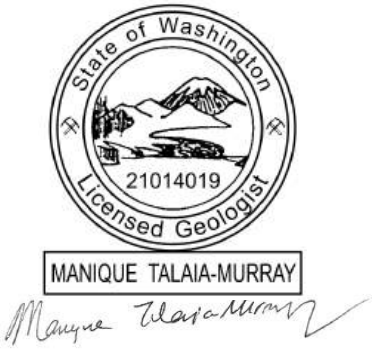
Figure 2 Site Map

Figure 3 Groundwater Elevation and Contour Map, May 7, 2024

Figure 4 Groundwater Elevation and Contour Map, September 10, 2024

Attachment 1 Spring and Fall 2024 Laboratory Reports and Groundwater Sampling Forms

Attachment 2 Monitored Natural Attenuation at Big B Mini Mart Site



Tables

Table 1
Groundwater Elevation Summary

Well ID	Screened Interval (feet bgs)	TOC Elevation (feet NAVD 88)	Date	Depth to Water (feet bTOC)	Groundwater Elevation (feet NAVD 88)
Big B Property					
MW-1A	4–14	1,490.76	5/1/2023	4.64	1,486.12
			9/7/2023	5.61	1,485.15
			5/7/2024	4.88	1,485.88
			9/10/2024	5.57	1,485.19
MW-2A	3–13	1,490.91	5/1/2023	4.85	1,486.06
			9/7/2023	5.89	1,485.02
			5/7/2024	5.11	1,485.80
			9/10/2024	5.75	1,485.16
MW-3	1–11	1,490.88	5/1/2023	4.82	1,486.06
			9/7/2023	5.78	1,485.10
			5/7/2024	5.07	1,485.81
			9/10/2024	5.70	1,485.18
MW-4B	3–13	1,489.79	5/1/2023	3.85	1,485.94
			9/7/2023	4.82	1,484.97
			5/7/2024	4.19	1,485.60
			9/10/2024	4.79	1,485.00
MW-8	3–13	1,490.85	5/1/2023	4.72	1,486.13
			9/7/2023	5.76	1,485.09
			5/7/2024	5.04	1,485.81
			9/10/2024	5.66	1,485.19
MW-9A	3–13	1,489.97	5/1/2023	3.96	1,486.01
			9/7/2023	4.95	1,485.02
			5/7/2024	4.89	NM
			9/10/2024	4.90	1,485.07
MW-10	4–14	1,490.83	5/1/2023	4.78	1,486.05
			9/7/2023	5.81	1,485.02
			5/7/2024	5.04	1,485.79
			9/10/2024	5.66	1,485.17
Toad's Property					
T-MW-1	4–14	1,490.31	5/1/2023	4.36	1,485.95
			9/7/2023	5.39	1,484.92
			5/7/2024	4.69	1,485.62
			9/10/2024	5.37	1,484.94
T-MW-2	4–14	1,490.24	5/1/2023	4.35	1,485.89
			9/7/2023	5.22	1,485.02
			5/7/2024	4.53	NM
			9/10/2024	5.19	1,485.05

Abbreviations:

bgs Below ground surface
bTOC Below top of casing
NM Not measured
NAVD 88 North American Vertical Datum of 1988
TOC Top of casing

Table 2
Groundwater Analytical Results

				Area	Upgradient/Background				Within Dissolved-Phase Plume			
				Location Name	MW-1A		MW-3		MW-2A			
				Sample Name	MW-1A-050724	MW-1A-091024	MW-3-050724	MW-3-091024	MW-2A-050123	MW-2A-090723	MW-2A-050724	MW-2A-091024
				Sample Date	5/7/2024	9/10/2024	5/7/2024	9/10/2024	5/1/2023	9/7/2023	5/7/2024	9/10/2024
Analyte	**CAS No.**	**CUL [1]**	**Unit**									
Total Petroleum Hydrocarbons by NWTPH-Gx, -Dx												
Gasoline-range organics	GRO	800	µg/L					390	330	410	440
Diesel-range organics	DRO	500	µg/L	110 [2]	50 U	430 [2]	64 [2]	**2,700** [2]	**540** [2]	**1,200** [2]	490 [2]
Oil-range organics	ORO	--	µg/L	250 U	250 U	250 U	250 U	340 [2]	250 U	250 U	250 U
Total DRO & ORO	T_DRO&ORO (U=0)	500	µg/L	110	250 U	430	64	**3,000**	**540**	**1,200**	490
Total Petroleum Hydrocarbons by NWTPH-Dx w/ Silica Gel Cleanup												
Diesel-range organics	DRO	500	µg/L	50 U	50 U	60 U	50 U	110	50 U	50 U	79 [2]
Oil-range organics	ORO	--	µg/L	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
Total DRO & ORO	T_DRO&ORO (U=0)	500	µg/L	250 U	250 U	250 U	250 U	110	250 U	250 U	79
Adjusted for Silica Gel Cleanup												
Non-Polar Hydrocarbons	T_DRO&ORO (U=0)	--	µg/L	250 U	250 U	250 U	250 U	110	50 U	50 U	79
Total Polar Metabolites and NOC Quantified within the DRO and ORO [3]		--	µg/L	110	250 U	430	64	2,900	540	1,200	410
Naturally Occurring Organics [3,4]		--	µg/L	110	--	430	64	--	--	270	64
Polar Metabolic By-Products [5]		500/700 [6]	µg/L	--	--	--	--	--	--	**930**	350
BTEX-N by EPA 8260D												
Benzene	71-43-2	5	µg/L					0.35 U	0.35 U	0.35 U	0.35 U
Toluene	108-88-3	1,000	µg/L					1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	100-41-4	700	µg/L					1.0 U	1.0 U	1.0 U	1.0 U
Xylene (meta & para)	108-38-3/106-42-3	--	µg/L					2.0 U	2.0 U	2.0 U	2.0 U
Xylene (ortho)	95-47-6	--	µg/L					1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	1330-20-7	1,000	µg/L					2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	91-20-3	160	µg/L					1.0 U	1.0 U	1.0 U	1.0 U
Dissolved Gases by RSK 175												
Methane	74-82-8	--	mg/L	0.0061	0.0050 U	0.0053	0.0089	0.27	0.22	0.49	0.61
Dissolved Metals by EPA 6020B												
Manganese	7439-96-5	--	µg/L	41	2	290	190	760	760	710	750
Conventionals												
Ferrous iron	15438-31-0	--	mg/L	0 J	0 J	0 J	0 J	1.5 J	3.0 J	2.5 J	3.5 J
Nitrate (as Nitrogen)	--	--	mg/L	6.5 J	3.8	2.7 J	1.4	0.20 UJ	0.20 UJ	0.20 UJ	0.40 U
Sulfate	14808-79-8	--	mg/L	20	16	23	13	13	16	24	17
Total Organic Carbon [7]	TOC	--	µg/L	3,300	2,000	2,600	1,900	7,800	4,200	4,900	3,900

Table 2
Groundwater Analytical Results

			Area	Upgradient/Background				Within Dissolved-Phase Plume			
			Location Name	MW-1A		MW-3		MW-2A			
			Sample Name	MW-1A-050724	MW-1A-091024	MW-3-050724	MW-3-091024	MW-2A-050123	MW-2A-090723	MW-2A-050724	MW-2A-091024
			Sample Date	5/7/2024	9/10/2024	5/7/2024	9/10/2024	5/1/2023	9/7/2023	5/7/2024	9/10/2024
Analyte	**CAS No.**	**CUL [(1)]**	**Unit**								
Field Parameters											
Depth to Water	WDepth	--	ft	4.9	4.88	5.08	5.07	4.85	5.87	5.12	5.11
Dissolved Oxygen	--	--	mg/L	0.45	1.21	0.45	0.37	0.21	0.29	0.4	0.35
ORP	--	--	mV	107.6	114.4	46.1	124	23.5	-91	-50.5	-86.5
pH	pH	--	pH	6.59	6.42	6.64	6.5	6.96	6.72	6.68	6.57
Specific Conductance	--	--	µS/cm	269.6	625	325.1	670	521	770	389.4	745
Temperature	--	--	°C	13.5	21.5	12.1	18.8	10.7	20	12.3	21
Turbidity	--	--	ntu	1.9	1.52	0.66	1.57	3.98	0.67	2.3	2.68

Notes:

All blank cells are intentional.

All chemistry results are rounded to two significant figures.

Field parameters are reported as displayed by the sampling equipment.

-- Not available.

RED/BOLD Analyte was detected at a concentration greater than the CUL.

1 CULs are based on MTCA Method A values (Ecology 2024).

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

3 Characterizing the contribution from naturally occurring organics in groundwater to the TPH totals may be done by analyzing clean representative background samples (located hydraulically upgradient of contaminant sources and releases to the site) from permanent monitoring wells.

4 The average concentration of naturally occurring organics is obtained by using the total organic carbon concentrations from the two upgradient wells MW-1A and MW-3 during each monitoring event.

5 The polar metabolic byproduct concentration is derived by [NWTPH-Dx (no SGC)] – [NWTPH-Dx (with SGC)] – [Background NWTPH-Dx (no SGC)] = polar metabolic byproduct concentration.

6 A Site-wide CUL of 700 µg/L may be applied for sites that have no detectable concentrations of petroleum hydrocarbons (i.e., no detects using NWTPH-Gx or -Dx with silica gel cleanup).

7 Total organic carbon by SM 5310C.

Abbreviations:

BTEX-N Benzene, toluene, ethylene, xylene, and naphthalene
°C Degrees Celsius
CAS Chemical Abstracts Service
CUL Cleanup level
ft Feet
µg/L Micrograms per liter
µS/cm Microsiemens per centimeter
mg/L Milligrams per liter
mV Millivolts
MTCA Model Toxics Control Act
ntu Nephelometric turbidity unit
ORP Oxidation–reduction potential
TPH Total petroleum hydrocarbons
VOC Volatile organic compound

Qualifiers:

J Analyte was detected; concentration is an estimate.
U Analyte was not detected at the associated reporting limit.
UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 2
Groundwater Analytical Results

				Area	Within Dissolved-Phase Plume (cont.)								
				Location Name	MW-4B					MW-9A			
				Sample Name	MW-4B-050123	MW-4B-090723	MW-104B-090723	MW-4B-050724	MW-4B-091024	MW-9A-050123	MW-9A-090723	MW-9A-050724	MW-9A-091024
				Sample Date	5/1/2023	9/7/2023	9/7/2023	5/7/2024	9/10/2024	5/1/2023	9/7/2023	5/7/2024	9/10/2024
Analyte	**CAS No.**	**CUL [1]**	**Unit**										
Total Petroleum Hydrocarbons by NWTPH-Gx, -Dx													
Gasoline-range organics	GRO	800	µg/L	440	490	490	360	550	100 U	100 U	100 U	100 U
Diesel-range organics	DRO	500	µg/L	**5,000 [2]**	**2,200 [2]**	**2,200 [2]**	**5,300 [2]**	**3,300 [2]**	120 [2]	50 U	160 [2]	160 [2]
Oil-range organics	ORO	--	µg/L	470 [2]	370 [2]	350 [2]	530 [2]	300 [2]	250 U	250 U	250 U	250 U
Total DRO & ORO	T_DRO&ORO (U=0)	500	µg/L	**5,500**	**2,600**	**2,600**	**5,800**	**3,600**	120	250 U	160	160
Total Petroleum Hydrocarbons by NWTPH-Dx w/ Silica Gel Cleanup													
Diesel-range organics	DRO	500	µg/L	360	390	430	**510 [2]**	390 [2]	50 U	50 U	50 U	50 U
Oil-range organics	ORO	--	µg/L	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
Total DRO & ORO	T_DRO&ORO (U=0)	500	µg/L	360	390	430	**510**	390	250 U	250 U	250 U	250 U
Adjusted for Silica Gel Cleanup													
Non-Polar Hydrocarbons	T_DRO&ORO (U=0)	500	µg/L	360	390	430	510	390	250 U	250 U	250 U	250 U
Total Polar Metabolites and NOC Quantified within the DRO and ORO [3]		--	µg/L	5,100	2,200	2,200	5,300	3,200	120	250 U	160	160
Naturally Occurring Organics [3,4]		--	µg/L	--	--	--	270	64	--	--	270	64
Polar Metabolic By-Products [5]		500/700 [6]	µg/L	--	--	--	**5,000**	**3,100**	--	--	250 U	250 U
BTEX-N by EPA 8260D													
Benzene	71-43-2	5	µg/L	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Toluene	108-88-3	1,000	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	100-41-4	700	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (meta & para)	108-38-3/106-42-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Xylene (ortho)	95-47-6	--	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	1330-20-7	1,000	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	91-20-3	160	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dissolved Gases by RSK 175													
Methane	74-82-8	--	mg/L	0.65	0.62	0.62	1.5	1.3				
Dissolved Metals by EPA 6020B													
Manganese	7439-96-5	--	µg/L	1,400	960	910	1,100	1,000				
Conventionals													
Ferrous iron	15438-31-0	--	mg/L	2.0 J	3.0 J		2.0 J	5.0 J			3.0 J	0.5 J
Nitrate (as Nitrogen)	--	--	mg/L	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ	0.40 U				
Sulfate	14808-79-8	--	mg/L	7.9	2.7	2.6	2.2	2.0				
Total Organic Carbon [7]	TOC	--	µg/L	12,000	6,300	6,600	8,900	11,000				

Table 2
Groundwater Analytical Results

			Area	Within Dissolved-Phase Plume (cont.)								
			Location Name	MW-4B					MW-9A			
			Sample Name	MW-4B-050123	MW-4B-090723	MW-104B-090723	MW-4B-050724	MW-4B-091024	MW-9A-050123	MW-9A-090723	MW-9A-050724	MW-9A-091024
			Sample Date	5/1/2023	9/7/2023	9/7/2023	5/7/2024	9/10/2024	5/1/2023	9/7/2023	5/7/2024	9/10/2024
Analyte	**CAS No.**	**CUL [1]**	**Unit**									
Field Parameters												
Depth to Water	WDepth	--	ft	3.85	4.84		4.25	4.19	3.96	5	4.95	4.89
Dissolved Oxygen	--	--	mg/L	0.2	0.13		0.29	0.21	0.3	0.17	0.34	0.34
ORP	--	--	mV	6	-86.2		-21.3	-94.6	60.8	60.5	89.2	30
pH	pH	--	pH	7	6.7		6.79	6.69	7.04	6.67	6.61	6.6
Specific Conductance	--	--	µS/cm	491.6	716		261.1	682	344	716	264.2	626
Temperature	--	--	°C	10.4	20.8		12.4	21.1	11.1	19.5	13.2	19.8
Turbidity	--	--	ntu	1.61	0.57		1.45	0.98	1.42	0.65	2.58	5.61

Notes:

All blank cells are intentional.

All chemistry results are rounded to two significant figures.

Field parameters are reported as displayed by the sampling equipment.

-- Not available.

RED/BOLD Analyte was detected at a concentration greater than the CUL.

1 CULs are based on MTCA Method A values (Ecology 2024).

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

3 Characterizing the contribution from naturally occurring organics in groundwater to the TPH totals may be done by analyzing clean representative background samples (located hydraulically upgradient of contaminant sources and releases to the site) from permanent monitoring wells.

4 The average concentration of naturally occurring organics is obtained by using the total organic carbon concentrations from the two upgradient wells MW-1A and MW-3 during each monitoring event.

5 The polar metabolic byproduct concentration is derived by [NWTPH-Dx (no SGC)] – [NWTPH-Dx (with SGC)] – [Background NWTPH-Dx (no SGC)] = polar metabolic byproduct concentration.

6 A Site-wide CUL of 700 µg/L may be applied for sites that have no detectable concentrations of petroleum hydrocarbons (i.e., no detects using NWTPH-Gx or -Dx with silica gel cleanup).

7 Total organic carbon by SM 5310C.

Abbreviations:

BTEX-N Benzene, toluene, ethylene, xylene, and naphthalene
°C Degrees Celsius
CAS Chemical Abstracts Service
CUL Cleanup level
ft Feet
µg/L Micrograms per liter
µS/cm Microsiemens per centimeter
mg/L Milligrams per liter
mV Millivolts
MTCA Model Toxics Control Act
ntu Nephelometric turbidity unit
ORP Oxidation–reduction potential
TPH Total petroleum hydrocarbons
VOC Volatile organic compound

Qualifiers:

J Analyte was detected; concentration is an estimate.
U Analyte was not detected at the associated reporting limit.
UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Table 2
Groundwater Analytical Results

Area				Within Dissolved-Phase Plume (cont.)										
Location Name				MW-1 (Toad's)							MW-2 (Toad's)			
Sample Name				MW-1-050123	MW-101-050123	MW-1-090723	MW-1-050724	MW-101-050724	MW-1-091024	MW-101-091024	MW-2-050123	MW-2-090723	MW-2-050724	MW-2-091024
Sample Date				5/1/2023	5/1/2023	9/7/2023	5/7/2024	5/7/2024	9/10/2024	9/10/2024	5/1/2023	9/7/2023	5/7/2024	9/10/2024
Analyte	**CAS No.**	**CUL [1]**	**Unit**											
Total Petroleum Hydrocarbons by NWTPH-Gx, -Dx														
Gasoline-range organics	GRO	800	µg/L	100 U	100 U	100 U	100 U	100 U	210	280	160	100 U	100 U	100 U
Diesel-range organics	DRO	500	µg/L	**640** [2]	**680** [2]	**1,700** [2]	**1,000** [2]	**1,100** [2]	**1,200** [2]	**2,200** [2]	**5,400** [2]	**1,300** [2]	**6,400** [2]	**3,600** [2]
Oil-range organics	ORO	--	µg/L	250 U	250 U	250 U	250 U	250 U	700	1,500	780 [2]	370 [2]	700 [2]	450 [2]
Total DRO & ORO	T_DRO&ORO (U=0)	500	µg/L	**640**	**680**	**1,700**	**1,000**	**1,100**	**1,900**	**3,700**	**6,200**	**1,700**	**7,100**	**4,100**
Total Petroleum Hydrocarbons by NWTPH-Dx w/ Silica Gel Cleanup														
Diesel-range organics	DRO	500	µg/L	99	82	210	130	120	**540**	**1,400**	300	150	**640**	**780**
Oil-range organics	ORO	--	µg/L	250 U	250 U	250 U	250 U	250 U	530	1,200	250 U	250 U	250 U	280 U
Total DRO & ORO	T_DRO&ORO (U=0)	500	µg/L	99	82	210	130	120	**1,100**	**2,600**	300	150	**640**	**780**
Adjusted for Silica Gel Cleanup														
Non-Polar Hydrocarbons	T_DRO&ORO (U=0)	--	µg/L	99	82	210	130	120	1,100	2,600	300	150	640	780
Total Polar Metabolites and NOC Quantified within the DRO and ORO [3]		--	µg/L	540	600	1,500	870	980	800	1,100	5,900	1,600	6,500	3,300
Naturally Occurring Organics [3,4]		--	µg/L	--	--	--	270	270	64	64	--	--	270	64
Polar Metabolic By-Products [5]		500/700 [6]	µg/L	--	--	--	**600**	**710**	**740**	**1,000**	--	--	**6,200**	**3,200**
BTEX-N by EPA 8260D														
Benzene	71-43-2	5	µg/L	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
Toluene	108-88-3	1,000	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	100-41-4	700	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (meta & para)	108-38-3/106-42-3	--	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Xylene (ortho)	95-47-6	--	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	1330-20-7	1,000	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Naphthalene	91-20-3	160	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dissolved Gases by RSK 175														
Methane	74-82-8	--	mg/L	0.11	0.10	0.20	0.11	0.11	0.21	0.15				
Dissolved Metals by EPA 6020B														
Manganese	7439-96-5	--	µg/L	780	770	860	730	730	750	730				
Conventionals														
Ferrous iron	15438-31-0	--	mg/L	3.5 J		3.5 J	4.5 J		2.5 J				2.5 J	4.0 J
Nitrate (as Nitrogen)	--	--	mg/L	0.20 UJ	0.20 UJ	0.20 UJ	0.20 U	0.20 U	0.40 U	0.40 U				
Sulfate	14808-79-8	--	mg/L	14	14	2.9	20	20	12	12				
Total Organic Carbon [7]	TOC	--	µg/L	4,500	4,500	7,200	4,600	4,600	4,600	4,500				

Table 2
Groundwater Analytical Results

Area				Within Dissolved-Phase Plume (cont.)										
Location Name				MW-1 (Toad's)							MW-2 (Toad's)			
Sample Name				MW-1-050123	MW-101-050123	MW-1-090723	MW-1-050724	MW-101-050724	MW-1-091024	MW-101-091024	MW-2-050123	MW-2-090723	MW-2-050724	MW-2-091024
Sample Date				5/1/2023	5/1/2023	9/7/2023	5/7/2024	5/7/2024	9/10/2024	9/10/2024	5/1/2023	9/7/2023	5/7/2024	9/10/2024
Analyte	**CAS No.**	**CUL [(1)]**	**Unit**											
Field Parameters														
Depth to Water	WDepth	--	ft	4.36		5.39	4.64		4.69		4.35	5.22	4.56	4.53
Dissolved Oxygen	--	--	mg/L	0.05		0.23	0.3		0.19		0.08	0.28	0.45	0.26
ORP	--	--	mV	-50.2		-106.2	26.7		-82.6		-68.9	-122.5	-67.8	-114.2
pH	pH	--	pH	6.86		6.74	6.77		6.78		6.81	6.71	6.61	6.65
Specific Conductance	--	--	µS/cm	470.1		828	266.5		653		551	764	369.5	759
Temperature	--	--	°C	10.8		20.3	12.2		20.5		11	21.7	12.2	21.8
Turbidity	--	--	ntu	3.67		0.41	3.16		0.97		2.2	0.82	1.73	2.25

Notes:

All blank cells are intentional.

All chemistry results are rounded to two significant figures.

Field parameters are reported as displayed by the sampling equipment.

-- Not available.

RED/BOLD Analyte was detected at a concentration greater than the CUL.

1 CULs are based on MTCA Method A values (Ecology 2024).

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

3 Characterizing the contribution from naturally occurring organics in groundwater to the TPH totals may be done by analyzing clean representative background samples (located hydraulically upgradient of contaminant sources and releases to the site) from permanent monitoring wells.

4 The average concentration of naturally occurring organics is obtained by using the total organic carbon concentrations from the two upgradient wells MW-1A and MW-3 during each monitoring event.

5 The polar metabolic byproduct concentration is derived by [NWTPH-Dx (no SGC)] – [NWTPH-Dx (with SGC)] – [Background NWTPH-Dx (no SGC)] = polar metabolic byproduct concentration.

6 A Site-wide CUL of 700 µg/L may be applied for sites that have no detectable concentrations of petroleum hydrocarbons (i.e., no detects using NWTPH-Gx or -Dx with silica gel cleanup).

7 Total organic carbon by SM 5310C.

Abbreviations:

BTEX-N Benzene, toluene, ethylene, xylene, and naphthalene
°C Degrees Celsius
CAS Chemical Abstracts Service
CUL Cleanup level
ft Feet
µg/L Micrograms per liter
µS/cm Microsiemens per centimeter
mg/L Milligrams per liter
mV Millivolts
MTCA Model Toxics Control Act
ntu Nephelometric turbidity unit
ORP Oxidation–reduction potential
TPH Total petroleum hydrocarbons
VOC Volatile organic compound

Qualifiers:

J Analyte was detected; concentration is an estimate.
U Analyte was not detected at the associated reporting limit.
UJ Analyte was not detected at the associated reporting limit, which is an estimate.

Figures

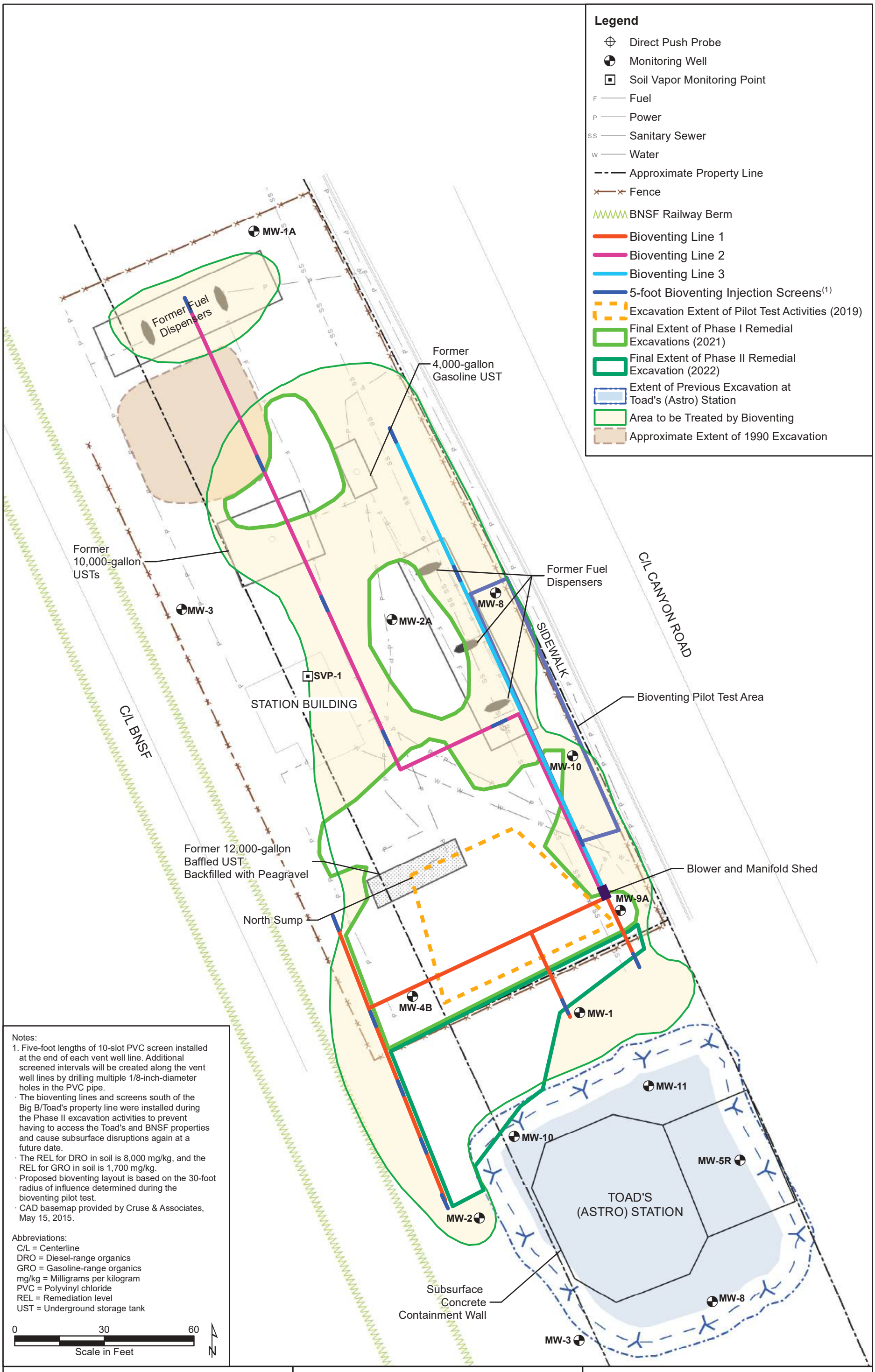
Note:
· Orthoimagery obtained from Esri, accessed 2022.

FLOYD | SNIDER
strategy • science • engineering

2024 Data Summary Memorandum
Big B Mini Mart Site
Ellensburg, Washington

Figure 1
Vicinity Map

I:\GIS\Projects\CL-Ellensburg\MXD\2024 Data Summary Memo\Figure 1 Vicinity Map.mxd
11/19/20204

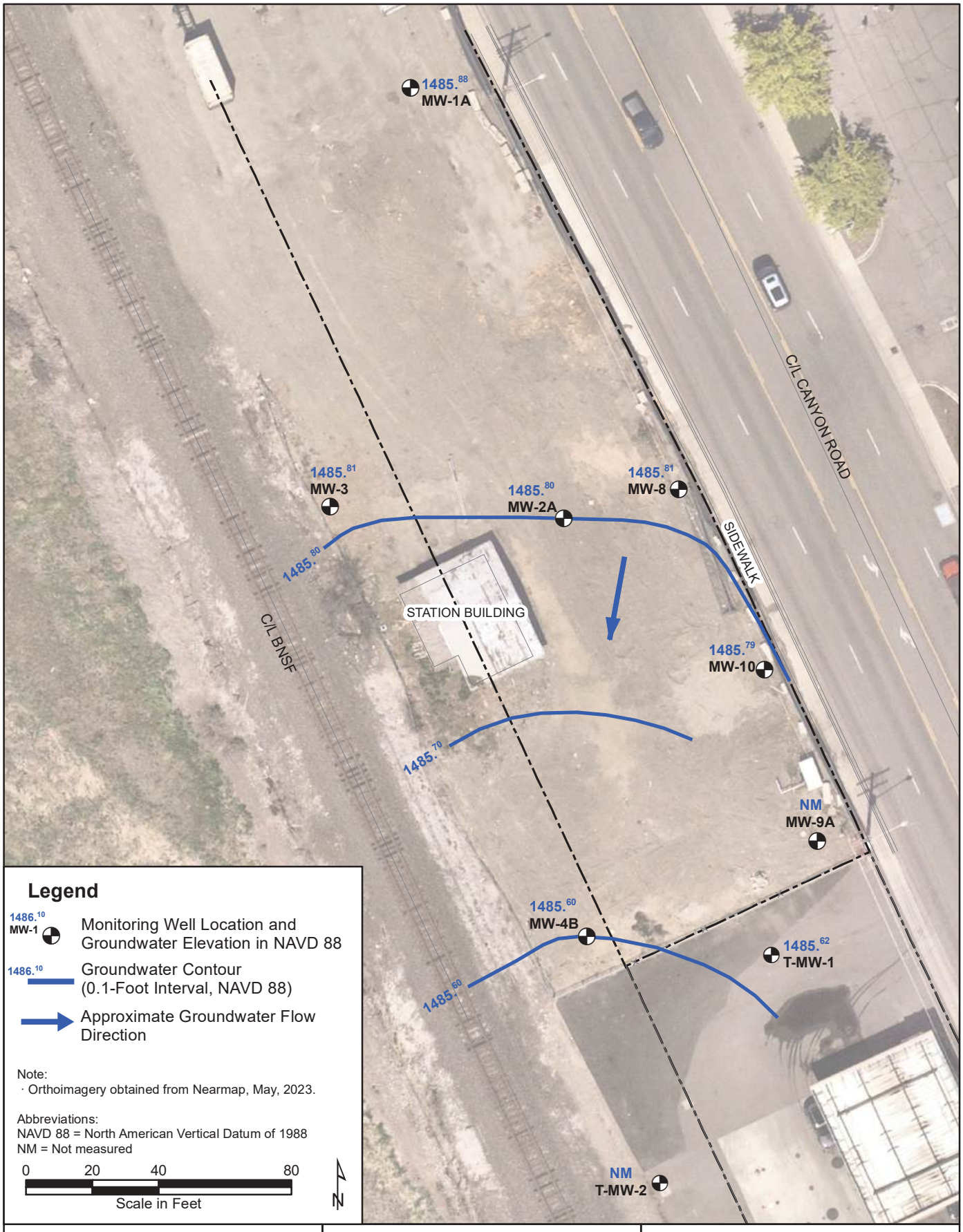


FLOYD | SNIDER
strategy ▪ science ▪ engineering

2024 Data Summary Memorandum
Big B Mini Mart Site
Ellensburg, Washington

Figure 2
Site Map

I:\GIS\Projects\CL-Ellensburg\MXD\2024 Data Summary Memo\Figure 2 Site Map.mxd
11/25/2024

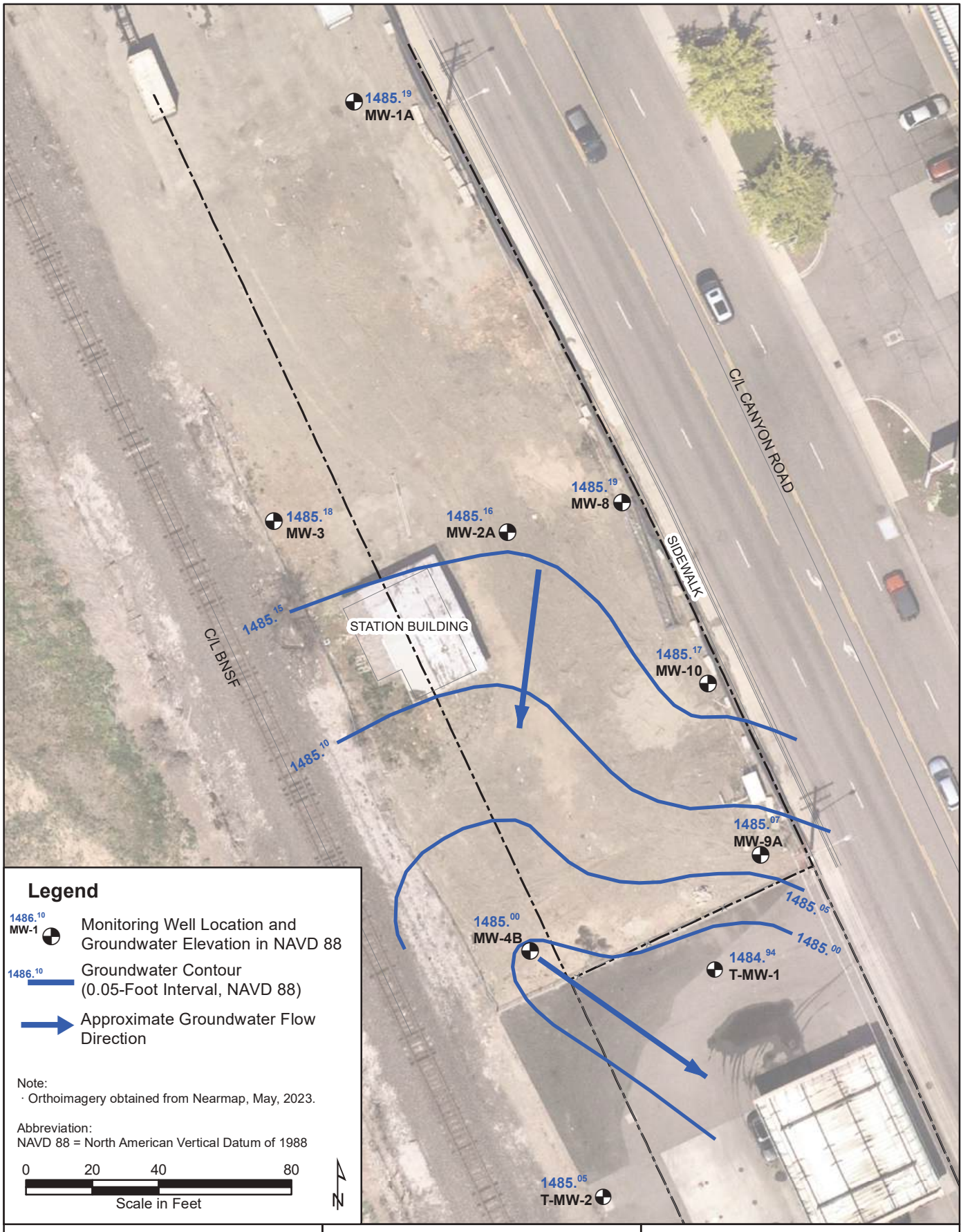


FLOYD | SNIDER
strategy • science • engineering

2024 Data Summary Memorandum
Big B Mini Mart Site
Ellensburg, Washington

Figure 3
Groundwater Elevation and Contour Map
May 7, 2024

I:\GIS\Projects\CL-Ellensburg\MXD\2024 Data Summary Memo\Figure 3 Groundwater Elevation and Contour Map May 7, 2024.mxd
11/25/2024



FLOYD | SNIDER
strategy · science · engineering

2024 Data Summary Memorandum
Big B Mini Mart Site
Ellensburg, Washington

Figure 4
Groundwater Elevation and Contour Map
September 10, 2024

I:\GIS\Projects\CL-Ellensburg\MXD\2024 Data Summary Memo\Figure 4 Groundwater Elevation and Contour Map September 10, 2024.mxd
11/25/2024

Attachment 1
Spring and Fall 2024 Laboratory Reports
and Groundwater Sampling Forms

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

July 16, 2024

Gabriel Cisneros, Project Manager
Floyd-Snider
Two Union Square
601 Union St, Suite 600
Seattle, WA 98101

Dear Mr Cisneros:

Included is the amended report from the testing of material submitted on May 8, 2024 from the Big B Ellensburg, F&BI 405132 project. The motor oil reporting for sample MW-3-050724 was lowered to 250 ug/L.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Floyd Snider Lab Data, Manique Talaia-Murray
FDS0517R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

May 17, 2024

Gabriel Cisneros, Project Manager
Floyd-Snider
Two Union Square
601 Union St, Suite 600
Seattle, WA 98101

Dear Mr Cisneros:

Included are the results from the testing of material submitted on May 8, 2024 from the Big B Ellensburg, F&BI 405132 project. There are 24 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Floyd Snider Lab Data, Manique Talaia-Murray
FDS0517R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 8, 2024 by Friedman & Bruya, Inc. from the Floyd-Snider Big B Ellensburg, F&BI 405132 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Floyd-Snider
405132 -01	MW-9A-050724
405132 -02	MW-2-050724
405132 -03	MW-1-050724
405132 -04	MW-101-050724
405132 -05	MW-3-050724
405132 -06	MW-1A-050724
405132 -07	MW-4B-050724
405132 -08	MW-2A-050724
405132 -09	Trip Blank-050724

Samples MW-1-050724, MW-101-050724, MW-3-050724, MW-1A-050724, MW-4B-050724, and MW-2A-050724 were sent to Fremont Analytical for dissolved methane, TOC, nitrate, and sulfate analyses. The report is enclosed.

All quality control requirements were acceptable.

Date of Report: 05/17/24
Date Received: 05/08/24
Project: Big B Ellensburg, F&BI 405132
Date Extracted: 05/09/24
Date Analyzed: 05/09/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
MW-9A-050724 405132-01	<100	88
MW-2-050724 405132-02	<100	86
MW-1-050724 405132-03	<100	90
MW-101-050724 405132-04	<100	88
MW-4B-050724 405132-07	360	90
MW-2A-050724 405132-08	410	90
Method Blank 04-884 MB	<100	84

Date of Report: 05/17/24
Date Received: 05/08/24
Project: Big B Ellensburg, F&BI 405132
Date Extracted: 05/09/24
Date Analyzed: 05/14/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx
Sample Extracts Passed Through a Silica Gel Column Prior to Analysis
Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW-9A-050724 405132-01	<50	<250	113
MW-2-050724 405132-02	640	<250	118
MW-1-050724 405132-03	130	<250	112
MW-101-050724 405132-04	120	<250	118
MW-3-050724 405132-05	<50	<250	105
MW-1A-050724 405132-06	<50	<250	106
MW-4B-050724 405132-07	510 x	<250	109
MW-2A-050724 405132-08	<50	<250	111
Method Blank 04-1126 MB	<50	<250	101

Date of Report: 05/17/24
Date Received: 05/08/24
Project: Big B Ellensburg, F&BI 405132
Date Extracted: 05/09/24
Date Analyzed: 05/09/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
MW-9A-050724 405132-01	160 x	<250	116
MW-2-050724 405132-02	6,400 x	700 x	114
MW-1-050724 405132-03	1,000 x	<250	126
MW-101-050724 405132-04	1,100 x	<250	129
MW-3-050724 405132-05	430 x	<250	123
MW-1A-050724 405132-06	110 x	<250	118
MW-4B-050724 405132-07	5,300 x	530 x	112
MW-2A-050724 405132-08	1,200 x	<250	123
Method Blank 04-1126 MB	<50	<250	112

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW-9A-050724	Client:	Floyd-Snider
Date Received:	05/08/24	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	405132-01
Date Analyzed:	05/08/24	Data File:	050821.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	78	126
Toluene-d8	100	84	115
4-Bromofluorobenzene	98	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW-2-050724	Client:	Floyd-Snider
Date Received:	05/08/24	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	405132-02
Date Analyzed:	05/08/24	Data File:	050822.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	95	78	126
Toluene-d8	97	84	115
4-Bromofluorobenzene	97	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW-1-050724	Client:	Floyd-Snider
Date Received:	05/08/24	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	405132-03
Date Analyzed:	05/08/24	Data File:	050823.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	78	126
Toluene-d8	98	84	115
4-Bromofluorobenzene	96	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW-101-050724	Client:	Floyd-Snider
Date Received:	05/08/24	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	405132-04
Date Analyzed:	05/08/24	Data File:	050824.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	78	126
Toluene-d8	99	84	115
4-Bromofluorobenzene	98	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW-4B-050724	Client:	Floyd-Snider
Date Received:	05/08/24	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	405132-07
Date Analyzed:	05/08/24	Data File:	050825.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	78	126
Toluene-d8	99	84	115
4-Bromofluorobenzene	98	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW-2A-050724	Client:	Floyd-Snider
Date Received:	05/08/24	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	405132-08
Date Analyzed:	05/08/24	Data File:	050826.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	93	78	126
Toluene-d8	97	84	115
4-Bromofluorobenzene	101	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	04-1066 mb
Date Analyzed:	05/08/24	Data File:	050809.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	78	126
Toluene-d8	97	84	115
4-Bromofluorobenzene	98	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-1-050724	Client:	Floyd-Snider
Date Received:	05/08/24	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	405132-03 x20
Date Analyzed:	05/09/24	Data File:	405132-03 x20.075
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	730

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-101-050724	Client:	Floyd-Snider
Date Received:	05/08/24	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	405132-04 x20
Date Analyzed:	05/09/24	Data File:	405132-04 x20.076
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	730

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-3-050724	Client:	Floyd-Snider
Date Received:	05/08/24	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	405132-05 x20
Date Analyzed:	05/09/24	Data File:	405132-05 x20.088
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	290

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-1A-050724	Client:	Floyd-Snider
Date Received:	05/08/24	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	405132-06 x20
Date Analyzed:	05/09/24	Data File:	405132-06 x20.192
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	41

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-4B-050724	Client:	Floyd-Snider
Date Received:	05/08/24	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	405132-07 x20
Date Analyzed:	05/09/24	Data File:	405132-07 x20.193
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	1,100

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-2A-050724	Client:	Floyd-Snider
Date Received:	05/08/24	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	405132-08 x20
Date Analyzed:	05/09/24	Data File:	405132-08 x20.194
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	710

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	NA	Project:	Big B Ellensburg, F&BI 405132
Date Extracted:	05/08/24	Lab ID:	I4-374 mb
Date Analyzed:	05/08/24	Data File:	I4-374 mb.097
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	<1

Date of Report: 05/17/24
Date Received: 05/08/24
Project: Big B Ellensburg, F&BI 405132

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 405132-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	96	70-130

Date of Report: 05/17/24
Date Received: 05/08/24
Project: Big B Ellensburg, F&BI 405132

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

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	88	96	65-151	9

Date of Report: 05/17/24
Date Received: 05/08/24
Project: Big B Ellensburg, F&BI 405132

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	96	104	65-151	8

Date of Report: 05/17/24
Date Received: 05/08/24
Project: Big B Ellensburg, F&BI 405132

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 405104-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Benzene	ug/L (ppb)	10	<0.35	99	50-150
Toluene	ug/L (ppb)	10	<1	99	50-150
Ethylbenzene	ug/L (ppb)	10	<1	100	50-150
m,p-Xylene	ug/L (ppb)	20	<2	99	50-150
o-Xylene	ug/L (ppb)	10	<1	99	50-150
Naphthalene	ug/L (ppb)	10	<1	95	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	10	99	97	70-130	2
Toluene	ug/L (ppb)	10	102	97	70-130	5
Ethylbenzene	ug/L (ppb)	10	103	99	70-130	4
m,p-Xylene	ug/L (ppb)	20	102	98	70-130	4
o-Xylene	ug/L (ppb)	10	101	96	70-130	5
Naphthalene	ug/L (ppb)	10	90	83	70-130	8

Date of Report: 05/17/24
Date Received: 05/08/24
Project: Big B Ellensburg, F&BI 405132

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 405126-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Manganese	ug/L (ppb)	20	239	142 b	174 b	75-125	20 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Manganese	ug/L (ppb)	20	100	80-120

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

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

405132

Gabe Cisneros

SAMPLE CHAIN OF CUSTODY

05/08/24 VW4/K3/F3

Page # 1 of 1

Report To Manique Talaia Murray

Company Floyd Snider

Address 601 Union St, Ste 600

City, State, ZIP Seattle, WA 98101

Phone (206) 292-2078 Email gabe.cisneros@floydsnider.com; manique.talaia-murray@floydsnider.com

SAMPLERS (*signature*): Daniel Gallardo VW BAD

PROJECT NAME: Big B Ellensburg

PO #:

REMARKS:

Project specific RLs? - Yes / No

INVOICE TO:

TURNAROUND TIME
- [x] Standard turnaround
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Archive samples
- [ ] Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED (2) NWTPH-Dx (1)	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260 (3)	PAHs EPA 8270	PCBs EPA 8082	TOC	Nitrate/Sulfate	Manganese, D35	Methane	Notes
MW-9A-050724	01 A-G	5/7/24	11:00	GW	7	X	X			X							(1) Dx with & w/o SG
MW-2-050724	02 A-G	5/7/24	12:05	GW	7	X	X			X							(2) Field Filtered
MW-1-050724	03 A-M	5/7/24	12:15	GW	13	X	X			X			X	X	X	X	(3) only BTEX & Naphthalene
MW-101-050724	04 A-M	5/7/24	12:30	GW	13	X	X			X			X	X	X	X	
MW-3-050724	05 A-G	5/7/24	13:45	GW	7	X							X	X	X	X	
MW-1A-050724	06 A-G	5/7/24	13:45	GW	7	X							X	X	X	X	
MW-4B-050724	07 A-M	5/7/24	14:45	GW	13	X	X			X			X	X	X	X	
MW-2A-050724	08 A-M	5/7/24	14:50	GW	13	X	X			X			X	X	X	X	
TripBlank-050724	09 A-B	5/7/24	08:00	W	2												

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: BAD VW	Henry Bates	FS	5/8/24	0900
Received by:	Eal Young	FSB	5/8/24	0900
Relinquished by:				
Received by:		Samples received at 4 °C		

Friedman & Bruya, Inc.
Ph. (206) 285-8282

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 405132 CLIENT FDS INITIALS/DATE: E 5/8/21

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 4 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 1 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ~~☐ YES~~ (NP) ☐ NO

Are samples requiring no headspace, headspace free? ☐ NA ☑ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes ☐ No	
Date Sampled	☑ Yes ☐ No	☐ Not on COC/label
Time Sampled	☑ Yes ☐ No	☐ Not on COC/label
# of Containers	☑ Yes ☐ No	☐ Not on COC/label
Relinquished	☑ Yes ☐ No	
Requested analysis	☑ Yes ☐ On Hold	

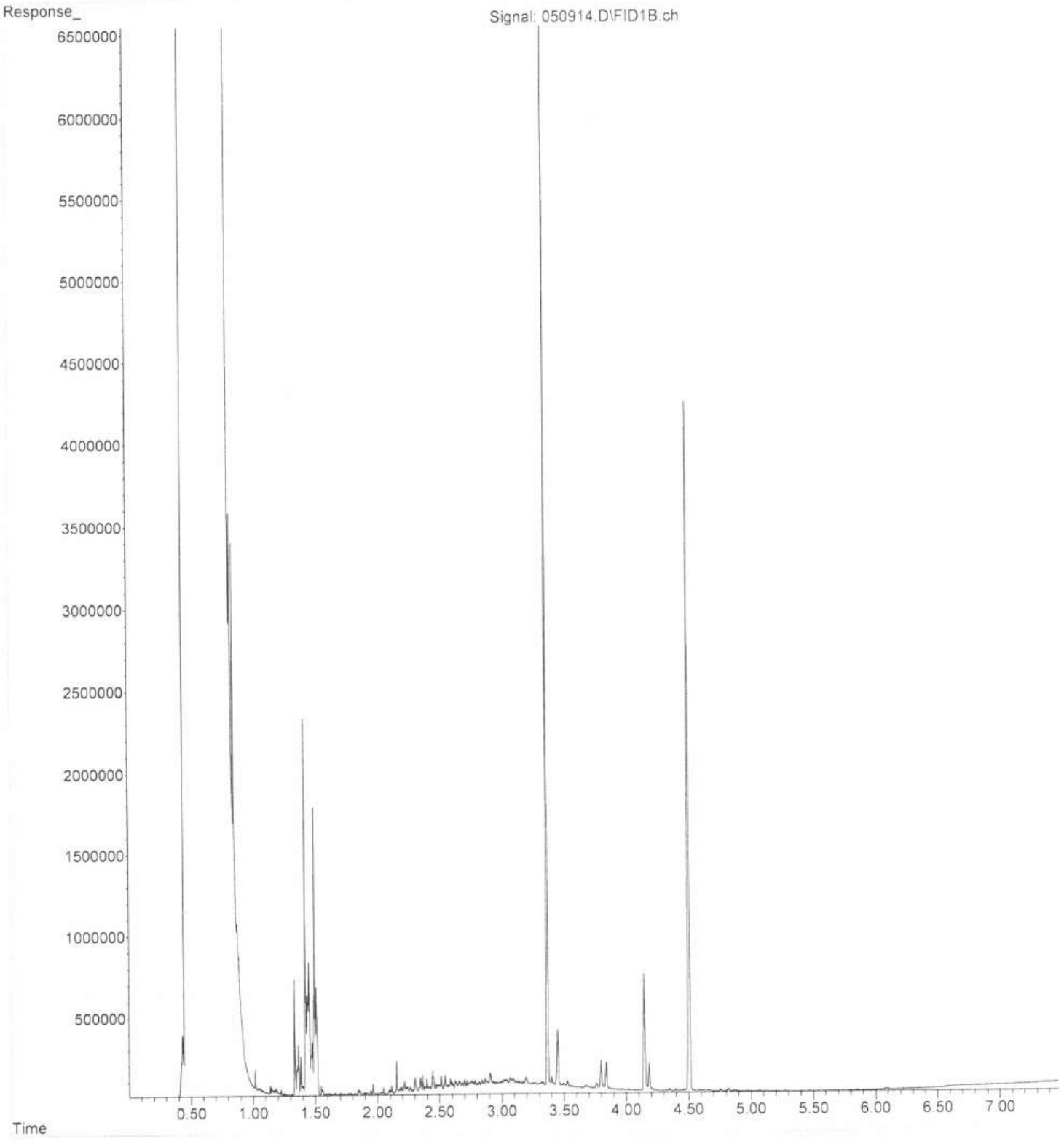
Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters _____ **Number of unused TO17 tubes** _____

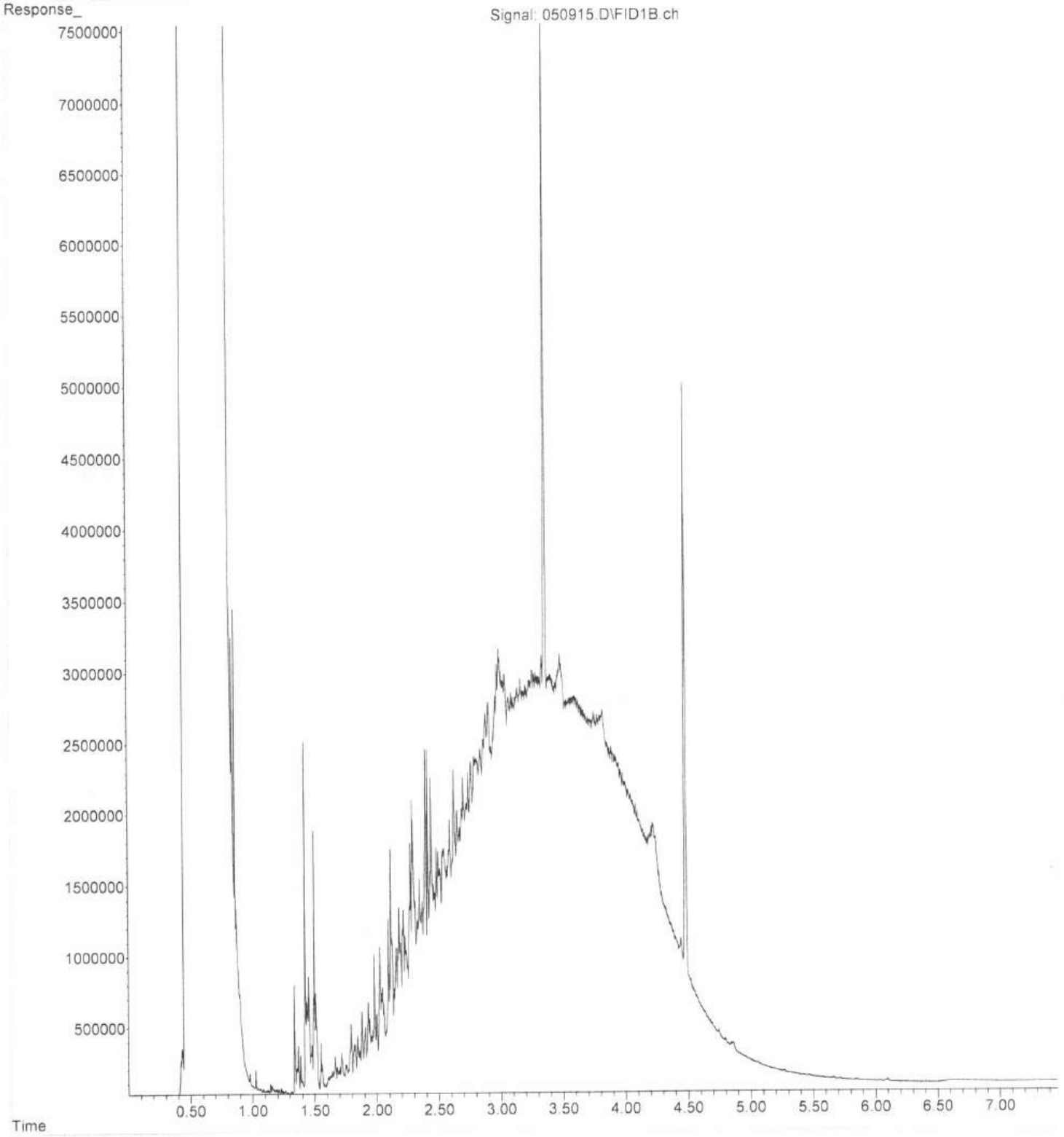
File :P:\Proc_GC14\05-09-24\050914.D
Operator : TL
Acquired : 09 May 2024 03:21 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-01
Misc Info :
Vial Number: 14

ERR



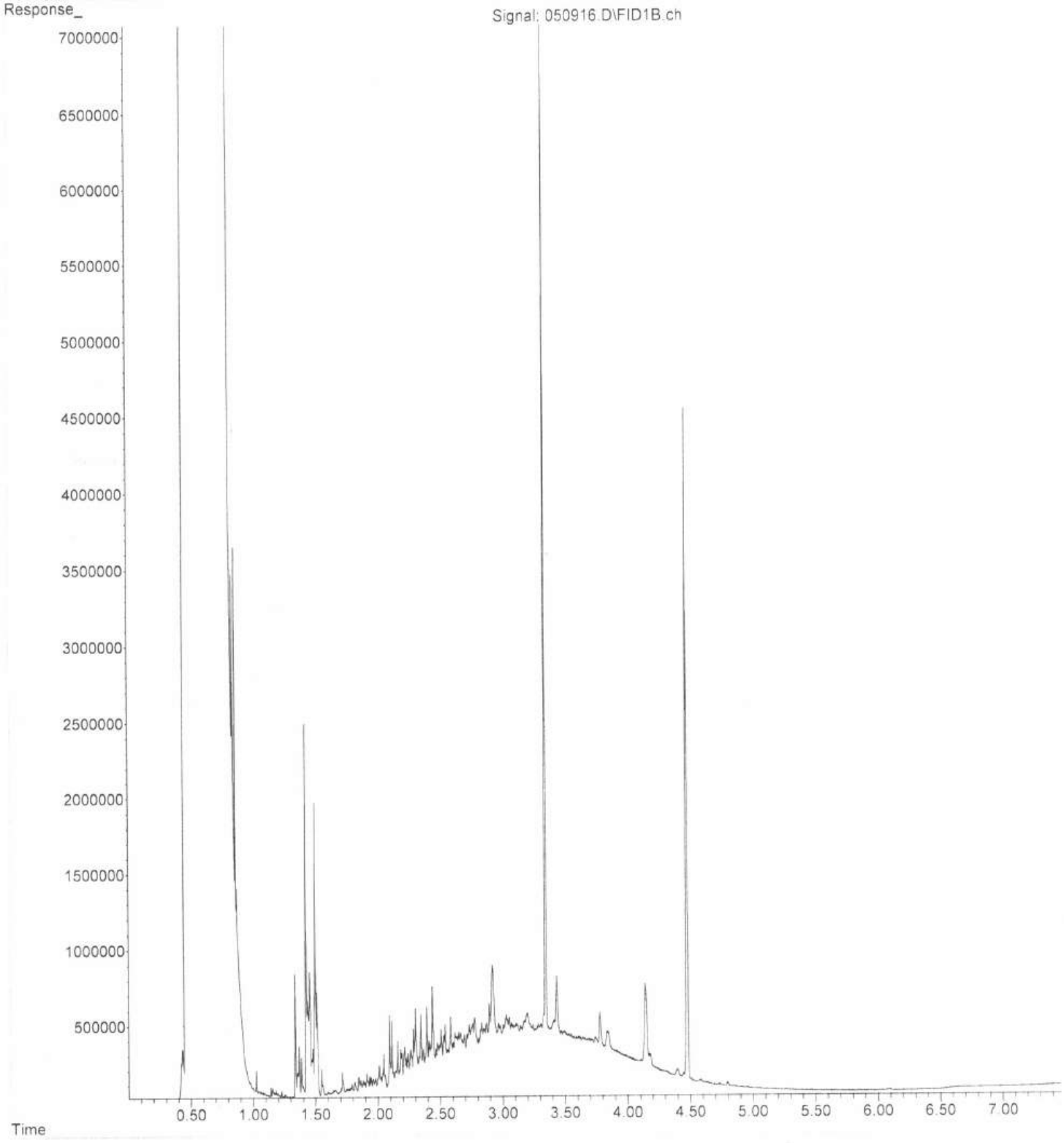
File :P:\Proc_GC14\05-09-24\050915.D
Operator : TL
Acquired : 09 May 2024 03:33 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-02
Misc Info :
Vial Number: 15

ERR



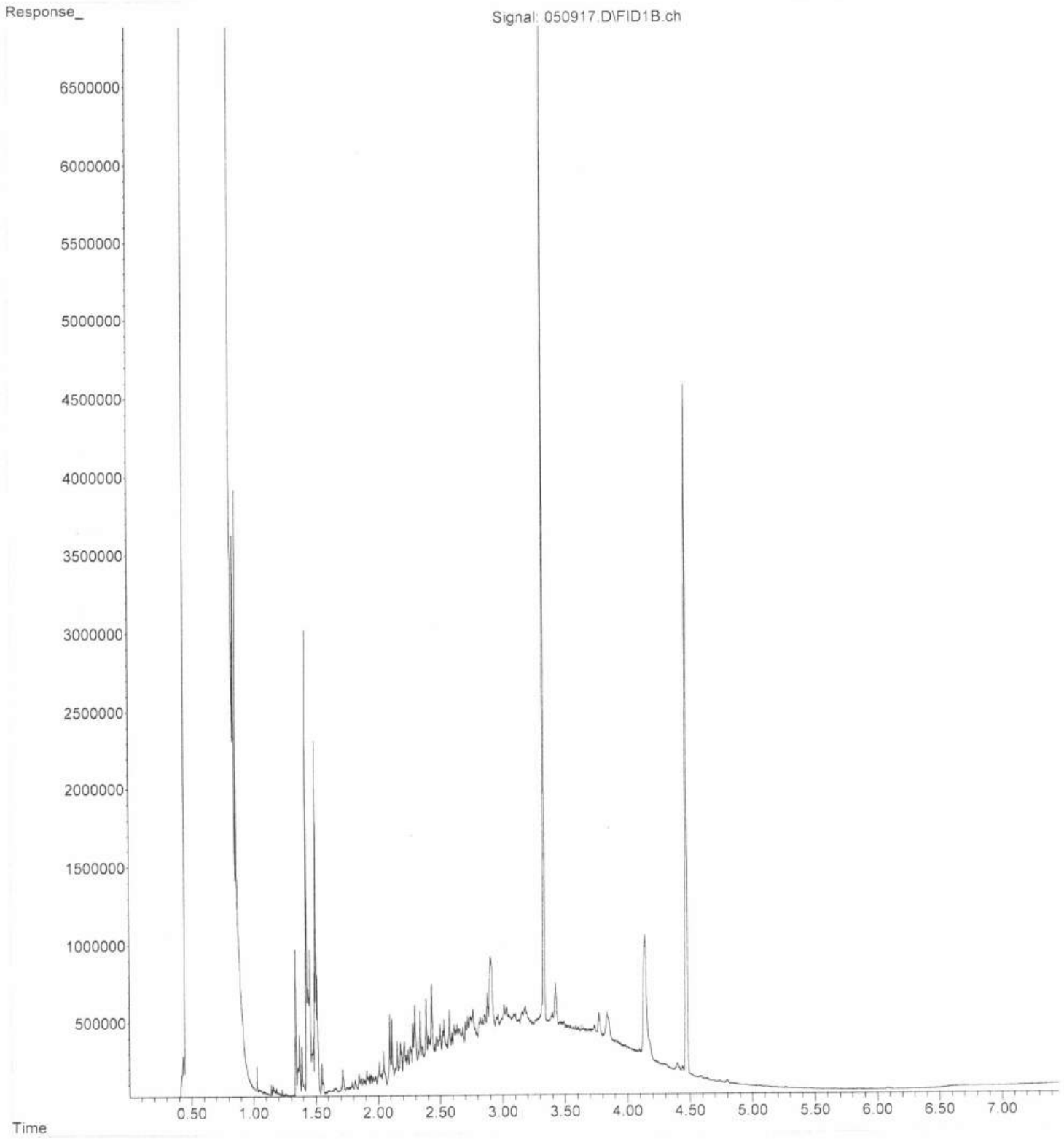
File :P:\Proc_GC14\05-09-24\050916.D
Operator : TL
Acquired : 09 May 2024 03:45 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-03
Misc Info :
Vial Number: 16

ERR



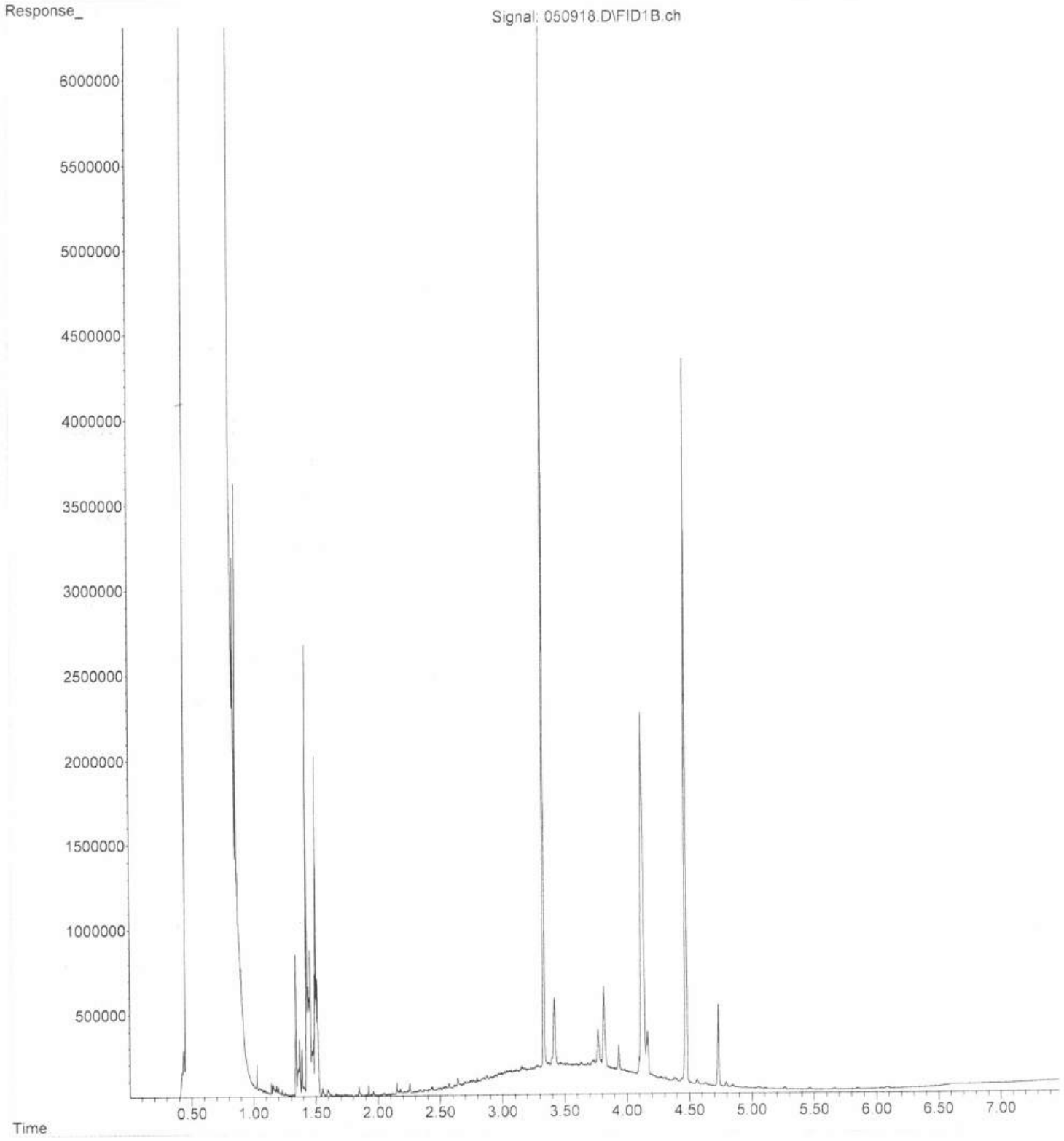
File :P:\Proc_GC14\05-09-24\050917.D
Operator : TL
Acquired : 09 May 2024 03:57 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-04
Misc Info :
Vial Number: 17

ERR



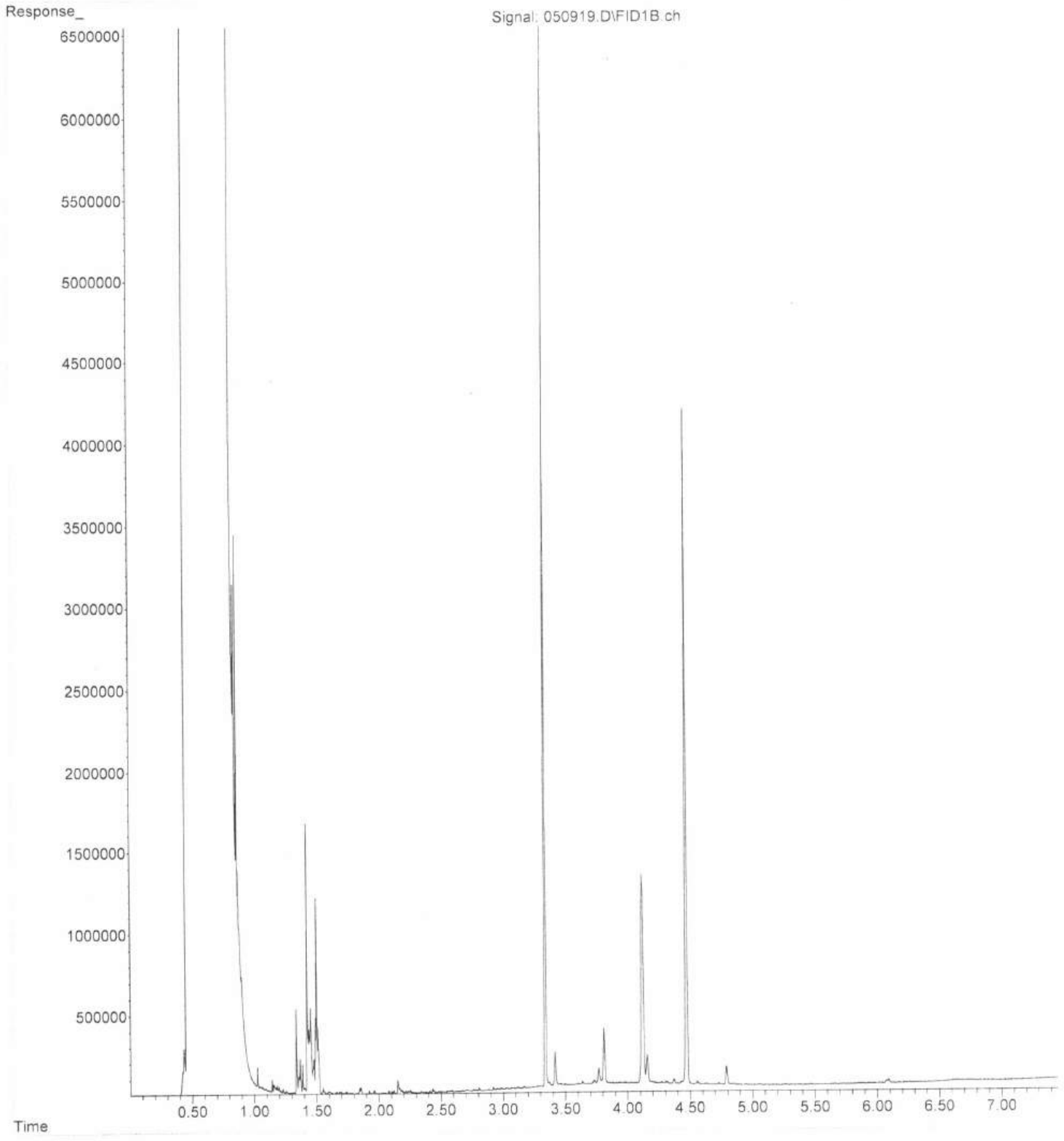
File :P:\Proc_GC14\05-09-24\050918.D
Operator : TL
Acquired : 09 May 2024 04:08 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-05
Misc Info :
Vial Number: 18

ERR



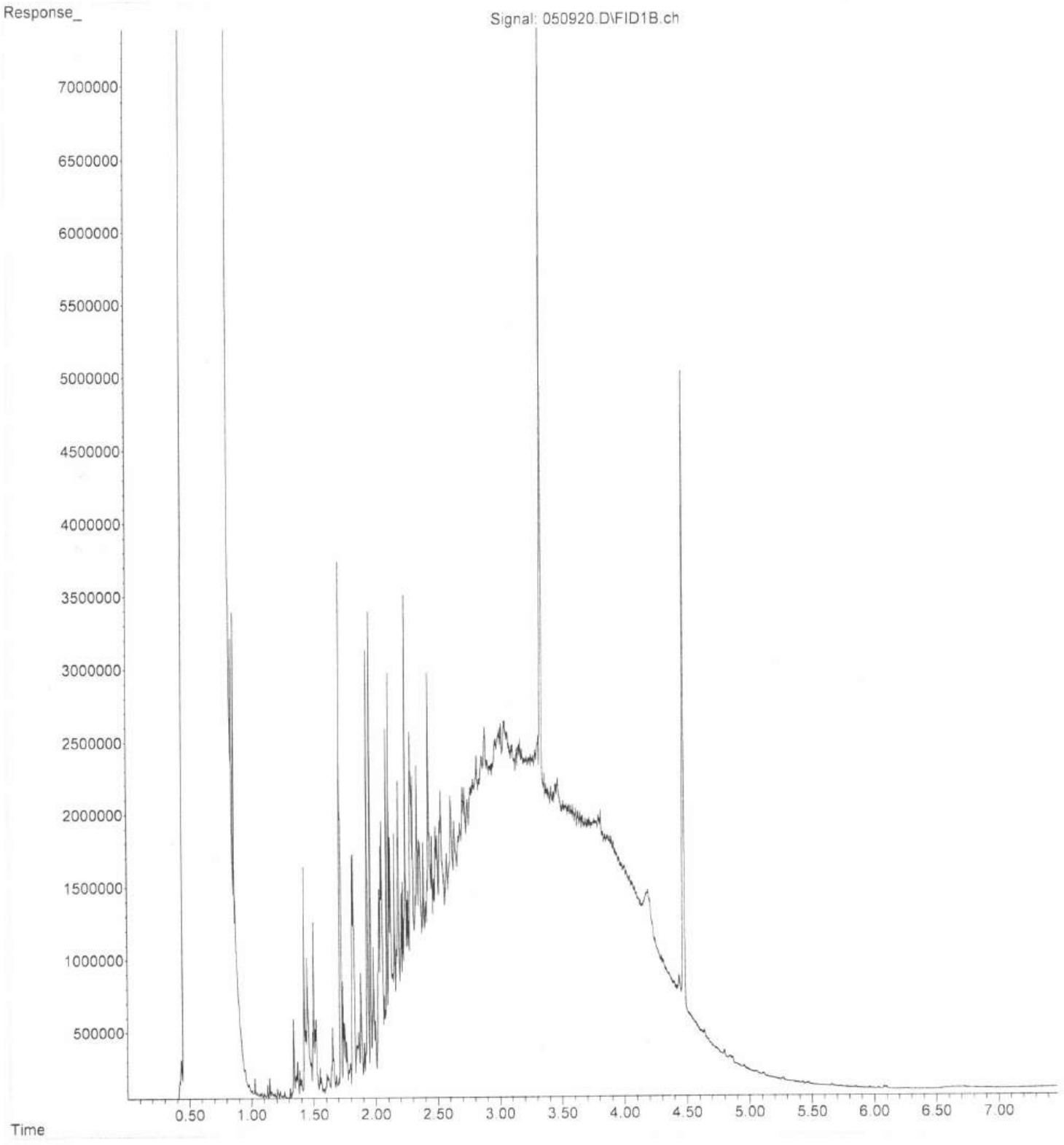
File : P:\Proc_GC14\05-09-24\050919.D
Operator : TL
Acquired : 09 May 2024 04:20 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-06
Misc Info :
Vial Number: 19

ERR



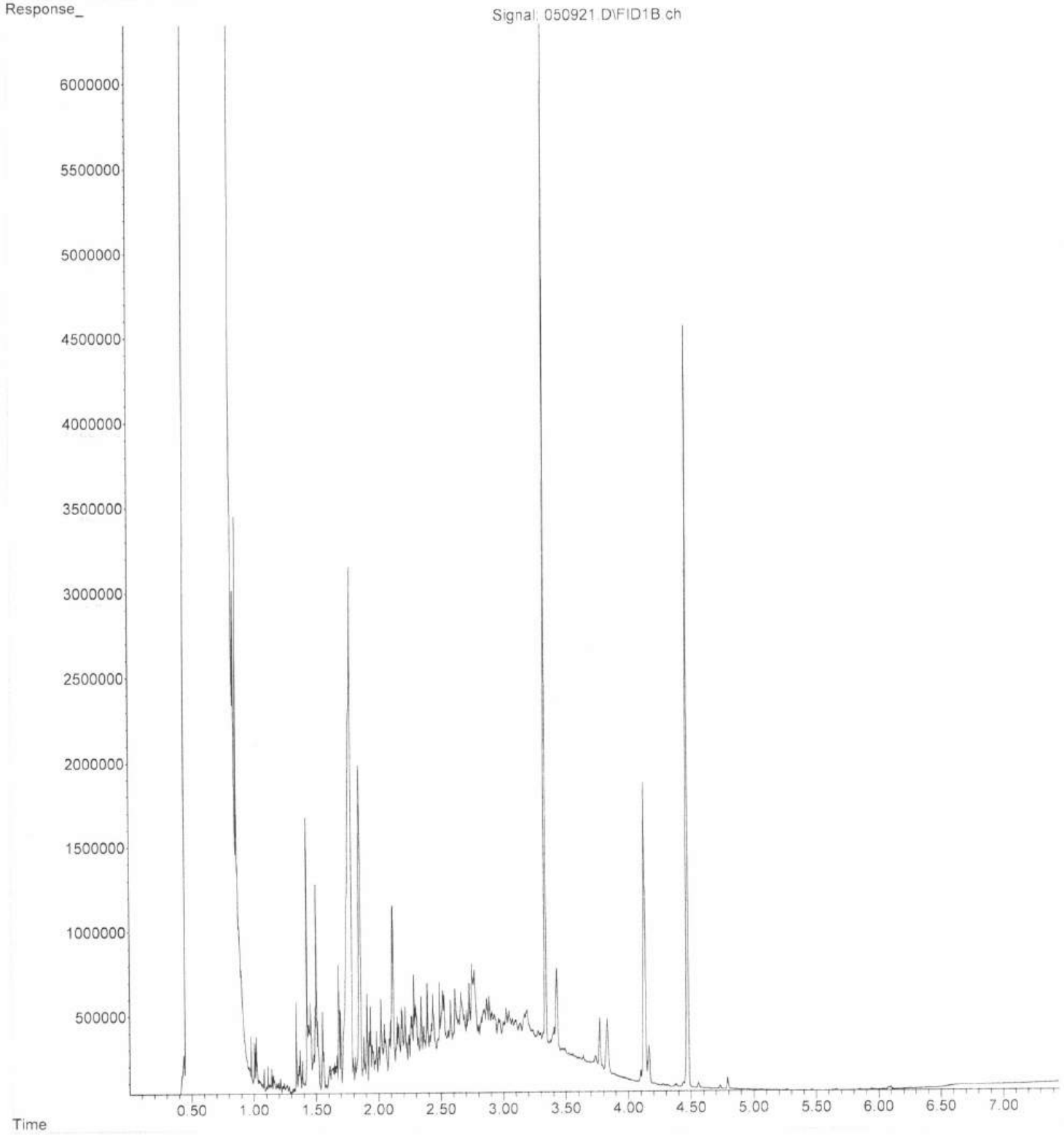
File :P:\Proc_GC14\05-09-24\050920.D
Operator : TL
Acquired : 09 May 2024 04:32 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-07
Misc Info :
Vial Number: 20

ERR



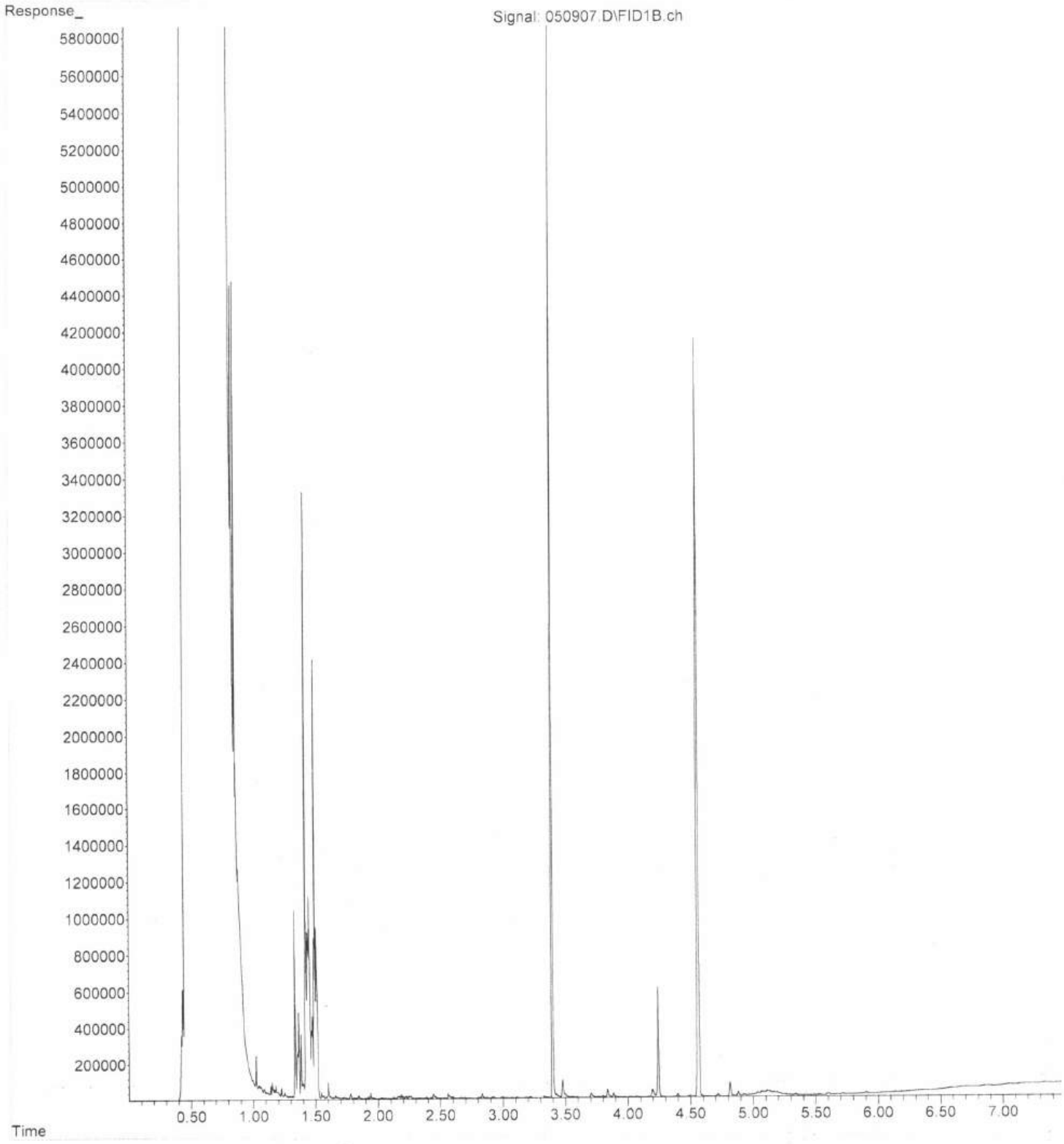
File :P:\Proc_GC14\05-09-24\050921.D
Operator : TL
Acquired : 09 May 2024 04:44 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-08
Misc Info :
Vial Number: 21

ERR

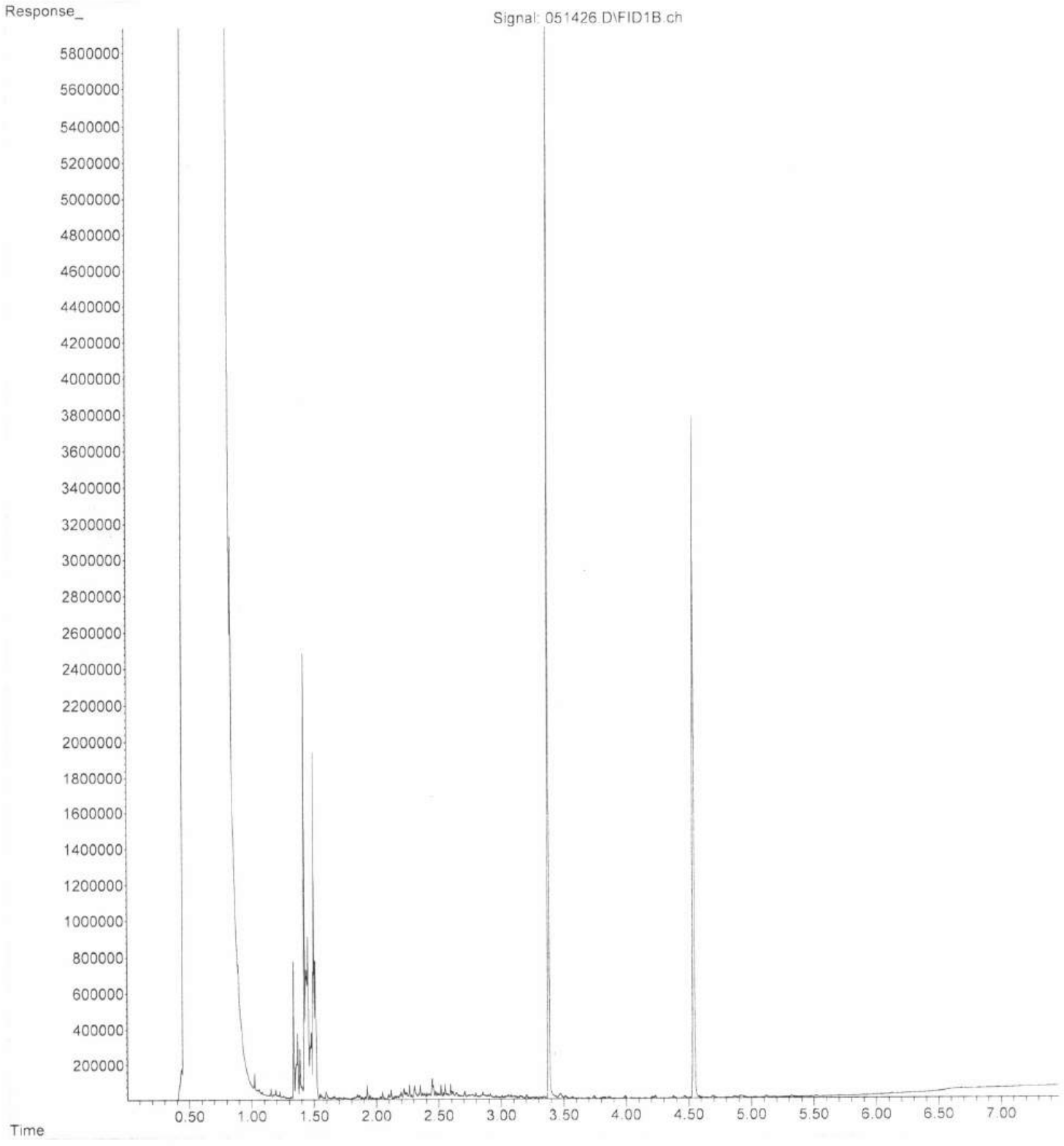


File :P:\Proc_GC14\05-09-24\050907.D
Operator : TL
Acquired : 09 May 2024 01:57 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 04-1126 mb
Misc Info :
Vial Number: 9

ERR

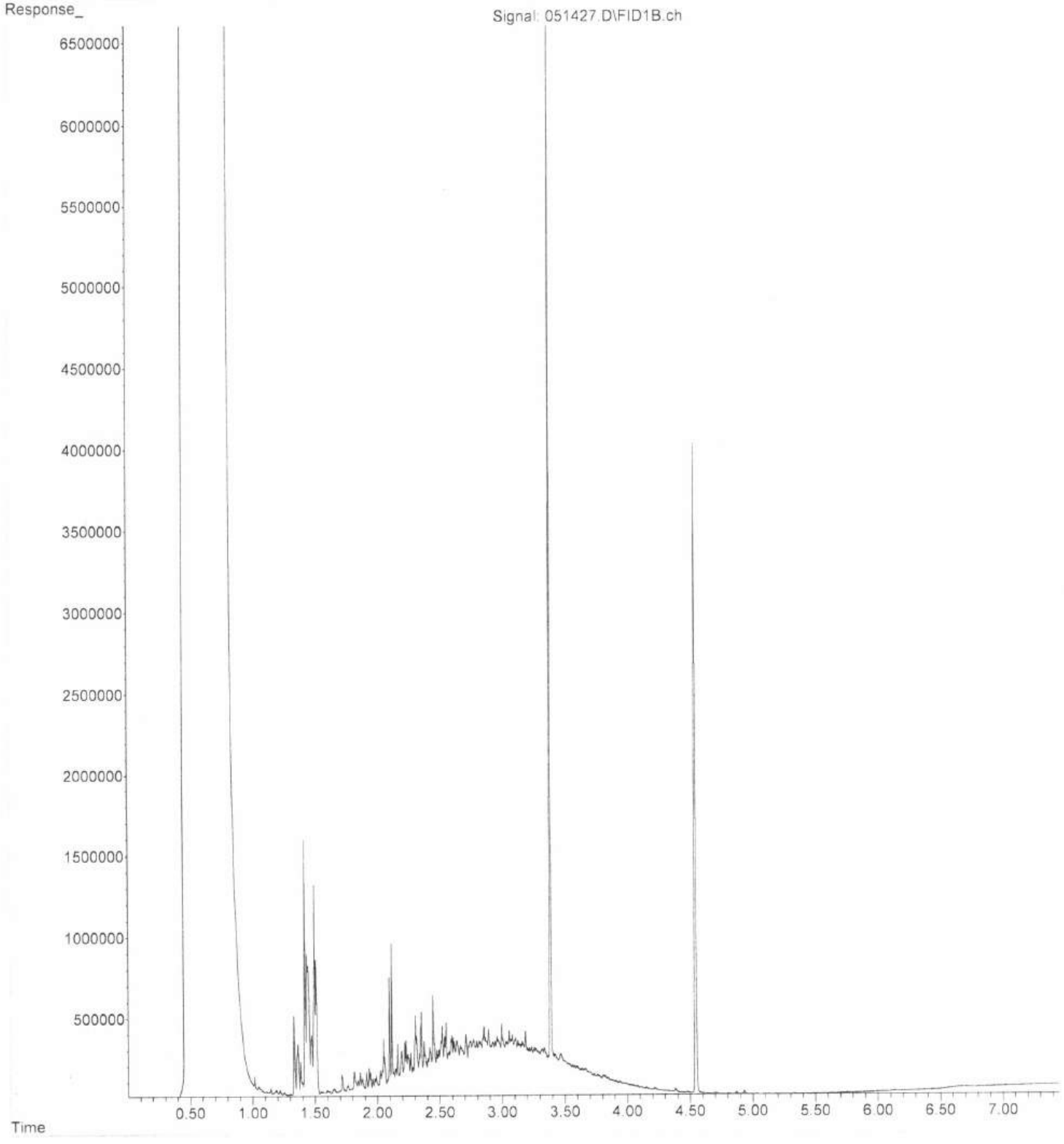


File : P:\Proc_GC14\05-14-24\051426.D
Operator : TL
Acquired : 14 May 2024 01:26 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-01 sg rr
Misc Info : ERR
Vial Number: 25

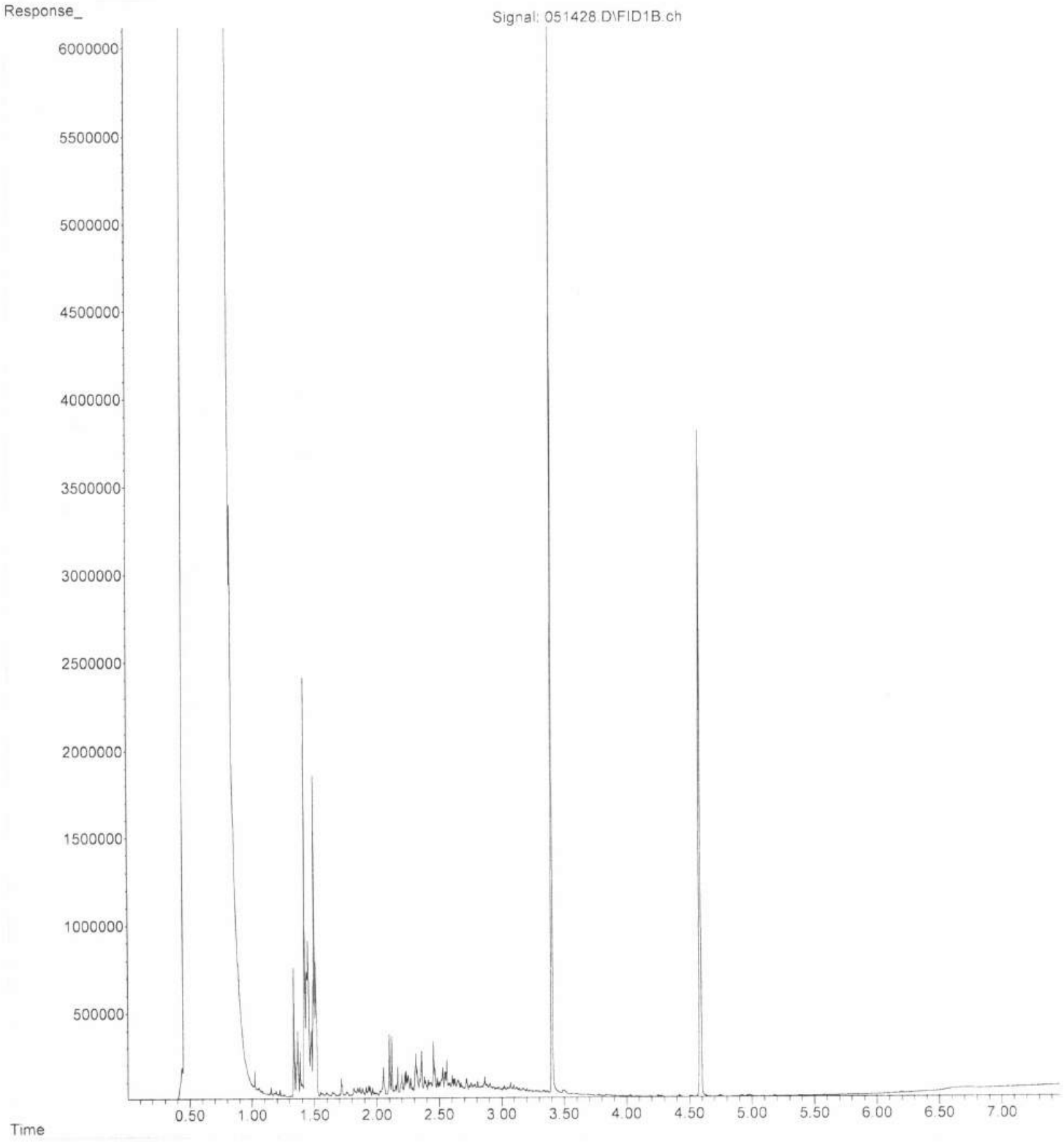


File :P:\Proc_GC14\05-14-24\051427.D
Operator : TL
Acquired : 14 May 2024 01:38 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-02 sg rr
Misc Info :
Vial Number: 26

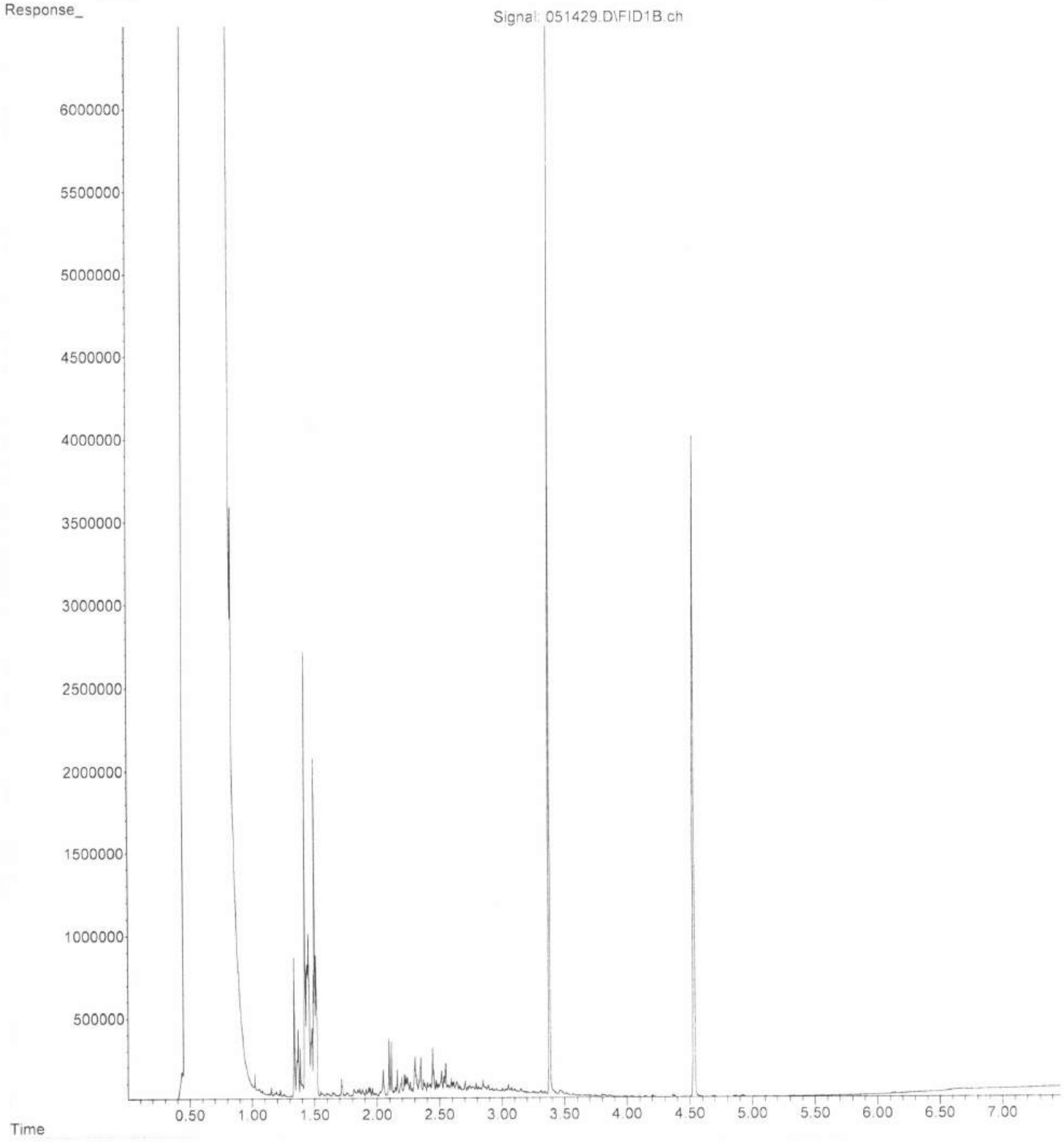
ERR



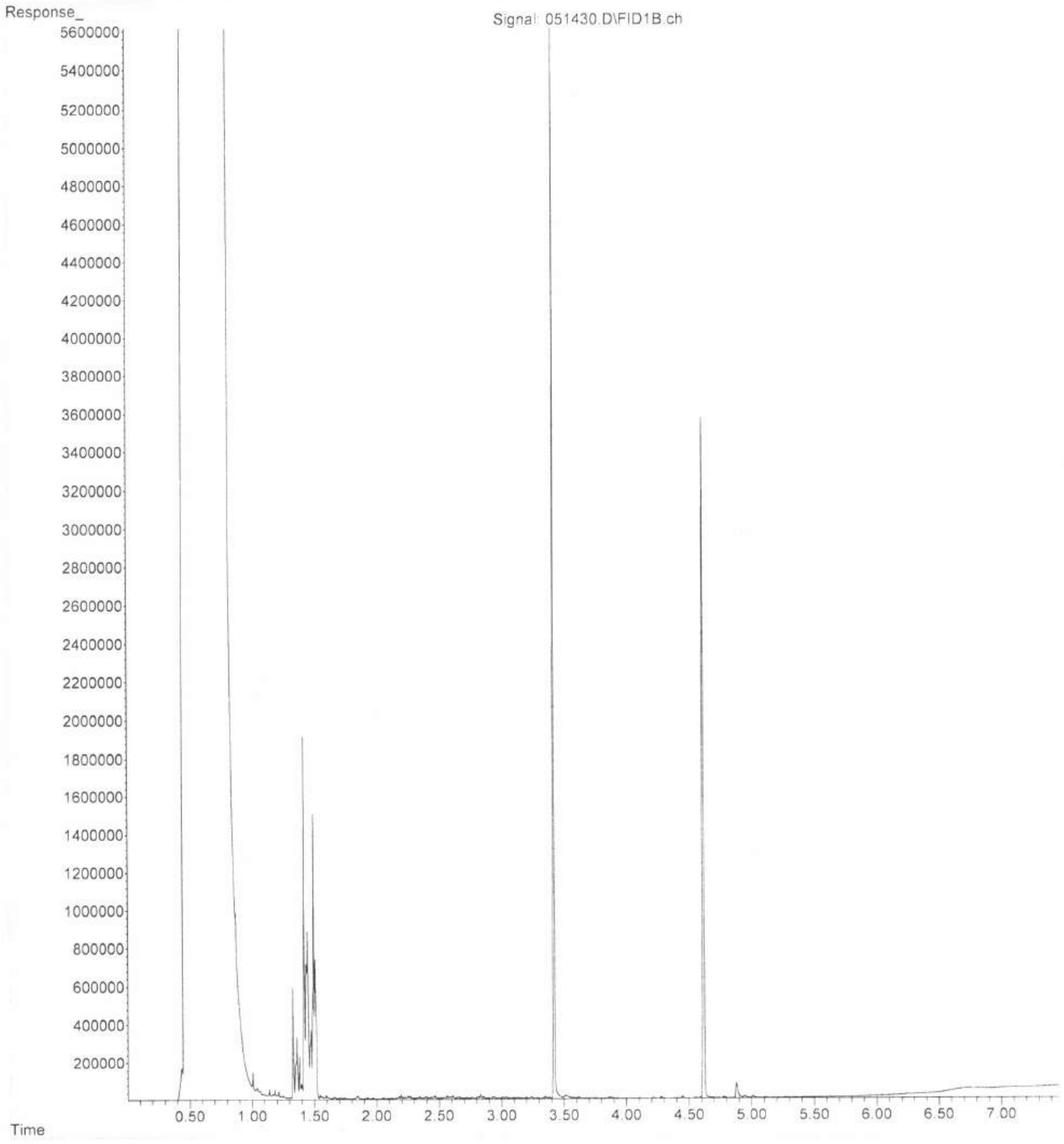
File :P:\Proc_GC14\05-14-24\051428.D
Operator : TL
Acquired : 14 May 2024 01:50 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-03 sg rr
Misc Info : ERR
Vial Number: 27



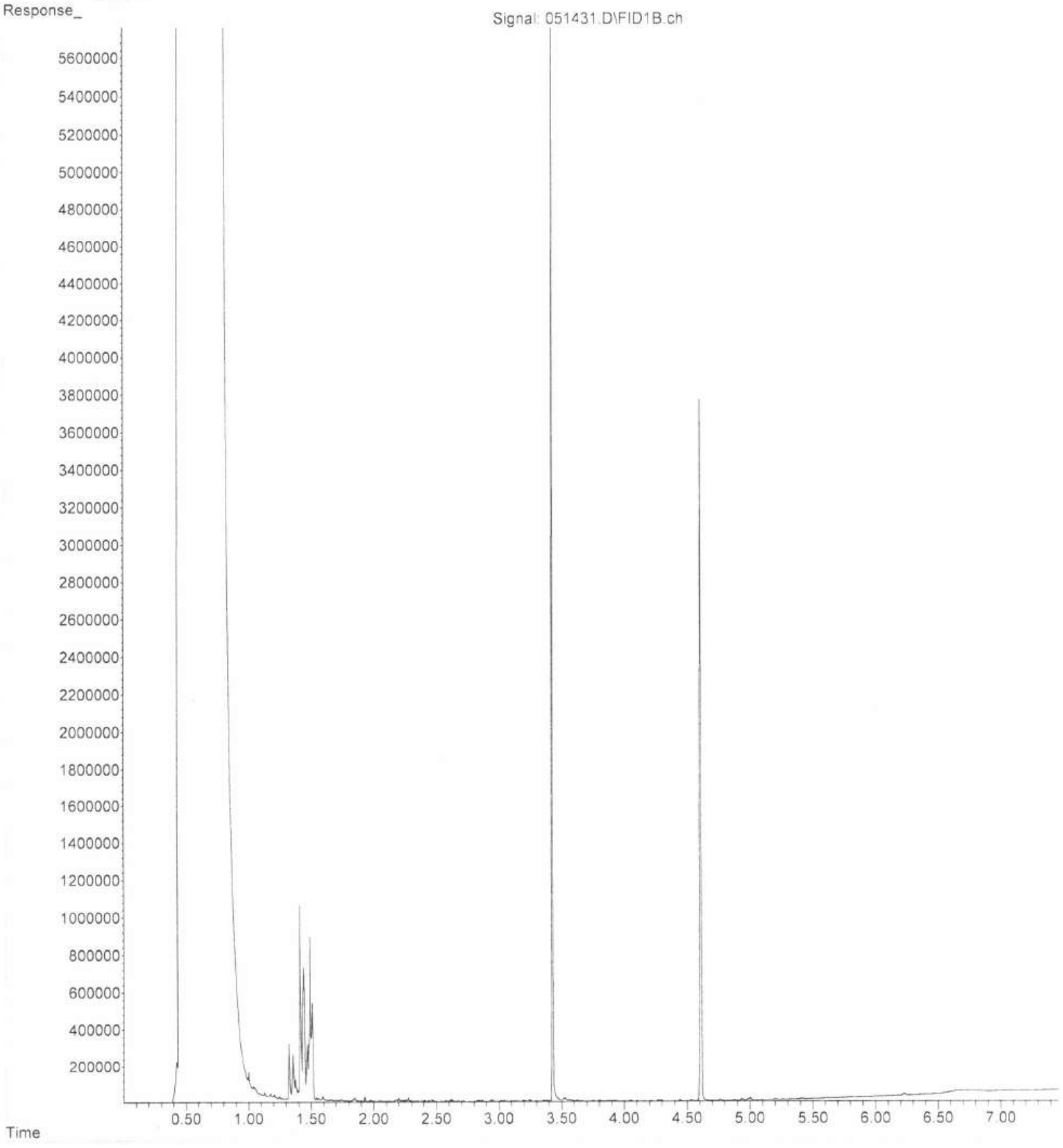
File :P:\Proc_GC14\05-14-24\051429.D
Operator : TL
Acquired : 14 May 2024 02:02 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-04 sg rr
Misc Info : ERR
Vial Number: 28



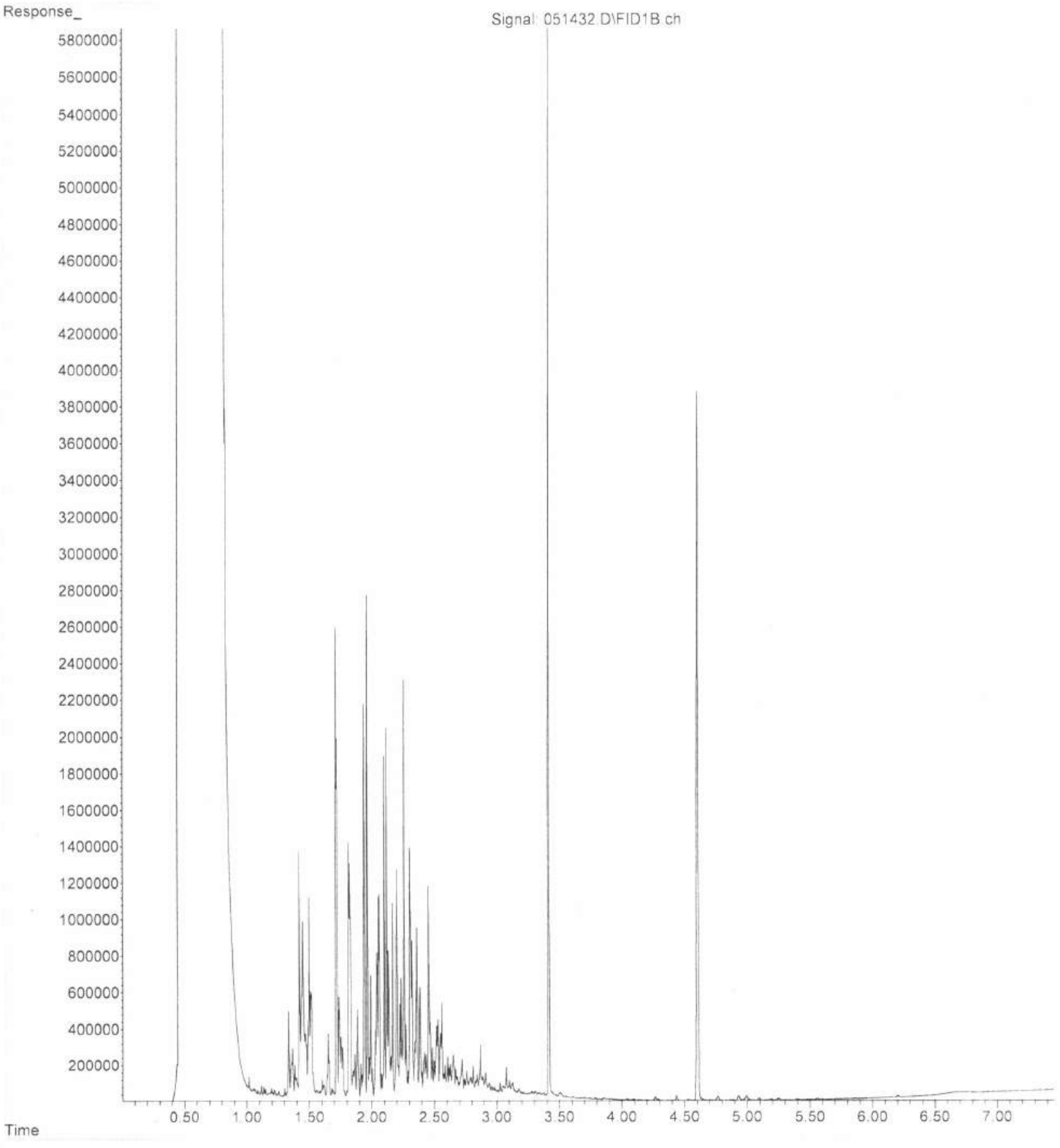
File :P:\Proc_GC14\05-14-24\051430.D
Operator : TL
Acquired : 14 May 2024 02:14 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-05 sg rr
Misc Info : ERR
Vial Number: 29



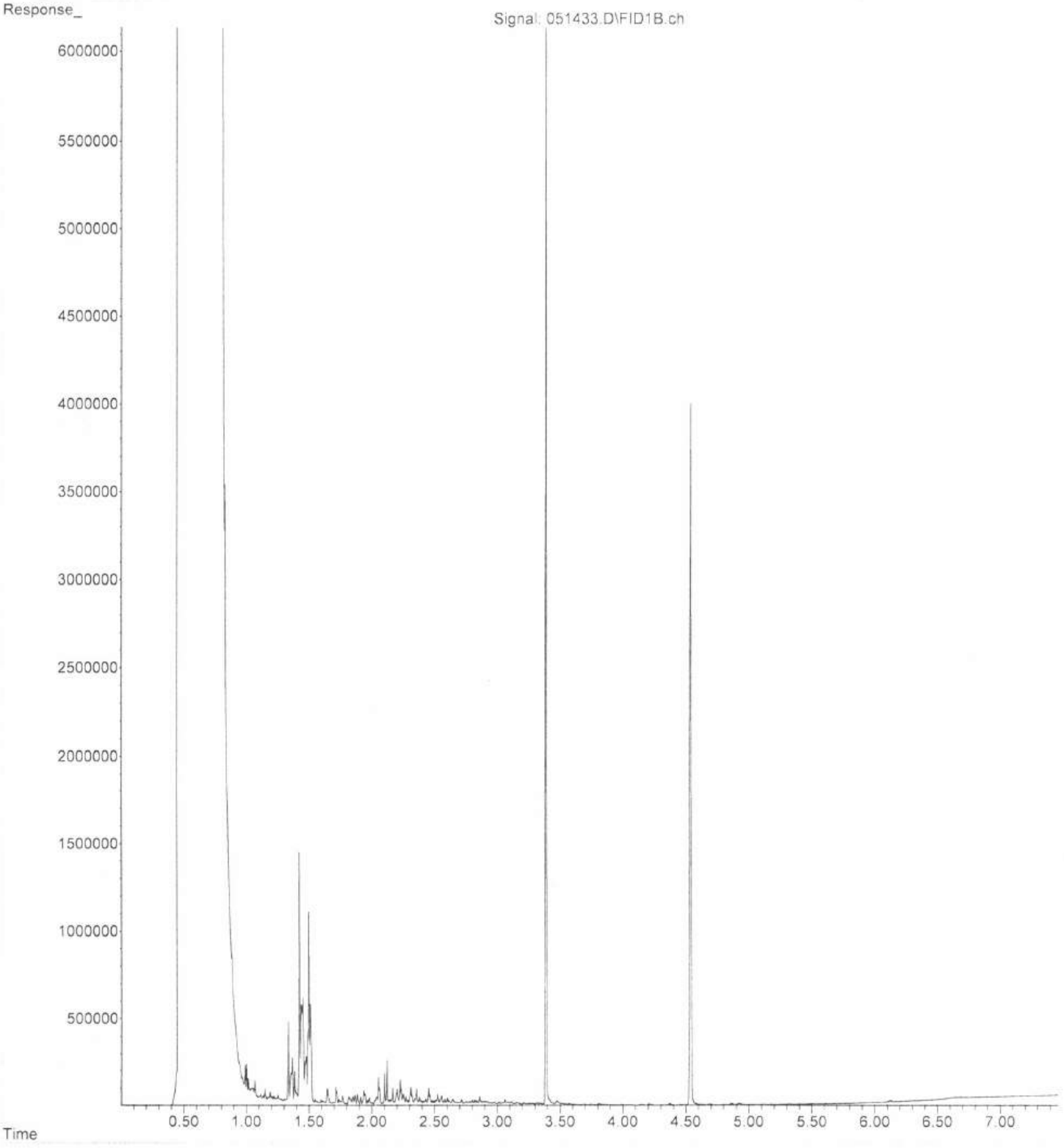
File : P:\Proc_GC14\05-14-24\051431.D
Operator : TL
Acquired : 14 May 2024 02:26 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-06 sg rr
Misc Info : ERR
Vial Number: 30



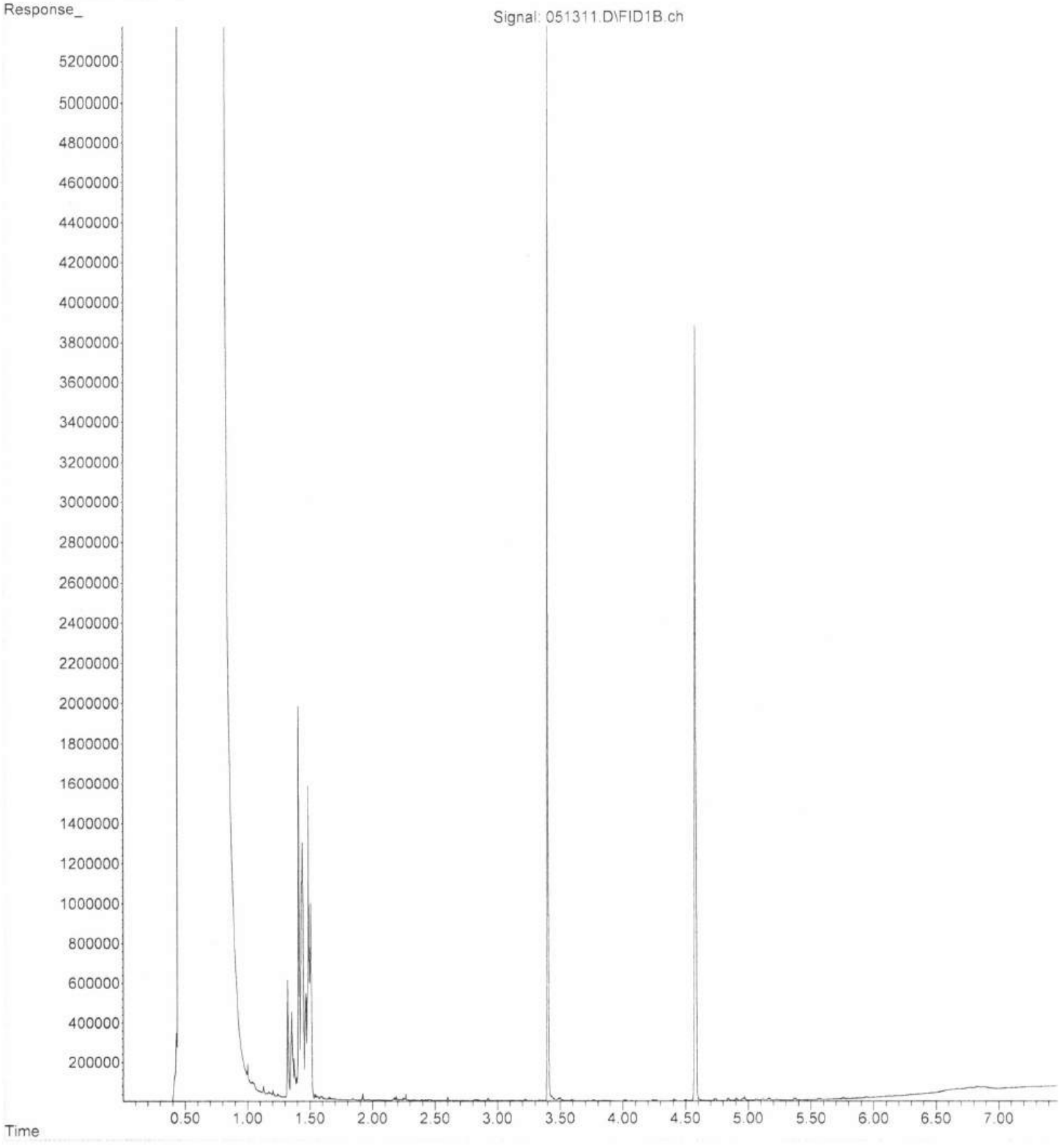
File :P:\Proc_GC14\05-14-24\051432.D
Operator : TL
Acquired : 14 May 2024 02:38 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-07 sg rr
Misc Info : ERR
Vial Number: 31



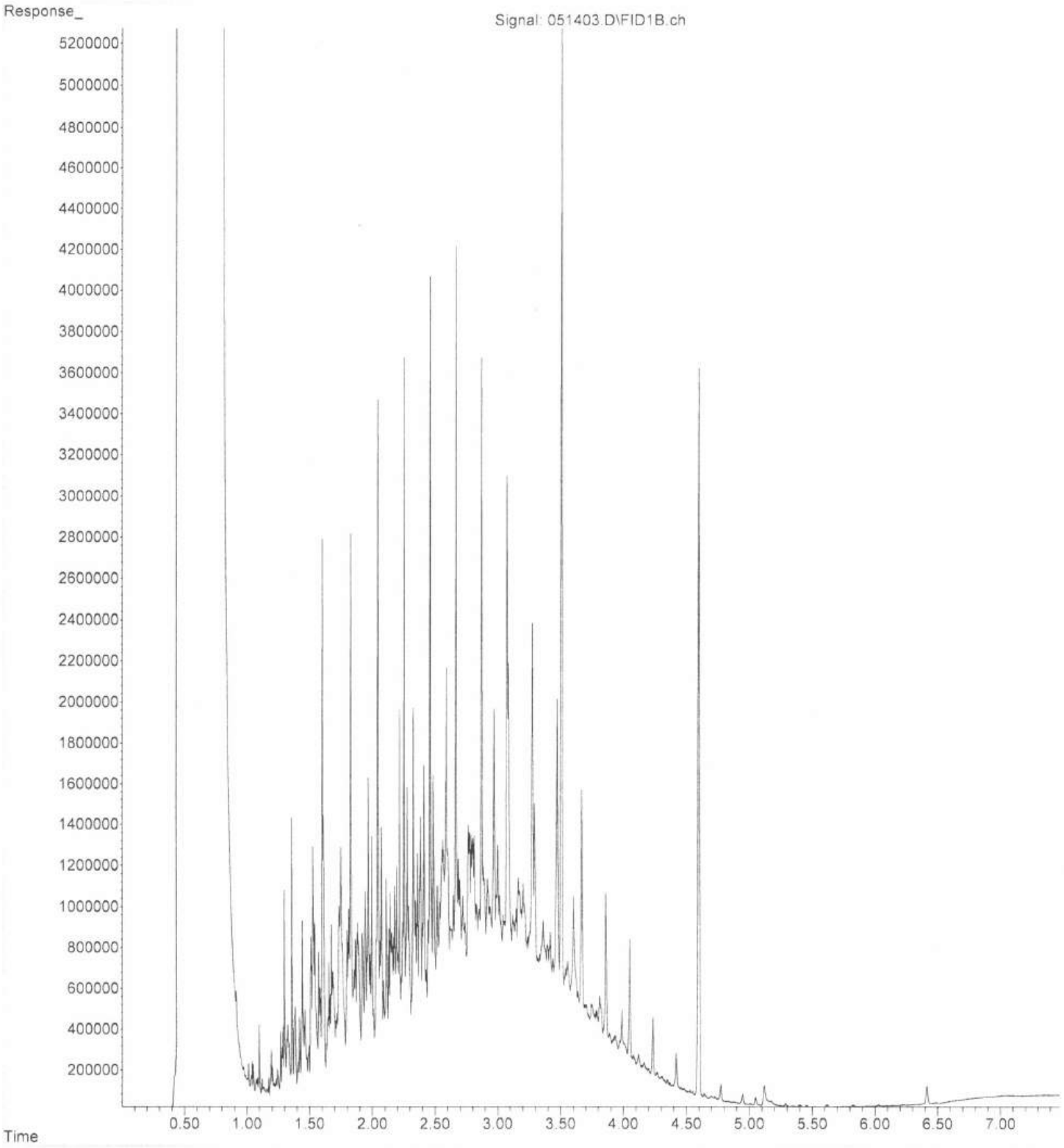
File : P:\Proc_GC14\05-14-24\051433.D
Operator : TL
Acquired : 14 May 2024 02:50 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405132-08 sg rr
Misc Info : ERR
Vial Number: 32



File :P:\Proc_GC14\05-13-24\051311.D
Operator : TL
Acquired : 13 May 2024 12:55 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 04-1126 mb sg
Misc Info : ERR
Vial Number: 13



File : P:\Proc_GC14\05-14-24\051403.D
Operator : TL
Acquired : 14 May 2024 08:38 am using AcqMethod DX.M
Instrument : GC14
Sample Name: 500 Dx 71-40G
Misc Info : ERR
Vial Number: 3



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

Friedman & Bruya
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

RE: 405132, E-187
Work Order Number: 2405153

May 16, 2024

Attention Michael Erdahl:

Fremont Analytical, Inc, an Alliance Technical Group company, received 6 sample(s) on 5/8/2024 for the analyses presented in the following report.

Dissolved Gases by RSK-175
Ion Chromatography by EPA 300.0
Total Organic Carbon by SM 5310C

All analyses were performed according to our accredited Quality Assurance program. Please contact the laboratory if you should have any questions about the results.

Please note, while the appearance of our logo and branding will update, our commitment to accuracy, speed, and customer service remain values celebrated and shared by Alliance Technical Group. Thank you for the opportunity to serve you.

Sincerely,

Brianna Barnes
Project Manager

DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.4 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Original

Date: *05/16/2024*

CLIENT: Friedman & Bruya
Project: 405132
Work Order: 2405153

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2405153-001	MW-1-050724	05/07/2024 12:15 PM	05/08/2024 10:28 AM
2405153-002	MW-101-050724	05/07/2024 12:30 PM	05/08/2024 10:28 AM
2405153-003	MW-3-050724	05/07/2024 1:45 PM	05/08/2024 10:28 AM
2405153-004	MW-1A-050724	05/07/2024 1:45 PM	05/08/2024 10:28 AM
2405153-005	MW-4B-050724	05/07/2024 2:45 PM	05/08/2024 10:28 AM
2405153-006	MW-2A-050724	05/07/2024 2:50 PM	05/08/2024 10:28 AM

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

Original

Case Narrative

WO#: **2405153**

Date: **5/16/2024**

CLIENT: Friedman & Bruya
Project: 405132

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

Analytical Report

Work Order: **2405153**
Date Reported: **5/16/2024**

CLIENT: Friedman & Bruya
Project: 405132

Lab ID: 2405153-001 **Collection Date:** 5/7/2024 12:15:00 PM
Client Sample ID: **MW-1-050724** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R91756		Analyst: CO
Methane	0.108	0.00500		mg/L	1	5/15/2024 1:32:00 PM
Ion Chromatography by EPA 300.0				Batch ID: 43820		Analyst: FG
Nitrate (as N)	ND	0.200		mg/L	1	5/8/2024 9:36:00 PM
Sulfate	19.5	1.00		mg/L	1	5/13/2024 8:57:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R91575		Analyst: FG
Total Organic Carbon	4.61	0.700		mg/L	1	5/9/2024 7:54:00 PM

Lab ID: 2405153-002 **Collection Date:** 5/7/2024 12:30:00 PM
Client Sample ID: **MW-101-050724** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R91756		Analyst: CO
Methane	0.107	0.00500		mg/L	1	5/15/2024 1:37:00 PM
Ion Chromatography by EPA 300.0				Batch ID: 43820		Analyst: FG
Nitrate (as N)	ND	0.200		mg/L	1	5/8/2024 10:02:00 PM
Sulfate	20.1	1.00		mg/L	1	5/13/2024 8:34:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R91575		Analyst: FG
Total Organic Carbon	4.61	0.700		mg/L	1	5/9/2024 8:16:00 PM

CLIENT: Friedman & Bruya
Project: 405132

Lab ID: 2405153-003 **Collection Date:** 5/7/2024 1:45:00 PM
Client Sample ID: **MW-3-050724** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R91756		Analyst: CO
Methane	0.00526	0.00500		mg/L	1	5/15/2024 1:41:00 PM
Ion Chromatography by EPA 300.0				Batch ID: 43864		Analyst: FG
Nitrate (as N)	2.73	0.200	H	mg/L	1	5/9/2024 4:00:00 PM
Sulfate	23.0	1.00		mg/L	1	5/15/2024 7:20:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R91575		Analyst: FG
Total Organic Carbon	2.55	0.700		mg/L	1	5/9/2024 8:37:00 PM

Lab ID: 2405153-004 **Collection Date:** 5/7/2024 1:45:00 PM
Client Sample ID: **MW-1A-050724** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R91756		Analyst: CO
Methane	0.00610	0.00500		mg/L	1	5/15/2024 1:44:00 PM
Ion Chromatography by EPA 300.0				Batch ID: 43905		Analyst: FG
Nitrate (as N)	6.50	1.00	DH	mg/L	5	5/13/2024 9:44:00 PM
Sulfate	20.4	5.00	D	mg/L	5	5/13/2024 9:44:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R91575		Analyst: FG
Total Organic Carbon	3.34	0.700		mg/L	1	5/9/2024 8:59:00 PM

CLIENT: Friedman & Bruya
Project: 405132

Lab ID: 2405153-005 **Collection Date:** 5/7/2024 2:45:00 PM
Client Sample ID: **MW-4B-050724** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R91756		Analyst: CO
Methane	1.49	0.0500	D	mg/L	10	5/15/2024 2:06:00 PM
Ion Chromatography by EPA 300.0				Batch ID: 43864		Analyst: FG
Nitrate (as N)	ND	0.200	H	mg/L	1	5/9/2024 4:53:00 PM
Sulfate	2.21	1.00		mg/L	1	5/15/2024 7:43:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R91575		Analyst: FG
Total Organic Carbon	8.85	0.700		mg/L	1	5/9/2024 9:33:00 PM

Lab ID: 2405153-006 **Collection Date:** 5/7/2024 2:50:00 PM
Client Sample ID: **MW-2A-050724** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R91756		Analyst: CO
Methane	0.489	0.0100	D	mg/L	2	5/15/2024 2:09:00 PM
Ion Chromatography by EPA 300.0				Batch ID: 43864		Analyst: FG
Nitrate (as N)	ND	0.200	H	mg/L	1	5/9/2024 5:20:00 PM
Sulfate	24.2	1.00		mg/L	1	5/14/2024 12:49:00 AM
Total Organic Carbon by SM 5310C				Batch ID: R91575		Analyst: FG
Total Organic Carbon	4.91	0.700		mg/L	1	5/9/2024 10:56:00 PM

Work Order: 2405153
CLIENT: Friedman & Bruya
Project: 405132

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **MB-43820**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **5/8/2024**		RunNo: **91595**		
Client ID: **MBLKW**	Batch ID: **43820**					Analysis Date: **5/8/2024**		SeqNo: **1910504**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.200									

Sample ID: **LCS-43820**	SampType: **LCS**			Units: **mg/L**		Prep Date: **5/8/2024**		RunNo: **91595**		
Client ID: **LCSW**	Batch ID: **43820**					Analysis Date: **5/8/2024**		SeqNo: **1910505**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.720	0.200	0.7500	0	96.0	90	110				

Sample ID: **2405118-001BDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **5/8/2024**		RunNo: **91595**		
Client ID: **BATCH**	Batch ID: **43820**					Analysis Date: **5/8/2024**		SeqNo: **1910507**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.200						0		20	

Sample ID: **2405118-001BMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **5/8/2024**		RunNo: **91595**		
Client ID: **BATCH**	Batch ID: **43820**					Analysis Date: **5/8/2024**		SeqNo: **1910508**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.736	0.200	0.7500	0	98.1	80	120				

Sample ID: **2405118-001BMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **5/8/2024**		RunNo: **91595**		
Client ID: **BATCH**	Batch ID: **43820**					Analysis Date: **5/8/2024**		SeqNo: **1910509**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.734	0.200	0.7500	0	97.9	80	120	0.7360	0.272	20	

Work Order: 2405153
CLIENT: Friedman & Bruya
Project: 405132

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **MB-43864**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **5/9/2024**		RunNo: **91597**		
Client ID: **MBLKW**	Batch ID: **43864**					Analysis Date: **5/9/2024**		SeqNo: **1910534**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.200									

Sample ID: **2405160-001ADUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **5/9/2024**		RunNo: **91597**		
Client ID: **BATCH**	Batch ID: **43864**					Analysis Date: **5/9/2024**		SeqNo: **1910541**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	22.4	0.200						22.36	0.143	20	E

Sample ID: **2405160-001AMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **5/9/2024**		RunNo: **91597**		
Client ID: **BATCH**	Batch ID: **43864**					Analysis Date: **5/9/2024**		SeqNo: **1910542**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	22.6	0.200	0.7500	22.36	38.0	80	120				ES

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **2405160-001AMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **5/9/2024**		RunNo: **91597**		
Client ID: **BATCH**	Batch ID: **43864**					Analysis Date: **5/9/2024**		SeqNo: **1910543**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	22.7	0.200	0.7500	22.36	40.4	80	120	22.65	0.0795	20	ES

NOTES:
S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: **LCS-43864**	SampType: **LCS**			Units: **mg/L**		Prep Date: **5/9/2024**		RunNo: **91597**		
Client ID: **LCSW**	Batch ID: **43864**					Analysis Date: **5/9/2024**		SeqNo: **1910544**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.712	0.200	0.7500	0	94.9	90	110				

Work Order: 2405153
CLIENT: Friedman & Bruya
Project: 405132

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **LCS-43905** SampType: **LCS** Units: **mg/L** Prep Date: **5/13/2024** RunNo: **91669**
Client ID: **LCSW** Batch ID: **43905** Analysis Date: **5/13/2024** SeqNo: **1912049**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.725	0.200	0.7500	0	96.7	90	110				
Sulfate	3.54	1.00	3.750	0	94.4	90	110				

Sample ID: **MB-43905** SampType: **MBLK** Units: **mg/L** Prep Date: **5/13/2024** RunNo: **91669**
Client ID: **MBLKW** Batch ID: **43905** Analysis Date: **5/13/2024** SeqNo: **1912051**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.200									
Sulfate	ND	1.00									

Sample ID: **2405118-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/13/2024** RunNo: **91669**
Client ID: **BATCH** Batch ID: **43905** Analysis Date: **5/13/2024** SeqNo: **1912057**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.200						0		20	
Sulfate	13.1	1.00						13.28	1.14	20	

Sample ID: **2405118-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/13/2024** RunNo: **91669**
Client ID: **BATCH** Batch ID: **43905** Analysis Date: **5/13/2024** SeqNo: **1912058**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.725	0.200	0.7500	0	96.7	80	120				
Sulfate	17.1	1.00	3.750	13.28	102	80	120				

Sample ID: **2405118-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **5/13/2024** RunNo: **91669**
Client ID: **BATCH** Batch ID: **43905** Analysis Date: **5/13/2024** SeqNo: **1912059**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.727	0.200	0.7500	0	96.9	80	120	0.7250	0.275	20	
Sulfate	16.9	1.00	3.750	13.28	95.2	80	120	17.10	1.46	20	

Work Order: 2405153
CLIENT: Friedman & Bruya
Project: 405132

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2405118-001BMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **5/13/2024**		RunNo: **91669**		
Client ID: **BATCH**	Batch ID: **43905**					Analysis Date: **5/13/2024**		SeqNo: **1912059**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **2405200-002CDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **5/13/2024**		RunNo: **91669**		
Client ID: **BATCH**	Batch ID: **43905**					Analysis Date: **5/14/2024**		SeqNo: **1912068**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.977	0.200						0.9910	1.42	20	
Sulfate	5.69	1.00						5.716	0.456	20	

Sample ID: **2405200-002CMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **5/13/2024**		RunNo: **91669**		
Client ID: **BATCH**	Batch ID: **43905**					Analysis Date: **5/14/2024**		SeqNo: **1912069**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	1.73	0.200	0.7500	0.9910	98.7	80	120				
Sulfate	9.26	1.00	3.750	5.716	94.5	80	120				

Sample ID: **LCS-43920**	SampType: **LCS**			Units: **mg/L**		Prep Date: **5/15/2024**		RunNo: **91753**		
Client ID: **LCSW**	Batch ID: **43920**					Analysis Date: **5/15/2024**		SeqNo: **1913864**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.55	1.00	3.750	0	94.7	90	110				

Sample ID: **MB-43920**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **5/15/2024**		RunNo: **91753**		
Client ID: **MBLKW**	Batch ID: **43920**					Analysis Date: **5/15/2024**		SeqNo: **1913866**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	ND	1.00									

Work Order: 2405153
CLIENT: Friedman & Bruya
Project: 405132

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2405239-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **5/15/2024** RunNo: **91753**
Client ID: **BATCH** Batch ID: **43920** Analysis Date: **5/16/2024** SeqNo: **1913894**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	22.3	1.00						22.20	0.274	20	

Sample ID: **2405239-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **5/15/2024** RunNo: **91753**
Client ID: **BATCH** Batch ID: **43920** Analysis Date: **5/16/2024** SeqNo: **1913895**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	25.6	1.00	3.750	22.20	89.4	80	120				

Sample ID: **2405239-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **5/15/2024** RunNo: **91753**
Client ID: **BATCH** Batch ID: **43920** Analysis Date: **5/16/2024** SeqNo: **1913896**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	25.6	1.00	3.750	22.20	91.1	80	120	25.55	0.246	20	

Work Order: 2405153
CLIENT: Friedman & Bruya
Project: 405132

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **MB-R91575**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/9/2024**	RunNo: **91575**
Client ID: **MBLKW**	Batch ID: **R91575**		Analysis Date: **5/9/2024**	SeqNo: **1910780**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.700									

Sample ID: **LCS-R91575**	SampType: **LCS**	Units: **mg/L**	Prep Date: **5/9/2024**	RunNo: **91575**
Client ID: **LCSW**	Batch ID: **R91575**		Analysis Date: **5/9/2024**	SeqNo: **1910781**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	5.10	0.700	5.000	0	102	90.6	119				

Sample ID: **2405072-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **5/9/2024**	RunNo: **91575**
Client ID: **BATCH**	Batch ID: **R91575**		Analysis Date: **5/9/2024**	SeqNo: **1910783**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	3.97	0.700						3.930	0.987	20	

Sample ID: **2405072-001AMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **5/9/2024**	RunNo: **91575**
Client ID: **BATCH**	Batch ID: **R91575**		Analysis Date: **5/9/2024**	SeqNo: **1910784**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	8.90	0.700	5.000	3.930	99.4	74.4	117				

Sample ID: **2405072-001AMSD**	SampType: **MSD**	Units: **mg/L**	Prep Date: **5/9/2024**	RunNo: **91575**
Client ID: **BATCH**	Batch ID: **R91575**		Analysis Date: **5/9/2024**	SeqNo: **1910785**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	9.05	0.700	5.000	3.930	102	74.4	117	8.901	1.65	30	

Work Order: 2405153
CLIENT: Friedman & Bruya
Project: 405132

QC SUMMARY REPORT

Dissolved Gases by RSK-175

Sample ID: **LCS-R91756**	SampType: **LCS**	Units: **ppmv**	Prep Date: **5/15/2024**	RunNo: **91756**
Client ID: **LCSW**	Batch ID: **R91756**		Analysis Date: **5/15/2024**	SeqNo: **1914022**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	991	0.00500	1,000	0	99.1	73.6	124				

Sample ID: **MB-R91756**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **5/15/2024**	RunNo: **91756**
Client ID: **MBLKW**	Batch ID: **R91756**		Analysis Date: **5/15/2024**	SeqNo: **1914021**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	ND	0.00500									

Sample ID: **2405153-001CREP**	SampType: **REP**	Units: **mg/L**	Prep Date: **5/15/2024**	RunNo: **91756**
Client ID: **MW-1-050724**	Batch ID: **R91756**		Analysis Date: **5/15/2024**	SeqNo: **1914008**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	0.109	0.00500						0.1085	0.796	30	

Sample Log-In Check List

Client Name:	FB	Work Order Number:	2405153
Logged by:	Clare Griggs	Date Received:	5/8/2024 10:28:00 AM

Chain of Custody

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

Log In

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

Special Handling (if applicable)

16. 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:			

17. Additional remarks:

Item Information

Item #	Temp ºC
Sample	4.4

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

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2405153

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 5500 4th Ave S

City, State, ZIP Seattle, WA 98108

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER Fremont	
PROJECT NAME/NO. 405132	PO # E-187
REMARKS Floyd Snider EDD	

TURNAROUND TIME
☒ Standard TAT
RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

						ANALYSES REQUESTED										
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	TOC	Nitrate	Sulfate	RSK Methane							Notes
MW-1-050724		5/7/2024	1215	water	5	x	x	x	x							
MW-101-050724		5/7/2024	1230	water	5	x	x	x	x							
MW-3-050724		5/7/2024	1345	water	5	x	x	x	x							
MW-1A-050724		5/7/2024	1345	water	5	x	x	x	x							
MW-4B-050724		5/7/2024	1445	water	5	x	x	x	x							
MW-2A-050724		5/7/2024	1450	water	5	x	x	x	x							

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

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	5/8/24	0933
Received by:		Briana Ballard	FAI	5/8	10:28AM
Relinquished by:					
Received by:					

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

September 20, 2024

Gabriel Cisneros, Project Manager
Floyd-Snider
Two Union Square
601 Union St, Suite 600
Seattle, WA 98101

Dear Mr Cisneros:

Included are the results from the testing of material submitted on September 10, 2024 from the Big B Ellensburg, F&BI 409113 project. There are 24 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Floyd Snider Lab Data, Manique Talaia-Murray
FDS0920R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 10, 2024 by Friedman & Bruya, Inc. from the Floyd-Snider Big B Ellensburg, F&BI 409113 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Floyd-Snider
409113 -01	MW-1A-091024
409113 -02	MW-3-091024
409113 -03	MW-2A-091024
409113 -04	MW-4B-091024
409113 -05	MW-9A-091024
409113 -06	MW-1-091024
409113 -07	MW-101-091024
409113 -08	MW-2-091024
409113 -09	TB-091024

The requested samples were sent to Alliance Technical Group for TOC, nitrate, sulfate, and RSK methane analyses. The report is enclosed.

All quality control requirements were acceptable.

Date of Report: 09/20/24
Date Received: 09/10/24
Project: Big B Ellensburg, F&BI 409113
Date Extracted: 09/16/24
Date Analyzed: 09/16/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
MW-2A-091024 409113-03	440	102
MW-4B-091024 409113-04	550	117
MW-9A-091024 409113-05	<100	103
MW-1-091024 409113-06	210	108
MW-101-091024 409113-07	280	109
MW-2-091024 409113-08	<100	103
Method Blank 04-1999 MB	<100	105

Date of Report: 09/20/24
Date Received: 09/10/24
Project: Big B Ellensburg, F&BI 409113
Date Extracted: 09/11/24
Date Analyzed: 09/16/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx
Sample Extracts Passed Through a Silica Gel Column Prior to Analysis
Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
MW-1A-091024 409113-01	<50	<250	76
MW-3-091024 409113-02	<50	<250	62
MW-2A-091024 409113-03	79 x	<250	77
MW-4B-091024 409113-04	390 x	<250	70
MW-9A-091024 409113-05	<50	<250	76
MW-1-091024 409113-06	540	530	80
MW-101-091024 409113-07	1,400	1,200	90
MW-2-091024 409113-08	780	<280	87
Method Blank 04-2185 MB	<50	<250	74

Date of Report: 09/20/24
Date Received: 09/10/24
Project: Big B Ellensburg, F&BI 409113
Date Extracted: 09/11/241329
Date Analyzed: 09/11/241329

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
MW-1A-091024 409113-01	<50	<250	84
MW-3-091024 409113-02	64 x	<250	75
MW-2A-091024 409113-03	490 x	<250	88
MW-4B-091024 409113-04	3,300 x	300 x	89
MW-9A-091024 409113-05	160 x	<250	86
MW-1-091024 409113-06	1,200 x	700	85
MW-101-091024 409113-07	2,200 x	1,500	98
MW-2-091024 409113-08	3,600 x	450 x	101
Method Blank 04-2185 MB	<50	<250	75

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW-2A-091024	Client:	Floyd-Snider
Date Received:	09/10/24	Project:	Big B Ellensburg
Date Extracted:	09/11/24	Lab ID:	409113-03
Date Analyzed:	09/11/24	Data File:	091122.D
Matrix:	Water	Instrument:	GCMS13
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	71	132
Toluene-d8	107	68	139
4-Bromofluorobenzene	104	62	136

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW-4B-091024	Client:	Floyd-Snider
Date Received:	09/10/24	Project:	Big B Ellensburg
Date Extracted:	09/11/24	Lab ID:	409113-04
Date Analyzed:	09/11/24	Data File:	091123.D
Matrix:	Water	Instrument:	GCMS13
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	92	71	132
Toluene-d8	99	68	139
4-Bromofluorobenzene	99	62	136

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW-9A-091024	Client:	Floyd-Snider
Date Received:	09/10/24	Project:	Big B Ellensburg
Date Extracted:	09/11/24	Lab ID:	409113-05
Date Analyzed:	09/11/24	Data File:	091124.D
Matrix:	Water	Instrument:	GCMS13
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	71	132
Toluene-d8	106	68	139
4-Bromofluorobenzene	108	62	136

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW-1-091024	Client:	Floyd-Snider
Date Received:	09/10/24	Project:	Big B Ellensburg
Date Extracted:	09/11/24	Lab ID:	409113-06
Date Analyzed:	09/11/24	Data File:	091125.D
Matrix:	Water	Instrument:	GCMS13
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	71	132
Toluene-d8	96	68	139
4-Bromofluorobenzene	103	62	136

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW-101-091024	Client:	Floyd-Snider
Date Received:	09/10/24	Project:	Big B Ellensburg
Date Extracted:	09/11/24	Lab ID:	409113-07
Date Analyzed:	09/11/24	Data File:	091126.D
Matrix:	Water	Instrument:	GCMS13
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	93	71	132
Toluene-d8	96	68	139
4-Bromofluorobenzene	99	62	136

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW-2-091024	Client:	Floyd-Snider
Date Received:	09/10/24	Project:	Big B Ellensburg
Date Extracted:	09/11/24	Lab ID:	409113-08
Date Analyzed:	09/11/24	Data File:	091127.D
Matrix:	Water	Instrument:	GCMS13
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	71	132
Toluene-d8	97	68	139
4-Bromofluorobenzene	101	62	136

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Big B Ellensburg
Date Extracted:	09/11/24	Lab ID:	04-2130 mb
Date Analyzed:	09/11/24	Data File:	091109.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	78	126
Toluene-d8	99	84	115
4-Bromofluorobenzene	100	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Naphthalene	<1

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW-1A-091024	Client:	Floyd-Snider
Date Received:	09/10/24	Project:	Big B Ellensburg
Date Extracted:	09/13/24	Lab ID:	409113-01
Date Analyzed:	09/13/24	Data File:	409113-01.132
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	2.0

Analysis For Dissolved Metals By EPA Method 6020

Client ID:	MW-3-091024	Client:	Floyd-Snider
Date Received:	09/10/24	Project:	Big B Ellensburg
Date Extracted:	09/13/24	Lab ID:	409113-02 x100
Date Analyzed:	09/18/24	Data File:	409113-02 x100.101
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	190

Analysis For Dissolved Metals By EPA Method 6020

Client ID:	MW-2A-091024	Client:	Floyd-Snider
Date Received:	09/10/24	Project:	Big B Ellensburg
Date Extracted:	09/13/24	Lab ID:	409113-03 x100
Date Analyzed:	09/18/24	Data File:	409113-03 x100.102
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	750

Analysis For Dissolved Metals By EPA Method 6020

Client ID:	MW-4B-091024	Client:	Floyd-Snider
Date Received:	09/10/24	Project:	Big B Ellensburg
Date Extracted:	09/13/24	Lab ID:	409113-04 x500
Date Analyzed:	09/18/24	Data File:	409113-04 x500.119
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	1,000

Analysis For Dissolved Metals By EPA Method 6020

Client ID:	MW-1-091024	Client:	Floyd-Snider
Date Received:	09/10/24	Project:	Big B Ellensburg
Date Extracted:	09/13/24	Lab ID:	409113-06 x100
Date Analyzed:	09/18/24	Data File:	409113-06 x100.104
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	750

Analysis For Dissolved Metals By EPA Method 6020

Client ID:	MW-101-091024	Client:	Floyd-Snider
Date Received:	09/10/24	Project:	Big B Ellensburg
Date Extracted:	09/13/24	Lab ID:	409113-07 x100
Date Analyzed:	09/18/24	Data File:	409113-07 x100.105
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	730

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	NA	Project:	Big B Ellensburg
Date Extracted:	09/13/24	Lab ID:	I4-755 mb
Date Analyzed:	09/13/24	Data File:	I4-755 mb.121
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	<1

Date of Report: 09/20/24
Date Received: 09/10/24
Project: Big B Ellensburg, F&BI 409113

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 409137-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	110	70-130

Date of Report: 09/20/24
Date Received: 09/10/24
Project: Big B Ellensburg, F&BI 409113

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

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	72	80	65-151	11

Date of Report: 09/20/24
Date Received: 09/10/24
Project: Big B Ellensburg, F&BI 409113

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	80	84	65-151	5

Date of Report: 09/20/24
Date Received: 09/10/24
Project: Big B Ellensburg, F&BI 409113

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 409071-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Benzene	ug/L (ppb)	10	<0.35	97	50-150
Toluene	ug/L (ppb)	10	<1	98	50-150
Ethylbenzene	ug/L (ppb)	10	<1	100	50-150
m,p-Xylene	ug/L (ppb)	20	<2	99	50-150
o-Xylene	ug/L (ppb)	10	<1	98	50-150
Naphthalene	ug/L (ppb)	10	<1	89	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benzene	ug/L (ppb)	10	93	93	70-130	0
Toluene	ug/L (ppb)	10	91	95	70-130	4
Ethylbenzene	ug/L (ppb)	10	94	96	70-130	2
m,p-Xylene	ug/L (ppb)	20	93	95	70-130	2
o-Xylene	ug/L (ppb)	10	94	93	70-130	1
Naphthalene	ug/L (ppb)	10	98	91	70-130	7

Date of Report: 09/20/24
Date Received: 09/10/24
Project: Big B Ellensburg, F&BI 409113

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 409137-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Manganese	ug/L (ppb)	20	<1	97	98	75-125	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Manganese	ug/L (ppb)	20	97	80-120

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

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

409113 Isabel Cisneros

SAMPLE CHAIN OF CUSTODY 09/10/24 I2/L2/VW5

Page # 1 of 1

Report To Monique Tabia Murray
Company Floyd Snider
Address 601 Union St Ste 600
City, State, ZIP Seattle WA 98101
Phone 206 292 2078 Email

SAMPLERS (signature)
PROJECT NAME: Big B Ellensburg
PO #
REMARKS
Project specific RLs? - Yes / No
INVOICE TO

TURNAROUND TIME
☑ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: NWTPH-Dx (1)	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260 (2)	PAHs EPA 8270	PCBs EPA 8082	TOC	Nitrate/Sulfate (3)	Manganese Dis	Methane	Notes
MW-1A-091024	01 A-G	9/10/24	10:35	GW	7	X							X	X	X	X	(1) Dx with + w/o SG
MW-3-091024	02 ↓	9/10/24	10:40	GW	7	X							X	X	X	X	(2) field filtered
MW-2A-091024	03 A-M	9/10/24	11:35	GW	13	X	X			X			X	X	X	X	(3) only BTEX and Naphthalene
MW-4B-091024	04 ↓	9/10/24	11:40	GW	13	X	X			X			X	X	X	X	
MW-9A-091024	05 A-G	9/10/24	13:10	GW	7	X	X			X							
MW-1-091024	06 A-M	9/10/24	13:10	GW	13	X	X			X			X	X	X	X	
MW-101-091024	07 ↓	9/10/24	13:20	GW	13	X	X			X			X	X	X	X	
MW-2-091024	08 A-G	9/10/24	1415	GW	7	X	X			X							
TB-091024	09 A-B	9/10/24		W	2												

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Henry Bates	FS	9/10/24	1645
Received by:	VINH	FBI	9-10-24	1645
Relinquished by:		Samples received at 4 °C		
Received by:				

Friedman & Bruya, Inc.
Ph. (206) 285-8282

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 409113 CLIENT FDS INITIALS/ DATE: GMB 9/10

If custody seals are present on cooler, are they intact? ☒ NA ☐ YES ☐ NO

Cooler/Sample temperature 4 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☒ YES ☐ NO

How did samples arrive?
☒ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☒ YES ☐ NO Initials/ Date: AP 11 09/10/24
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory ☒ days

Are the samples clearly identified? (explain "no" answer below) ☒ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☒ YES ☐ NO

Were appropriate sample containers used? ☒ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☒ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☐ NA ☒ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☒ Yes ☐ No	☐ Not on COC/label
Date Sampled	☒ Yes ☐ No	☐ Not on COC/label
Time Sampled	☒ Yes ☐ No	☐ Not on COC/label
# of Containers	☒ Yes ☐ No	
Relinquished	☒ Yes ☐ No	
Requested analysis	☒ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☒ NA ☐ YES ☐ NO

Number of unused TO15 canisters _____ Number of unused TO17 tubes _____

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

Friedman & Bruya
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

RE: 409113,
Work Order Number: 2409134

September 16, 2024

Attention Michael Erdahl:

Fremont Analytical, Inc, an Alliance Technical Group company, received 6 sample(s) on 9/11/2024 for the analyses presented in the following report.

Dissolved Gases by RSK-175
Ion Chromatography by EPA 300.0
Total Organic Carbon by SM 5310C

All analyses were performed according to our accredited Quality Assurance program. Please contact the laboratory if you should have any questions about the results.

Please note, while the appearance of our logo and branding will update, our commitment to accuracy, speed, and customer service remain values celebrated and shared by Alliance Technical Group. Thank you for the opportunity to serve you.

Sincerely,

Brianna Barnes
Project Manager

DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.4 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Original

Date: *09/16/2024*

CLIENT: Friedman & Bruya
Project: 409113
Work Order: 2409134

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2409134-001	MW-1A-091024	09/10/2024 10:35 AM	09/11/2024 1:55 PM
2409134-002	MW-3-091024	09/10/2024 10:40 AM	09/11/2024 1:55 PM
2409134-003	MW-2A-091024	09/10/2024 11:35 AM	09/11/2024 1:55 PM
2409134-004	MW-4B-091024	09/10/2024 11:40 AM	09/11/2024 1:55 PM
2409134-005	MW-1-091024	09/10/2024 1:10 PM	09/11/2024 1:55 PM
2409134-006	MW-101-091024	09/10/2024 1:20 PM	09/11/2024 1:55 PM

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

Original

Case Narrative

WO#: **2409134**

Date: **9/16/2024**

CLIENT: Friedman & Bruya
Project: 409113

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

Analytical Report

Work Order: **2409134**
Date Reported: **9/16/2024**

CLIENT: Friedman & Bruya
Project: 409113

Lab ID: 2409134-001 **Collection Date:** 9/10/2024 10:35:00 AM
Client Sample ID: **MW-1A-091024** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R94303		Analyst: CO
Methane	ND	0.00500		mg/L	1	9/12/2024 3:53:00 PM
Ion Chromatography by EPA 300.0				Batch ID: 45142		Analyst: OP
Nitrate (as N)	3.76	0.400	D	mg/L	2	9/11/2024 4:35:00 PM
Sulfate	16.4	2.00	D	mg/L	2	9/11/2024 4:35:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R94337		Analyst: OP
Total Organic Carbon	1.96	0.700		mg/L-dry	1	9/12/2024 10:23:00 PM

Lab ID: 2409134-002 **Collection Date:** 9/10/2024 10:40:00 AM
Client Sample ID: **MW-3-091024** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R94303		Analyst: CO
Methane	0.00889	0.00500		mg/L	1	9/12/2024 3:57:00 PM
Ion Chromatography by EPA 300.0				Batch ID: 45142		Analyst: OP
Nitrate (as N)	1.42	0.400	D	mg/L	2	9/11/2024 5:44:00 PM
Sulfate	13.4	2.00	D	mg/L	2	9/11/2024 5:44:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R94337		Analyst: OP
Total Organic Carbon	1.88	0.700		mg/L	1	9/12/2024 10:45:00 PM

CLIENT: Friedman & Bruya
Project: 409113

Lab ID: 2409134-003 **Collection Date:** 9/10/2024 11:35:00 AM
Client Sample ID: **MW-2A-091024** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R94303		Analyst: CO
Methane	0.614	0.0250	D	mg/L	5	9/12/2024 4:07:00 PM
Ion Chromatography by EPA 300.0				Batch ID: 45142		Analyst: OP
Nitrate (as N)	ND	0.400	D	mg/L	2	9/11/2024 6:08:00 PM
Sulfate	16.7	2.00	D	mg/L	2	9/11/2024 6:08:00 PM
NOTES: Diluted due to high levels of non-target analytes.						
Total Organic Carbon by SM 5310C				Batch ID: R94337		Analyst: OP
Total Organic Carbon	3.89	0.700		mg/L	1	9/12/2024 11:07:00 PM

Lab ID: 2409134-004 **Collection Date:** 9/10/2024 11:40:00 AM
Client Sample ID: **MW-4B-091024** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R94303		Analyst: CO
Methane	1.31	0.0500	D	mg/L	10	9/12/2024 4:09:00 PM
Ion Chromatography by EPA 300.0				Batch ID: 45142		Analyst: OP
Nitrate (as N)	ND	0.400	D	mg/L	2	9/11/2024 6:31:00 PM
Sulfate	ND	2.00	D	mg/L	2	9/11/2024 6:31:00 PM
NOTES: Diluted due to high levels of non-target analytes.						
Total Organic Carbon by SM 5310C				Batch ID: R94337		Analyst: OP
Total Organic Carbon	11.3	0.700		mg/L	1	9/12/2024 11:41:00 PM

CLIENT: Friedman & Bruya
Project: 409113

Lab ID: 2409134-005 **Collection Date:** 9/10/2024 1:10:00 PM
Client Sample ID: **MW-1-091024** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R94303		Analyst: CO
Methane	0.210	0.00500		mg/L	1	9/12/2024 4:02:00 PM
Ion Chromatography by EPA 300.0				Batch ID: 45142		Analyst: OP
Nitrate (as N)	ND	0.400	D	mg/L	2	9/11/2024 6:54:00 PM
Sulfate	11.5	2.00	D	mg/L	2	9/11/2024 6:54:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R94337		Analyst: OP
Total Organic Carbon	4.58	0.700		mg/L	1	9/13/2024 12:12:00 AM

NOTES:
Diluted due to high levels of non-target analytes.

Lab ID: 2409134-006 **Collection Date:** 9/10/2024 1:20:00 PM
Client Sample ID: **MW-101-091024** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Gases by RSK-175				Batch ID: R94303		Analyst: CO
Methane	0.148	0.00500		mg/L	1	9/12/2024 4:05:00 PM
Ion Chromatography by EPA 300.0				Batch ID: 45142		Analyst: OP
Nitrate (as N)	ND	0.400	D	mg/L	2	9/11/2024 7:17:00 PM
Sulfate	11.9	2.00	D	mg/L	2	9/11/2024 7:17:00 PM
Total Organic Carbon by SM 5310C				Batch ID: R94337		Analyst: OP
Total Organic Carbon	4.50	0.700		mg/L	1	9/13/2024 1:27:00 AM

NOTES:
Diluted due to high levels of non-target analytes.

Work Order: 2409134
CLIENT: Friedman & Bruya
Project: 409113

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **MB-45142**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **9/10/2024**	RunNo: **94230**
Client ID: **MBLKW**	Batch ID: **45142**		Analysis Date: **9/10/2024**	SeqNo: **1968788**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.200									
Sulfate	ND	1.00									

Sample ID: **LCS-45142**	SampType: **LCS**	Units: **mg/L**	Prep Date: **9/10/2024**	RunNo: **94230**
Client ID: **LCSW**	Batch ID: **45142**		Analysis Date: **9/10/2024**	SeqNo: **1968791**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.753	0.200	0.7500	0	100	90	110				
Sulfate	3.79	1.00	3.750	0	101	90	110				

Sample ID: **2409039-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **9/10/2024**	RunNo: **94230**
Client ID: **BATCH**	Batch ID: **45142**		Analysis Date: **9/10/2024**	SeqNo: **1968793**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	ND	0.200						0		20	H
Sulfate	ND	1.00						0		20	

Sample ID: **2409039-001AMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **9/10/2024**	RunNo: **94230**
Client ID: **BATCH**	Batch ID: **45142**		Analysis Date: **9/10/2024**	SeqNo: **1968794**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.755	0.200	0.7500	0	101	80	120				H
Sulfate	4.44	1.00	3.750	0.6350	102	80	120				

Sample ID: **2409039-001AMSD**	SampType: **MSD**	Units: **mg/L**	Prep Date: **9/10/2024**	RunNo: **94230**
Client ID: **BATCH**	Batch ID: **45142**		Analysis Date: **9/10/2024**	SeqNo: **1968795**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.806	0.200	0.7500	0	107	80	120	0.7550	6.53	20	H
Sulfate	4.77	1.00	3.750	0.6350	110	80	120	4.445	7.10	20	

Work Order: 2409134
CLIENT: Friedman & Bruya
Project: 409113

QC SUMMARY REPORT

Ion Chromatography by EPA 300.0

Sample ID: **2409039-001AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **9/10/2024** RunNo: **94230**
Client ID: **BATCH** Batch ID: **45142** Analysis Date: **9/10/2024** SeqNo: **1968795**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **2409134-001ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **9/11/2024** RunNo: **94230**
Client ID: **MW-1A-091024** Batch ID: **45142** Analysis Date: **9/11/2024** SeqNo: **1968812**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	3.78	0.400						3.764	0.477	20	D
Sulfate	16.5	2.00						16.40	0.777	20	D

Sample ID: **2409134-001AMS** SampType: **MS** Units: **mg/L** Prep Date: **9/11/2024** RunNo: **94230**
Client ID: **MW-1A-091024** Batch ID: **45142** Analysis Date: **9/11/2024** SeqNo: **1968813**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	5.40	0.400	1.500	3.764	109	80	120				D
Sulfate	24.8	2.00	7.500	16.40	111	80	120				D

Work Order: 2409134
CLIENT: Friedman & Bruya
Project: 409113

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **MB-94337**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **9/12/2024**		RunNo: **94337**		
Client ID: **MBLKW**	Batch ID: **R94337**					Analysis Date: **9/12/2024**		SeqNo: **1970049**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.700									

Sample ID: **LCS-94337**	SampType: **LCS**			Units: **mg/L**		Prep Date: **9/12/2024**		RunNo: **94337**		
Client ID: **LCSW**	Batch ID: **R94337**					Analysis Date: **9/12/2024**		SeqNo: **1970025**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	25.1	0.700	25.00	0	100	87.6	109				

Sample ID: **2409095-001CDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **9/12/2024**		RunNo: **94337**		
Client ID: **BATCH**	Batch ID: **R94337**					Analysis Date: **9/12/2024**		SeqNo: **1970027**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	12.3	0.700						12.34	0.154	20	

Sample ID: **2409095-001CMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **9/12/2024**		RunNo: **94337**		
Client ID: **BATCH**	Batch ID: **R94337**					Analysis Date: **9/12/2024**		SeqNo: **1970028**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	37.3	0.700	25.00	12.34	99.8	73.1	113.1				

Sample ID: **2409095-001CMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **9/12/2024**		RunNo: **94337**		
Client ID: **BATCH**	Batch ID: **R94337**					Analysis Date: **9/12/2024**		SeqNo: **1970029**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	37.6	0.700	25.00	12.34	101	73.1	113.1	37.29	0.897	30	

Work Order: 2409134
CLIENT: Friedman & Bruya
Project: 409113

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **2409134-005BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **9/13/2024** RunNo: **94337**
Client ID: **MW-1-091024** Batch ID: **R94337** Analysis Date: **9/13/2024** SeqNo: **1970043**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	4.45	0.700						4.576	2.86	20	

Sample ID: **2409134-005BMS** SampType: **MS** Units: **mg/L** Prep Date: **9/13/2024** RunNo: **94337**
Client ID: **MW-1-091024** Batch ID: **R94337** Analysis Date: **9/13/2024** SeqNo: **1970044**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	29.9	0.700	25.00	4.576	101	73.1	113.1				

Work Order: 2409134
CLIENT: Friedman & Bruya
Project: 409113

QC SUMMARY REPORT

Dissolved Gases by RSK-175

Sample ID: **LCS-R94303**	SampType: **LCS**	Units: **ppmv**	Prep Date: **9/12/2024**	RunNo: **94303**
Client ID: **LCSW**	Batch ID: **R94303**		Analysis Date: **9/12/2024**	SeqNo: **1969572**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	901	0.00500	1,000	0	90.1	73.6	124				

Sample ID: **MB-R94303**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **9/12/2024**	RunNo: **94303**
Client ID: **MBLKW**	Batch ID: **R94303**		Analysis Date: **9/12/2024**	SeqNo: **1969530**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	ND	0.00500									

Sample ID: **2409127-001AREP**	SampType: **REP**	Units: **mg/L**	Prep Date: **9/12/2024**	RunNo: **94303**
Client ID: **BATCH**	Batch ID: **R94303**		Analysis Date: **9/12/2024**	SeqNo: **1969506**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	0.0159	0.00500						0.01504	5.45	30	

Sample ID: **2409134-001CREP**	SampType: **REP**	Units: **mg/L**	Prep Date: **9/12/2024**	RunNo: **94303**
Client ID: **MW-1A-091024**	Batch ID: **R94303**		Analysis Date: **9/12/2024**	SeqNo: **1969517**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	ND	0.00500						0		30	

Sample Log-In Check List

Client Name:	FB	Work Order Number:	2409134
Logged by:	Clare Griggs	Date Received:	9/11/2024 1:55:00 PM

Chain of Custody

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

Log In

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

Special Handling (if applicable)

16. 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:			

17. Additional remarks:

Item Information

Item #	Temp ºC
Sample	4.1

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

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2409134

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 5500 4th Ave S

City, State, ZIP Seattle, WA 98108

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
Alliance Technical Group

PROJECT NAME/NO.	PO #
409113	E-397

REMARKS

Floyd Snider EDD

TURNAROUND TIME
☒ Standard TAT
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

						ANALYSES REQUESTED										
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	TOC	Nitrate	Sulfate	RSK Methane							Notes
MW-1A-091024		9/10/2024	1035	water	1	x	x	x	x							
MW-3-091024		9/10/2024	1040	water	1	x	x	x	x							
MW-2A-091024		9/10/2024	1135	water	1	x	x	x	x							
MW-4B-091024		9/10/2024	1140	water	1	x	x	x	x							
MW-1-091024		9/10/2024	1310	water	1	x	x	x	x							
MW-101-091024		9/10/2024	1320	water	1	x	x	x	x							

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

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	9/11/24	0733
Received by:		Nathan Walker	ATG	9/11/24	1355
Relinquished by:					
Received by:					

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: Big B
Task: GW Monit
Date of Collection: ~~5/8/24~~ HB 5/7/24
Field Personnel: DG HB

Purge Data

Well ID: MW-9A Secure: ☑ Yes ☐ No Ecology Tag #: _____ Casing Type/Diameter/Screened Interval PVC 2"

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) ____ Stripped (#) ____ Other Damage: –

Depth Sounder decontaminated Prior to Placement in Well: ☑ Yes ☐ No One Casing Volume (gal): _____

Depth of water (from TOC): 4.89 Time: 10:26

Total Depth (from log or field measurement): 8.42

After 5 minutes of purging (from top of casing): ↓

Begin purge (time): 10:36 End purge (time): 11:04

Volume purged: 5L Purge water disposal method Drum

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
10:38	4.92	0.5	6.34	1.25	269.0	8.66	13.5	185.1	
10:42	4.94	1.0	6.45	0.64	269.3	7.44	13.3	175.1	
10:46	4.95	2.0	6.52	0.46	266.5	5.10	13.2	151.9	
10:50	4.95	2.5	6.56	0.39	265.1	3.28	13.2	123.4	
10:52	4.95	3.0	6.59	0.36	264.4	–	13.2	105.7	
10:56	4.95	3.5	6.61	0.34	264.2	2.53	13.2	89.2	

Sampling Data

Sample No: MW-9A-050724 Location and Depth: MW-9A @ ~9'

Date Collected (mo/dy/yr): 05/07/24 Time Collected: 11:00 Weather: Clear & windy

Type: ☑ Ground Water ☐ Surface Water Other: _____ Sample: ☐ Filtered ☑ Unfiltered Filter Type: _____

Sample Collected with: ☐ Bailer ☑ Pump Other: _____ Type: ☑ Peristaltic ☐ Bladder ☐ Submersible Other: _____

Water Quality Instrument Data Collected with: Type: ☑ YSI ProDSS ☑ Turbidity Meter ☐ Other: _____

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☐ disposable tubing ☑ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): clear w/ some particulates

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes
					Fe - 3.0 mg/L

QC samples

Duplicate Sample No: – Duplicate Time: – MS/MSD: ☐ Yes ☒ No

Signature: [signature] Date: 5/7/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: BOB Date of Collection: 5/7/24

Task: GW Monit Field Personnel: HB

Purge Data

Well ID: MW-2 Toads Secure: ☑ Yes ☐ No Ecology Tag #: – Casing Type/Diameter/Screened Interval PVC 2"

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) ____ Stripped (#) ____ Other Damage: –

Depth Sounder decontaminated Prior to Placement in Well: ☑ Yes ☐ No One Casing Volume (gal): ____

Depth of water (from TOC): 4.54 Time: 11:30

Total Depth (from log or field measurement): 14.20

After 5 minutes of purging (from top of casing): 4.59

Begin purge (time): 11:40 End purge (time): 12:20

Volume purged: 7 L Purge water disposal method drum

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
11:45	4.55	2	6.44	0.86	377.8	6.09	12.6	-30.0	
11:50	4.56	3	6.48	0.66	374.7	3.99	12.3	-41.4	
11:55	4.56	4	6.51	0.55	372.2	5.14	12.2	-52.3	
12:00	4.57	5	6.57	0.49	370.6	2.64	12.3	-60.9	
12:05	4.56	6	6.61	0.45	369.5	1.73	12.2	-67.8	

Sampling Data

Sample No: MW-2-050724 Location and Depth: MW-2 Toads

Date Collected (mo/dy/yr): 5/7/24 Time Collected: 12:05 Weather: 45° windy

Type: ☒ Ground Water ☐ Surface Water Other: ____ Sample: ☐ Filtered ☒ Unfiltered Filter Type: –

Sample Collected with: ☐ Bailer ☒ Pump Other: ____ Type: ☒ Peristaltic ☐ Bladder ☐ Submersible Other: ____

Water Quality Instrument Data Collected with: Type: ☒ YSI ProDSS ☒ Turbidity Meter ☐ Other: ____

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☒ disposable tubing ☐ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): Ferrous Iron: 2.3

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes

QC samples

Duplicate Sample No: – Duplicate Time: – MS/MSD: ☐ Yes ☒ No

Signature: [signature] **Date:** 5/7/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: BIG B

Date of Collection: 5/7/24

Task: GW Monitoring

Field Personnel: DG

Purge Data

Well ID: MW-1 Secure: ☒ Yes ☐ No Ecology Tag #: _____ Casing Type/Diameter/Screened Interval _____

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) ____ Stripped (#) ____ Other Damage: _____

Depth Sounder decontaminated Prior to Placement in Well: ☒ Yes ☐ No One Casing Volume (gal): _____

Depth of water (from TOC): 4.62 Time: 11:36

Total Depth (from log or field measurement): 13.40

After 5 minutes of purging (from top of casing): 4.64

Begin purge (time): 11:48 End purge (time): 12:42

Volume purged: 11L Purge water disposal method Drum

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
11:50	4.64	0.25	6.84	2.22	279.0	6.56	12.3	124.3	
11:54	4.65	1.5	6.77	0.69	275.7	6.75	12.2	99.2	
11:58	4.64	2.5	6.77	0.46	273.0	4.52	12.2	76.4	
12:02	4.64	3.5	6.77	0.38	269.4	3.10	12.2	54.9	
12:06	4.64	4.5	6.76	0.33	267.7	-	12.2	37.2	
12:10	4.64	5.5	6.77	0.30	266.5	3.16	12.2	26.7	

Sampling Data

Sample No: MW-1-050724 Location and Depth: MW-1 @ ~8'

Date Collected (mo/dy/yr): 05/07/24 Time Collected: 12:15 Weather: Clear + windy

Type: ☒ Ground Water ☐ Surface Water Other: _____ Sample: ☐ Filtered ☐ Unfiltered Filter Type: _____

Sample Collected with: ☐ Bailer ☒ Pump Other: _____ Type: ☒ Peristaltic ☐ Bladder ☐ Submersible Other: _____

Water Quality Instrument Data Collected with: Type: ☒ YSI ProDSS ☒ Turbidity Meter ☐ Other: _____

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☐ disposable tubing ☒ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): Clear

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes
					Fe - 4.5 mg/L

QC samples

Duplicate Sample No: MW-101-050724 Duplicate Time: 12:30 MS/MSD: ☐ Yes ☒ No

Signature: _____ **Date:** 5/7/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: BigB Date of Collection: 5/7/24

Task: 6N Manif Field Personnel: HB

Purge Data

Well ID: MW-3 Secure: ☑ Yes ☐ No Ecology Tag #: - Casing Type/Diameter/Screened Interval PVC 2"

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#)____ Stripped (#)____ Other Damage: -

Depth Sounder decontaminated Prior to Placement in Well: ☑ Yes ☐ No One Casing Volume (gal): ____

Depth of water (from TOC): 5.06 Time: 13:14

Total Depth (from log or field measurement): 10.95

After 5 minutes of purging (from top of casing): 5.07

Begin purge (time): 1320 End purge (time): 1355

Volume purged: 9L Purge water disposal method drum

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
1325	5.07	1	6.70	2.79	326.3	0.82	12.2	46.9	
1330	5.07	2	6.64	0.96	326.2	0.87	12.1	46.5	
1335	5.07	3	6.64	0.58	325.4	0.66	12.1	45.9	
1340	5.07	4	6.64	0.49	325.2	0.56	12.1	45.4	
1345	5.06	5	6.64	0.45	325.1	0.66	12.1	46.1	

Sampling Data

Sample No: MW-3-050724 Location and Depth: MW-3

Date Collected (mo/dy/yr): 5/7/24 Time Collected: 13:45 Weather: 50° windy

Type: ☑ Ground Water ☐ Surface Water Other: - Sample: ☑ Filtered ☐ Unfiltered Filter Type: 0.45 dissolved

Sample Collected with: ☐ Bailer ☑ Pump Other: - Type: ☑ Peristaltic ☐ Bladder ☐ Submersible Other: -

Water Quality Instrument Data Collected with: Type: ☑ YSI ProDSS ☑ Turbidity Meter ☐ Other: -

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☐ disposable tubing ☐ dedicated silicon and poly tubing; ☑ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): clear, no odor Ferrous Iron: 0.0

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes
/	/	/	/	/	/

QC samples

Duplicate Sample No: - Duplicate Time: - MS/MSD: ☐ Yes ☑ No

Signature: [signature] **Date:** 5/7/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: Big B — Date of Collection: 5/7/24

Task: GW Monitoring — Field Personnel: DG

Purge Data

Well ID: MW-1A — Secure: ☒ Yes ☐ No — Ecology Tag #: _____ — Casing Type/Diameter/Screened Interval _____

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) ____ Stripped (#) ____ — Other Damage: _____

Depth Sounder decontaminated Prior to Placement in Well: ☒ Yes ☐ No — One Casing Volume (gal): _____

Depth of water (from TOC): 4.90 — Time: 13:15

Total Depth (from log or field measurement): 13.85

After 5 minutes of purging (from top of casing): 4.90

Begin purge (time): 13:17 — End purge (time): 13:58

Volume purged: 9L — Purge water disposal method: Drum

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
13:20	4.90	0.25	6.87	1.70	265.4	20.8	13.6	108.6	
13:24	4.90	1.5	6.64	0.83	257.3	13.6	13.6	111.0	
13:28	4.90	2.5	6.62	0.76	266.0	4.22	13.4	111.8	
13:32	4.90	4.0	6.60	0.51	269.2	–	13.5	110.1	
13:36	4.90	4.75	6.59	0.48	269.4	–	13.5	109.4	
13:40	4.90	6.0	6.59	0.45	269.6	1.90	13.5	107.6	

Sampling Data

Sample No: MW-1A-050724 — Location and Depth: MW-1A @ ~8'

Date Collected (mo/dy/yr): 05/07/24 — Time Collected: 13:45 — Weather: Clear + windy

Type: ☒ Ground Water ☐ Surface Water Other: _____ — Sample: ☐ Filtered ☐ Unfiltered Filter Type: _____

Sample Collected with: ☐ Bailer ☒ Pump Other: _____ — Type: ☒ Peristaltic ☐ Bladder ☐ Submersible Other: _____

Water Quality Instrument Data Collected with: Type: ☒ YSI ProDSS ☒ Turbidity Meter ☐ Other: _____

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☐ disposable tubing ☒ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): Clear

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes
					Fe - 0 mg/L

QC samples

Duplicate Sample No: – — Duplicate Time: – — MS/MSD: ☐ Yes ☒ No

Signature: Daniella Gallo — **Date:** 5/7/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: Bldg B Date of Collection: 5/7/24

Task: GW Monitoring Field Personnel: DG

Purge Data

Well ID: MW-4B Secure: ☒ Yes ☐ No Ecology Tag #: _____ Casing Type/Diameter/Screened Interval _____

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) ____ Stripped (#) ____ Other Damage: _____

Depth Sounder decontaminated Prior to Placement in Well: ☒ Yes ☐ No One Casing Volume (gal): _____

Depth of water (from TOC): 4.22 Time: 14:15

Total Depth (from log or field measurement): _____

After 5 minutes of purging (from top of casing): 4.24

Begin purge (time): 14:19 End purge (time): _____

Volume purged: _____ Purge water disposal method Drum

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
14:23	4.24	0.25	6.75	1.10	273.8	1.51	12.7	119.6	
14:27	4.25	1.5	6.75	0.43	272.2	1.34	12.5	56.1	
14:31	4.23	2.5	6.77	0.34	268.5	1.23	12.5	18.1	
14:35	4.25	3.5	6.79	0.31	263.9	—	12.5	-4.7	
14:39	4.25	4.5	6.79	0.29	261.1	1.45	12.4	-18.2	
								-21.3	

Sampling Data

Sample No: MW-4B-050724 Location and Depth: MW-4B

Date Collected (mo/dy/yr): 05/07/24 Time Collected: 14:45 Weather: Clear & windy

Type: ☒ Ground Water ☐ Surface Water Other: _____ Sample: ☐ Filtered ☐ Unfiltered Filter Type: _____

Sample Collected with: ☐ Bailer ☒ Pump Other: _____ Type: ☒ Peristaltic ☐ Bladder ☐ Submersible Other: _____

Water Quality Instrument Data Collected with: Type: ☒ YSI ProDSS ☒ Turbidity Meter ☐ Other: _____

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☐ disposable tubing; ☒ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): Clear w/some black particulates

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes
					Fe - 2.0 mg/L

QC samples

Duplicate Sample No: — Duplicate Time: — MS/MSD: ☐ Yes ☒ No

Signature: _____ **Date:** 5/7/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: BigB Date of Collection: 5/7/24

Task: GW Monit Field Personnel: HB

Purge Data

Well ID: MW-2A Secure: ☑ Yes ☐ No Ecology Tag #: BMM658 Casing Type/Diameter/Screened Interval PVC 2"

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) ____ Stripped (#) ____ Other Damage: —

Depth Sounder decontaminated Prior to Placement in Well: ☑ Yes ☐ No One Casing Volume (gal): ____

Depth of water (from TOC): 5.12 Time: 14:16

Total Depth (from log or field measurement): 12.41

After 5 minutes of purging (from top of casing): 5.12

Begin purge (time): 14:20 End purge (time): 15:05

Volume purged: 10L Purge water disposal method dnwm

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
14:25	5.12	1	6.94	2.54	406.1	6.10	12.3	5.9	clear no odor
14:30	5.12	2	6.70	0.69	395.1	3.79	12.3	-32.3	
14:35	5.12	3	6.69	0.48	390.3	2.13	12.3	-42.5	
14:40	5.12	4	6.68	0.43	388.6	2.24	12.3	-47.3	
14:45	5.12	5	6.68	0.40	389.4	2.30	12.3	-50.5	

Sampling Data

Sample No: MW-2A-050724 Location and Depth: MW-2A

Date Collected (mo/dy/yr): 5/7/24 Time Collected: 14:50 Weather: 50° windy

Type: ☑ Ground Water ☐ Surface Water Other: — Sample: ☑ Filtered ☐ Unfiltered Filter Type: 0.45 dissolved

Sample Collected with: ☐ Bailer ☑ Pump Other: — Type: ☑ Peristaltic ☐ Bladder ☐ Submersible Other: —

Water Quality Instrument Data Collected with: Type: ☑ YSI ProDSS ☑ Turbidity Meter ☐ Other: —

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☐ disposable tubing ☑ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): clear no odor Ferrous Iron: 2.5

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes

QC samples

Duplicate Sample No: — Duplicate Time: — MS/MSD: ☐ Yes ☒ No

Signature: [signature] Date: 5/7/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project:_____ Date of Collection: _____

Task:_____ Field Personnel: _____

Purge Data

Well ID: _____ Secure: ☐ Yes ☐ No Ecology Tag #: _____ Casing Type/Diameter/Screened Interval _____

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) _____ Stripped (#) _____ Other Damage: _____

Depth Sounder decontaminated Prior to Placement in Well: ☐ Yes ☐ No One Casing Volume (gal): _____

Depth of water (from TOC):_____Time:_____

Total Depth (from log or field measurement): _____

After 5 minutes of purging (from top of casing): _____

Begin purge (time): _____End purge (time): _____

Volume purged:_____ Purge water disposal method_____

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (_____)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments

Sampling Data

Sample No: _____ Location and Depth: _____

Date Collected (mo/dy/yr):_____ Time Collected: _____ Weather:_____

Type: ☐ Ground Water ☐ Surface Water Other: _____ Sample: ☐ Filtered ☐ Unfiltered Filter Type:_____

Sample Collected with: ☐ Bailer ☐ Pump Other: _____ Type: ☐ Peristaltic ☐ Bladder ☐ Submersible Other: _____

Water Quality Instrument Data Collected with: Type: ☐ YSI ProDSS ☐ Turbidity Meter ☐ Other: _____

Sample Decon Procedure: Sample collected with: ☐ decontaminated <u>all</u> tubing; ☐ disposable tubing ☐ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): _____

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes

QC samples

Duplicate Sample No: _____ Duplicate Time: _____ MS/MSD: ☐ Yes ☐ No

Signature: _____ **Date:** _____

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project:_____ Date of Collection: _____

Task:_____ Field Personnel: _____

Purge Data

Well ID: _____ Secure: ☐ Yes ☐ No Ecology Tag #: _____ Casing Type/Diameter/Screened Interval _____

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) ____ Stripped (#) ____ Other Damage: _____

Depth Sounder decontaminated Prior to Placement in Well: ☐ Yes ☐ No One Casing Volume (gal): _____

Depth of water (from TOC):_____Time:_____

Total Depth (from log or field measurement): _____

After 5 minutes of purging (from top of casing): _____

Begin purge (time): _____End purge (time): _____

Volume purged:_____ Purge water disposal method_____

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (_____)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments

Sampling Data

Sample No: _____ Location and Depth: _____

Date Collected (mo/dy/yr):_____ Time Collected: _____ Weather:_____

Type: ☐ Ground Water ☐ Surface Water Other: _____ Sample: ☐ Filtered ☐ Unfiltered Filter Type: _____

Sample Collected with: ☐ Bailer ☐ Pump Other: _____ Type: ☐ Peristaltic ☐ Bladder ☐ Submersible Other: _____

Water Quality Instrument Data Collected with: Type: ☐ YSI ProDSS ☐ Turbidity Meter ☐ Other: _____

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☐ disposable tubing ☐ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): _____

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes

QC samples

Duplicate Sample No: _____ Duplicate Time: _____ MS/MSD: ☐ Yes ☐ No

Signature: _____ **Date:** _____

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project:_____ Date of Collection: _____

Task:_____ Field Personnel: _____

Purge Data

Well ID: _____ Secure: ☐ Yes ☐ No Ecology Tag #: _____ Casing Type/Diameter/Screened Interval _____

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) _____ Stripped (#) _____ Other Damage: _____

Depth Sounder decontaminated Prior to Placement in Well: ☐ Yes ☐ No One Casing Volume (gal): _____

Depth of water (from TOC):_____Time: _____

Total Depth (from log or field measurement): _____

After 5 minutes of purging (from top of casing): _____

Begin purge (time): _____End purge (time): _____

Volume purged:_____ Purge water disposal method_____

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (_____)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments

Sampling Data

Sample No: _____ Location and Depth: _____

Date Collected (mo/dy/yr):_____ Time Collected: _____ Weather:_____

Type: ☐ Ground Water ☐ Surface Water Other: _____ Sample: ☐ Filtered ☐ Unfiltered Filter Type:_____

Sample Collected with: ☐ Bailer ☐ Pump Other: _____ Type: ☐ Peristaltic ☐ Bladder ☐ Submersible Other: _____

Water Quality Instrument Data Collected with: Type: ☐ YSI ProDSS ☐ Turbidity Meter ☐ Other:_____

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☐ disposable tubing ☐ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): _____

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes

QC samples

Duplicate Sample No: _____ Duplicate Time: _____ MS/MSD: ☐ Yes ☐ No

Signature: _____ **Date:** _____

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: CL-Ellensburg
Task: Sept 2024 GW

Date of Collection: 9/10/24
Field Personnel: HD

Purge Data

Well ID: MW-1A Secure: ☑ Yes ☐ No Ecology Tag #: _____ Casing Type/Diameter/Screened Interval 2" PVC

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) — Stripped (#) — Other Damage: —

Depth Sounder decontaminated Prior to Placement in Well: ☑ Yes ☐ No One Casing Volume (gal): _____

Depth of water (from TOC): 5.52 Time: 10:05

Total Depth (from log or field measurement): _____

After 5 minutes of purging (from top of casing): 5.51

Begin purge (time): 10:05 End purge (time): 1045

Volume purged: 6.9 L Purge water disposal method drum

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
10:10	5.51	1.0	6.30	1.48	634	23.6	21.2	136.4	
10:15	5.51	2.0	6.33	1.37	624	12.3	21.2	129.8	
10:20	5.51	2.5	6.37	1.27	628	4.68	21.4	122.0	
10:25	5.51	3.0	6.40	1.23	627	1.42	21.4	117.0	
10:30	5.51	4.0	6.42	1.21	625	1.52	21.5	114.4	

Sampling Data

Sample No: MW-1A-091024 Location and Depth: MW-1A

Date Collected (mo/dy/yr): 9/10/24 Time Collected: 10:35 Weather: 65° sunny

Type: ☑ Ground Water ☐ Surface Water Other: _____ Sample: ☑ Filtered ☐ Unfiltered Filter Type: 0.45 d.s metals

Sample Collected with: ☐ Bailer ☑ Pump Other: _____ Type: ☑ Peristaltic ☐ Bladder ☐ Submersible Other: _____

Water Quality Instrument Data Collected with: Type: ☑ YSI ProDSS ☑ Turbidity Meter ☐ Other: _____

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☑ disposable tubing ☐ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): clear no odor Fe: 0.0 mg/L

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes

QC samples

Duplicate Sample No: — Duplicate Time: — MS/MSD: ☐ Yes ☑ No

Signature: [signature] **Date:** 9/10/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: Big 13 Date of Collection: 9/10/24

Task: GW Monitoring Field Personnel: RA + HJ13

Purge Data

Well ID: MW-3 Secure: ☐ Yes ☐ No Ecology Tag #: _____ Casing Type/Diameter/Screened Interval PVC 2"

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) ____ Stripped (#) ____ Other Damage: _____

Depth Sounder decontaminated Prior to Placement in Well: ☐ Yes ☐ No One Casing Volume (gal): _____

Depth of water (from TOC): 5.79 Time: 1000

Total Depth (from log or field measurement): 10.95

After 5 minutes of purging (from top of casing): ↓

Begin purge (time): 1006 End purge (time): 1045

Volume purged: 8L Purge water disposal method Drum

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
1008	5.79	0.5	6.36	1.04	737	4.35	18.8	152.9	
1013	5.79	1.0	6.43	0.55	679	3.77	18.8	140.6	
1018	5.79	2.5	6.48	0.43	675	2.52	18.8	134.3	
1023	5.79	3.5	6.49	0.40	673	2.47	18.8	130.9	
1028	5.79	5.0	6.50	0.37	671	1.91	18.8	126.4	
1033	5.79	6.5	6.50	0.37	670	1.57	18.8	124.0	

Sampling Data

Sample No: MW-3-091024 Location and Depth: MW-3 @ 8.5'

Date Collected (mo/dy/yr): 9/10/24 Time Collected: 1040 Weather: Sunny, clear

Type: ☑ Ground Water ☐ Surface Water Other: _____ Sample: ☑ Filtered ☑ Unfiltered Filter Type: _____

Sample Collected with: ☐ Bailer ☑ Pump Other: _____ Type: ☑ Peristaltic ☐ Bladder ☐ Submersible Other: _____

Water Quality Instrument Data Collected with: Type: ☑ YSI ProDSS ☑ Turbidity Meter ☐ Other: _____

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☐ disposable tubing; ☑ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): Clear

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes
					Fe - 0 mg/L

QC samples

Duplicate Sample No: - Duplicate Time: - MS/MSD: ☐ Yes ☒ No

Signature: _____ **Date:** 9/10/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: Big B Date of Collection: 9/10/24

Task: GW Monitoring Field Personnel: RA + HJB

Purge Data

Well ID: MW-2A Secure: ☐ Yes ☐ No Ecology Tag #: _____ Casing Type/Diameter/Screened Interval PVC 2"

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#)____ Stripped (#)____ Other Damage: —

Depth Sounder decontaminated Prior to Placement in Well: ☑ Yes ☐ No One Casing Volume (gal): _____

Depth of water (from TOC): 5.75 Time: 1100

Total Depth (from log or field measurement): 12.09

After 5 minutes of purging (from top of casing): ↓

Begin purge (time): 1100 End purge (time): 1145

Volume purged: 8L Purge water disposal method Drum

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
1105	5.75	0.5	6.86	1.74	764	2.77	20.7	-70.2	
1110	5.76	1.0	6.56	0.54	763	2.71	21.1	-86.6	
1115	5.76	1.5	6.57	0.43	753	2.43	21.1	-89.7	
1120	5.77	2.0	6.57	0.40	750	1.82	21.1	-90.0	
1125	5.77	2.5	6.56	0.37	746	2.92	21.2	-89.1	
1130	5.77	3.0	6.57	0.35	745	2.69	21.4	-76.5	

Sampling Data

Sample No: MW-2A-091024 Location and Depth: MW-2A @ 11'

Date Collected (mo/dy/yr): 09/10/24 Time Collected: 1135 Weather: Clear, windy

Type: ☑ Ground Water ☐ Surface Water Other: _____ Sample: ☑ Filtered ☑ Unfiltered Filter Type: _____

Sample Collected with: ☐ Bailer ☐ Pump Other: _____ Type: ☑ Peristaltic ☐ Bladder ☐ Submersible Other: _____

Water Quality Instrument Data Collected with: Type: ☑ YSI ProDSS ☑ Turbidity Meter ☐ Other: _____

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☐ disposable tubing ☑ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): clear

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes
					Fe = 3.5 mg/L

QC samples

Duplicate Sample No: — Duplicate Time: — MS/MSD: ☐ Yes ☑ No

Signature: _____ **Date:** 9/10/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: CL-Ellensburg Date of Collection: 9/10/24

Task: 2024 Sept GW Field Personnel: HB

Purge Data

Well ID: MW-4B Secure: ☑ Yes ☐ No Ecology Tag #: BNM659 Casing Type/Diameter/Screened Interval 2" PVC

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) — Stripped (#) — Other Damage: —

Depth Sounder decontaminated Prior to Placement in Well: ☑ Yes ☐ No One Casing Volume (gal):

Depth of water (from TOC): 4.80 Time: 12:00

Total Depth (from log or field measurement):

After 5 minutes of purging (from top of casing): 4.81

Begin purge (time): 12:00 End purge (time): 1250

Volume purged: 6.0 L Purge water disposal method drum

Volume of Schedule 40 PVC Pipe				
Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
12:05	4.81	0.5	6.65	0.42	684	1.35	21.0	44.1	
12:10	4.80	1.0	6.66	0.33	684	2.94	21.1	0.1	
12:15	4.80	1.5	6.67	0.26	683	0.84	21.0	-54.5	
12:20	4.80	2.0	6.68	0.23	683	0.81	21.0	-76.4	
12:25	4.80	3.0	6.69	0.22	682	0.94	21.2	-88.6	
12:30	4.80	4.0	6.69	0.21	682	0.98	21.1	-94.6	

Sampling Data

Sample No: MW-4B-091024 Location and Depth: MW-4B

Date Collected (mo/dy/yr): 9/10/24 Time Collected: ~~1240~~ HB 1140 Weather: 70° sunny

Type: ☑ Ground Water ☐ Surface Water Other: Sample: ☑ Filtered ☐ Unfiltered Filter Type: 0.45 for 3 metals

Sample Collected with: ☐ Bailer ☑ Pump Other: Type: ☑ Peristaltic ☐ Bladder ☐ Submersible Other:

Water Quality Instrument Data Collected with: Type: ☐ YSI ProDSS ☑ Turbidity Meter ☐ Other:

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☐ disposable tubing ☑ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): Fe: 5.0 mg/L

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes

QC samples

Duplicate Sample No: — Duplicate Time: — MS/MSD: ☐ Yes ☑ No

Signature: Date: 9/10/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: Big B Date of Collection: 9/10/24

Task: GW Monitoring Field Personnel: RAT HJB

Purge Data

Well ID: MW-9A Secure: ☐ Yes ☐ No Ecology Tag #: _____ Casing Type/Diameter/Screened Interval 2" PVC

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) ____ Stripped (#) ____ Other Damage: —

Depth Sounder decontaminated Prior to Placement in Well: ☐ Yes ☐ No One Casing Volume (gal): _____

Depth of water (from TOC): 4.91 Time: 1235

Total Depth (from log or field measurement): 13.00

After 5 minutes of purging (from top of casing): ↓

Begin purge (time): 1235 End purge (time): 1300

Volume purged: 6 L Purge water disposal method Drum

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
1240	4.94	1.0	6.69	0.61	605	6.72	19.6	33.2	
1245	4.94	2.0	6.65	0.46	642	5.04	19.5	42.2	
1250	4.94	3.0	6.62	0.42	634	4.67	19.4	41.4	
1255	4.94	4.0	6.61	0.38	626	4.91	19.4	38.5	
1300	4.94	5.0	6.61	0.36	622	5.78	19.2	36.8	
1305	4.94	6.0	6.60	0.34	620	5.61	19.8	30.0	

Sampling Data

Sample No: MW-9A-091024 Location and Depth: MW-9A 11'

Date Collected (mo/dy/yr): 9/10/24 Time Collected: 1310 Weather: _____

Type: ☑ Ground Water ☐ Surface Water Other: _____ Sample: ☐ Filtered ☑ Unfiltered Filter Type: _____

Sample Collected with: ☐ Bailer ☑ Pump Other: _____ Type: ☑ Peristaltic ☐ Bladder ☐ Submersible Other: _____

Water Quality Instrument Data Collected with: Type: ☑ YSI ProDSS ☑ Turbidity Meter ☐ Other: _____

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☐ disposable tubing ☒ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): _____

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes
					Fe=0.2 mg/L

QC samples

Duplicate Sample No: — Duplicate Time: — MS/MSD: ☐ Yes ☑ No

Signature: _____ **Date:** 9/10/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: CL-Ellensburg Date of Collection: 9/10/24

Task: 2024 Sept GW Field Personnel: HB

Purge Data

Well ID: MW-1 Secure: ☑ Yes ☐ No Ecology Tag #: — Casing Type/Diameter/Screened Interval 2" PVC

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#) — Stripped (#) — Other Damage: —

Depth Sounder decontaminated Prior to Placement in Well: ☑ Yes ☐ No One Casing Volume (gal): —

Depth of water (from TOC): 5.35 Time: 1235

Total Depth (from log or field measurement): —

After 5 minutes of purging (from top of casing): 5.39

Begin purge (time): 1335 End purge (time): 1330

Volume purged: 6 L Purge water disposal method drum

Volume of Schedule 40 PVC Pipe				
Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
1240	5.39	0.5	6.76	0.48	682	2.06	20.8	43.8	Strong gas
1245	5.39	1.0	6.78	0.29	673	1.94	20.6	-20.7	odor
1250	5.39	1.5	6.78	0.24	665	1.21	20.7	-50.5	
1255	5.40	2.0	6.78	0.21	659	1.16	20.6	-69.7	
1300	5.40	3.0	6.78	0.19	656	1.44	20.5	-74.9	
1305	5.14	4.0	6.78	0.19	653	0.97	20.5	-82.6	

Sampling Data

Sample No: MW-1-091024 Location and Depth: MW-1

Date Collected (mo/dy/yr): 9/10/24 Time Collected: 1310 Weather: 75° sunny

Type: ☑ Ground Water ☐ Surface Water Other: — Sample: ☑ Filtered ☐ Unfiltered Filter Type: 0.45 d.s metals

Sample Collected with: ☐ Bailer ☑ Pump Other: — Type: ☑ Peristaltic ☐ Bladder ☐ Submersible Other: —

Water Quality Instrument Data Collected with: Type: ☑ YSI ProDSS ☑ Turbidity Meter ☐ Other: —

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☑ disposable tubing ☐ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): Clear strong gas odor Fe: 2.5 mg/L

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes

QC samples

Duplicate Sample No: MW-101-091024 Duplicate Time: 1320 MS/MSD: ☐ Yes ☑ No

Signature: [signature] **Date:** 9/10/24

GROUNDWATER OR SURFACE WATER SAMPLE COLLECTION FORM

Project: Big B GW Monitoring Date of Collection: 9/10/24

Task: Field Personnel: RA + HJ B

Purge Data

Well ID: MW-2 Secure: ☐ Yes ☐ No Ecology Tag #: _____ Casing Type/Diameter/Screened Interval 2"

Replacement Required: ☐ Monument ☐ Lid ☐ Lock ☐ Bolts: Missing (#)____ Stripped (#)____ Other Damage: _____

Depth Sounder decontaminated Prior to Placement in Well: ☐ Yes ☐ No One Casing Volume (gal): _____

Depth of water (from TOC): 5.17 Time: _____

Total Depth (from log or field measurement): 14.14

After 5 minutes of purging (from top of casing): _____

Begin purge (time): 1345 End purge (time): 1420

Volume purged: 5L Purge water disposal method Drum

Volume of Schedule 40 PVC Pipe

Diameter	O.D.	I.D.	Volume (Gal/Linear Ft.)	Weight of Water (Lbs/Lineal Ft.)
1 ¼"	1.660"	1.380"	0.08	0.64
2"	2.375"	2.067"	0.17	1.45
3"	3.500"	3.068"	0.38	3.2
4"	4.500"	4.026"	0.66	5.51
6"	6.625"	6.065"	1.5	12.5

Time	Depth to Water (ft)	Vol. Purged (L)	pH (s.u.)	DO (mg/L)	Specific Conductivity (µs/cm)	Turbidity (NTU)	Temp (°C)	ORP (mV)	Comments
1350	5.22	1	6.72	6.48	766	3.19	22.5	-100.5	
1355	5.22	2	6.66	0.35	761	3.02	22.2	-106.4	
1400	5.22	3	6.65	0.31	760	2.74	22.2	-110.8	
1405	5.22	4	6.65	0.28	759	2.30	21.9	-112.7	
1410	5.22	5	6.65	0.26	759	2.25	21.8	-114.2	

Sampling Data

Sample No: MW-2-091024 Location and Depth: _____

Date Collected (mo/dy/yr): 9/10/24 Time Collected: 1415 Weather: Sunny, Windy

Type: ☑ Ground Water ☐ Surface Water Other: _____ Sample: ☐ Filtered ☑ Unfiltered Filter Type: _____

Sample Collected with: ☐ Bailer ☑ Pump Other: _____ Type: ☑ Peristaltic ☐ Bladder ☐ Submersible Other: _____

Water Quality Instrument Data Collected with: Type: ☑ YSI ProDSS ☑ Turbidity Meter ☐ Other: _____

Sample Decon Procedure: Sample collected with: ☐ decontaminated all tubing; ☑ disposable tubing ☐ dedicated silicon and poly tubing; ☐ dedicated tubing replaced

Sample Description (Color, Turbidity, Odor, Other): _____

Sample Analyses

Analyte	Analysis Method	Sample Container	Quantity	Preservative	Notes
					Fe = 4.0 mg/L

QC samples

Duplicate Sample No: — Duplicate Time: — MS/MSD: ☐ Yes ☑ No

Signature: _____ **Date:** 9/10/24

Attachment 2
Monitored Natural Attenuation
at Big B Mini Mart Site

Attachment 2
Monitored Natural Attenuation at Big B Mini Mart Site

INTRODUCTION AND PURPOSE

Monitored natural attenuation (MNA) is the observed, unaided reduction of contaminant concentration and mass by using the natural assimilative capacity of a groundwater/soil system in situ. This ubiquitous process includes a variety of physical, chemical, or biological attributes under favorable conditions to reduce the toxicity, mobility, and concentration of contaminants without human intervention. The reduction in concentrations is due primarily to several fate and transport processes including destructive processes, such as biodegradation, and nondestructive mechanisms, such as dilution, sorption, volatilization, and dispersion (USEPA 1999).

Natural attenuation processes typically occur at all contaminated sites but to varying degrees of effectiveness depending on the types and concentrations of contaminants present and the physical, chemical, and biological characteristics of the soil and groundwater. One of the most important components of natural attenuation at a petroleum-contaminated site is biodegradation. Contaminant biodegradation is largely based upon microbial respiration. In respiration, microbes gain energy from the consumption or oxidation of electron donors coupled to the utilization or reduction of electron acceptors. Contaminants will either serve as electron donors or electron acceptors. For example, during the aerobic metabolism of petroleum hydrocarbons in the biodegradation process, oxygen is the electron acceptor, while hydrocarbons are the electron donors and may eventually be oxidized completely to CO_2. Under anaerobic conditions, alternative electron acceptors, such as nitrate and sulfate, may be utilized in contaminant oxidation in the absence of oxygen. In general, biodegradation processes follow an order of favorable electron acceptor availability: $O_2 \rightarrow Mn^{4+} \rightarrow NO^{3-} \rightarrow Fe^{3+} \rightarrow SO_4^{2-} \rightarrow CH_4 \rightarrow CO_2$. The microbes will utilize the next available electron acceptor in the above order when one acceptor is scarce or absent.

The occurrence of biodegradation can be determined from site analytical monitoring of the changes in groundwater bulk geochemistry, the presence of metabolic by-products, and the depletion of electron acceptors and donors. As a result, several chemical compounds in groundwater, including nitrate, manganese, ferrous iron, sulfate, methane, and total alkalinity can be measured and used as indicators of natural attenuation. Their presence or absence in comparison to background levels and dissolved oxygen (DO) levels can therefore be used to infer biodegradative processes. DO levels and oxidation–reduction potential (ORP) are used to assess whether biodegradation is aerobic or anaerobic.

Typically, these parameters are measured in monitoring well locations throughout light non-aqueous phase liquid (LNAPL) source area and dissolved groundwater contaminant plume as well as upgradient and downgradient locations that are not impacted by contaminants. Parameters are compared to the approximate distances of monitoring locations from the former LNAPL plume boundary and/or source area as well as measured concentrations of diesel-range organics (DRO), oil-range organics (ORO), and/or gasoline-range organics (GRO; Ecology 2005). MNA is indicated by a depletion in DO, nitrate, and sulfate and increases in manganese (MN^{2+}), ferrous iron (Fe^{3+}), methane (CH_4), and total alkalinity within the contaminant plume.

GROUNDWATER MONITORED NATURAL ATTENUATION AT THE BIG B MINI MART SITE

Multiple electron acceptors or metabolic by-products were measured in groundwater to determine if natural attenuation is occurring at the Site. Groundwater samples were collected from 7 monitoring wells between May 2023 and September 2024 in four semiannual monitoring events designed to capture seasonal variations of Site groundwater conditions. Samples were collected using the methodologies described in the Cleanup Action Plan (CAP; Ecology 2020) and analyzed for the following MNA parameters:

- DO and ORP by YSI DSS Pro field meter (measured during sampling)
- Nitrate and sulfate by USEPA Method 300.0
- Manganese (soluble) by USEPA Method 200.8
- Methane by RSK-175
- Ferrous Iron (soluble) by Hach Field Test Kit

All groundwater samples were additionally analyzed for Site contaminants of concern: GRO by NWTPH-Gx and DRO and ORO by NWTPH-Dx (with and without silica gel cleanup [SGC]). Per Ecology's November 2023 *Guidance for Silica Gel Cleanup in Washington State*, samples were analyzed with SGC to quantify the proportion of petroleum hydrocarbons to non-petroleum organics, which include polar metabolites. Polar metabolites are produced in groundwater when dissolved petroleum is weathered over time through a variety of processes, including biodegradation, which results in polar non-petroleum compounds. Naturally occurring organic compounds in groundwater (i.e., peat, bark, leaf litter) can also contribute to the amount of polar, non-petroleum compounds. As petroleum weathers in groundwater, the percentage of polar metabolites typically increases, while the toxicity of the overall mixture subsequently decreases (Ecology 2023).

To document and assess MNA, Ecology recommends including at least one upgradient location with uncontaminated groundwater, one location within the source (most impacted) area, two wells near the contaminated plume center line, and one downgradient "sentinel" well with uncontaminated groundwater in the sampling plan (Ecology 2005). At the Big B Mini Mart Site, MW-1A and MW-3 are considered upgradient/background monitoring locations that are unimpacted by petroleum releases, while MW-2A and MW-4B are located closest to the two source areas. The remaining monitoring wells, MW-9A, T-MW-1, and T-MW-2, are located downgradient of the source area and represent contaminant concentrations throughout the dissolved phase plume. Due to the proximity of another cleanup site (Toads Express Mart & Deli 113; Ecology Cleanup Site ID: 12418) located directly south and downgradient from the Site, a clean, downgradient monitoring well was not available for sampling.

MONITORED NATURAL ATTENUATION RESULTS

MNA analytical results and field parameters for the seven monitoring locations are shown in Table 2 of the 2024 Data Summary Memorandum. The parameters were interpreted by plotting their concentration in two different approaches: (1) MNA parameters of upgradient/background monitoring locations versus monitoring locations within the dissolved-phase petroleum plume and (2) MNA parameters versus the sum of DRO, ORO, and GRO concentrations (total petroleum hydrocarbons (TPH). These plots were constructed to document varying levels and stages of biodegradation within the dissolved-phase plumes

and the distinct difference between parameters in upgradient well versus the dissolved-phase plume. The MNA parameters were plotted against TPH due to there being two separate releases, which is evidenced by overlapping DRO/ORO and GRO detections in some Site monitoring wells.

MNA parameter results from Site monitoring wells are shown in Figures 1 through 2, which follow the order of favorable electron acceptor availability, while MNA parameters versus TPH are shown in Figures 3 and 4. DO results are shown in Figure 1 and indicate that DO concentrations are generally lower at monitoring locations within the dissolved phase plume relative to background, suggesting that natural attenuation due to aerobic respiration is occurring in Site groundwater. Similarly, nitrate and sulfate concentrations are overall lower within the dissolved phase plume relative to background (Figure 1), which provides evidence that anaerobic biodegradation in the form of denitrification and sulfate reduction is occurring in Site groundwater. Figure 3 shows that groundwater with low or no detectable TPH contains DO, nitrate, and sulfate at higher concentrations relative to monitoring wells with higher TPH concentrations, providing further evidence for aerobic respiration and anaerobic biodegradation.

Dissolved manganese, ferrous iron, and methane data show opposite trends to the DO, nitrate, and sulfate data: dissolved manganese, ferrous iron, and methane concentrations increase within the dissolved phase groundwater plume and correspond with monitoring well locations with high TPH concentrations (Figures 2 and 4). These data indicate that anaerobic biodegradation via manganese and iron reduction and methanogenesis is likely occurring within the dissolved phase groundwater plume at the Site. The presence of elevated methane levels within the groundwater plume are indicative of reducing conditions, which are confirmed by negative ORP measurements and low DO concentrations at monitoring locations within the dissolved phase plume.

Polar Metabolic By-Products

Table 2 of the 2024 Data Summary Memorandum shows NWTPH-Dx results with and without SGC as well as the concentrations of non-polar hydrocarbons, polar metabolites, and naturally occurring organics, which were calculated per Section 3.2.1 of the *Guidance for Silica Gel Cleanup in Washington State* (Ecology 2023). Results show that a substantial portion of the NWTPH-Dx results (without SGC) at monitoring locations within the dissolved phase plume can be accounted for by polar metabolites, which account for between 60 to 90% of the NWTPH-Dx result in all samples except for the fall sample collected from MW-1 (Toad's), which had an elevated post-SGC NWTPH-Dx concentration. The presence of substantial polar metabolites within the dissolved-phase plume suggest that petroleum hydrocarbons have and are actively weathering via biodegradation, which provides further evidence that MNA is occurring at the Site.

CONCLUSIONS

Analytical groundwater results collected between 2023 and 2024 at the Site provide strong evidence that natural attenuation of groundwater contaminants by aerobic and anaerobic biodegradation is occurring in Site groundwater, particularly at the monitoring locations with the greatest mass of dissolved phase TPH in groundwater. Because these monitoring results were successful in establishing MNA as an ongoing process at the Site, Site groundwater will not be analyzed for the full-suite MNA parameters in future monitoring events. Field parameters, such as DO and ORP, will continue to be collected as part of the low-

flow sampling procedure, and groundwater samples for NWTPH-Dx analyses will be analyzed with and without SGC to assess the concentration of polar metabolites in Site groundwater. These parameters will provide necessary lines of evidence for assessing ongoing MNA at the Site.

REFERENCES

U.S. Environmental Protection Agency (USEPA). 1999. *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites.* OSWER Directive 9200.4-17P. April.

Washington State Department of Ecology (Ecology). 2005. *Guidance on Remediation of Petroleum-Contaminated Ground Water by Natural Attenuation.* Publication No. 05-09-091. July.

_____. 2020. *Cleanup Action Plan: Big B Mini Mart Site, Ellensburg, WA*. Prepared by Floyd|Snider. November.

_____. 2023. *Guidance for Silica Gel Cleanup in Washington State*. Publication No. 22-09-059. November.

LIST OF ATTACHMENTS

Figure 1 DO, Sulfate, Nitrate, and ORP Concentrations

Figure 2 Dissolved Manganese, Ferrous Iron, and Methane Concentrations

Figure 3 DO, Nitrate, Sulfate, and ORP vs. Total TPH

Figure 4 Dissolved Manganese, Ferrous Iron, and Methane vs. Total TPH

Attachment 2

Figures

Figure 1. DO, Sulfate, Nitrate, and ORP Concentrations

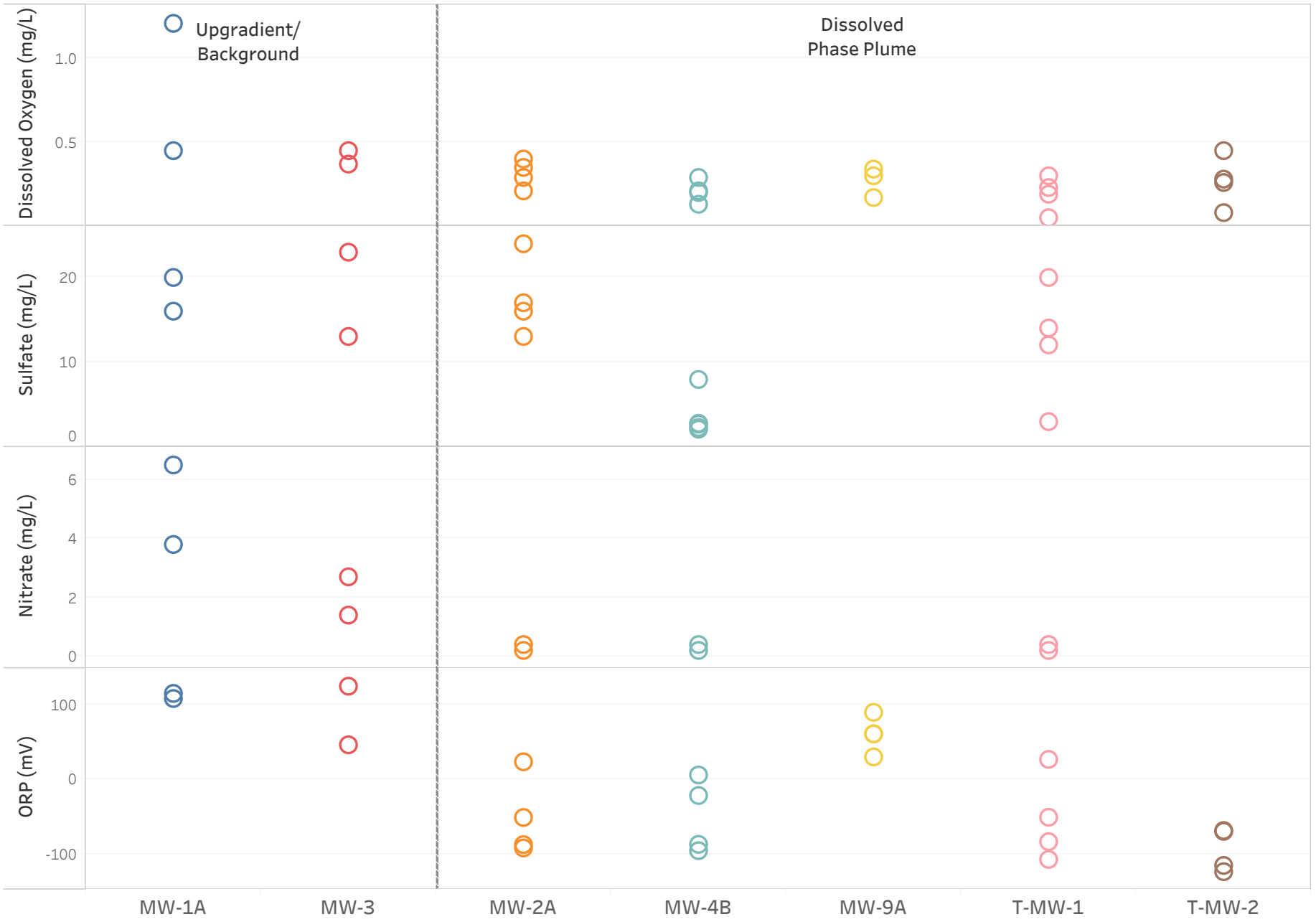


Figure 2. Dissolved Manganese, Ferrous Iron, and Methane Concentrations

Figure 3. DO, Nitrate, Sulfate, and ORP vs. Total TPH

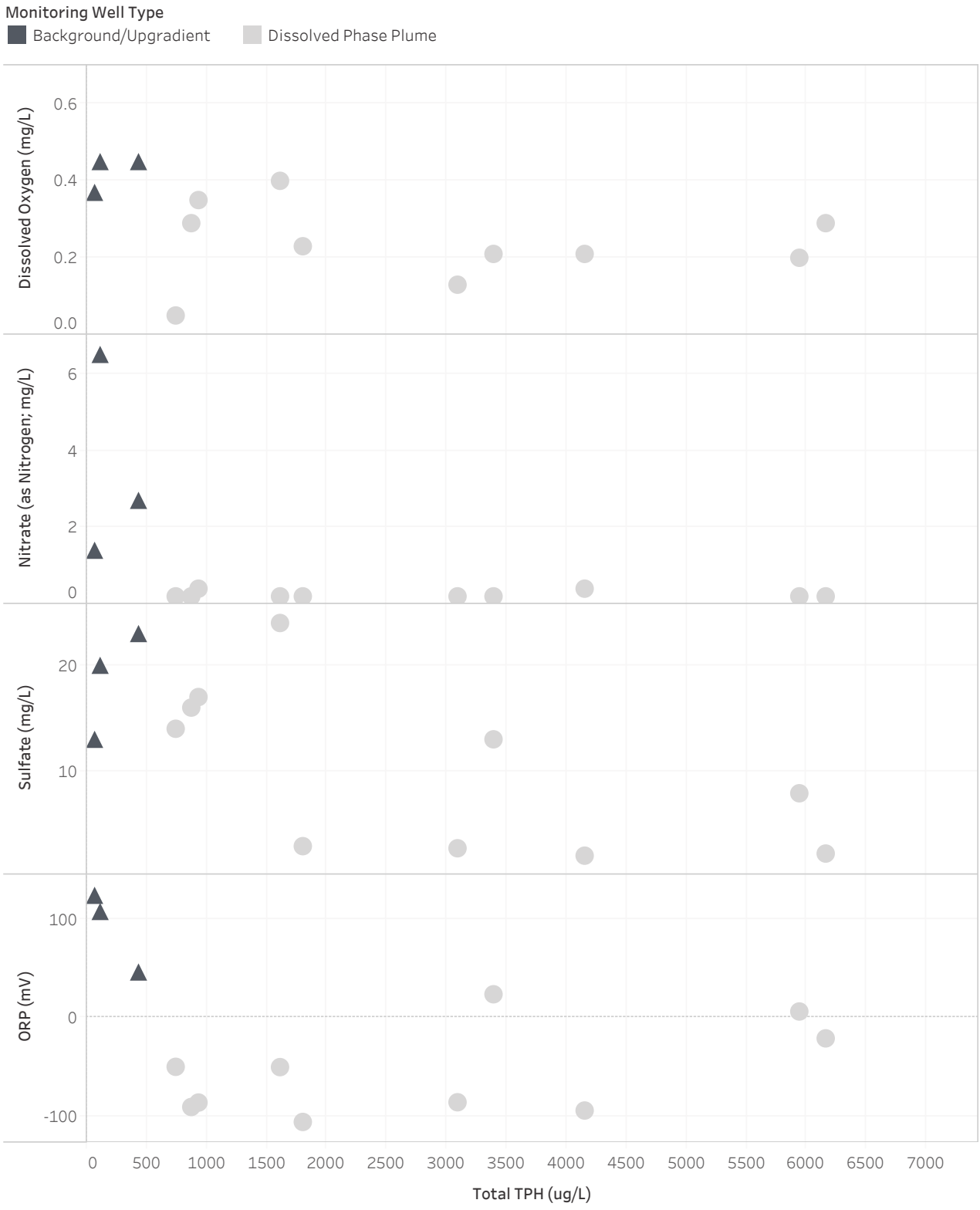


Figure 4. Dissolved Manganese, Ferrous Iron, and Methane vs. Total TPH