2023 ANNUAL REPORT FOR GROUNDWATER MONITORED NATURAL ATTENUATION

Pulp & Tissue Mill RAU, Georgia-Pacific West Site

Prepared for: Port of Bellingham

Project No. AS140298A-19 • February 26, 2024 • FINAL

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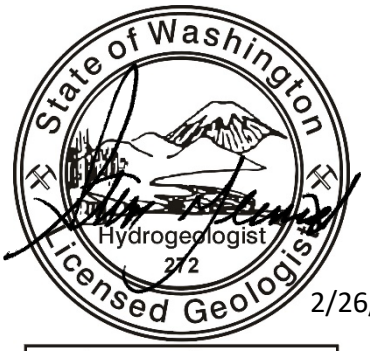

2/26/2024

Steve J. Germiat

Amy Tice, LG
Project Geologist
atice@aspectconsulting.com

Steve Germiat, LHG
Principal Hydrogeologist
sgermiat@aspectconsulting.com

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1 Background for Groundwater Monitoring Program

This report presents results from the 2023 compliance monitoring for the groundwater monitored natural attenuation (MNA) cleanup action selected by the Washington State Department of Ecology (Ecology) for the Pulp and Tissue Mill (PTM) Remedial Action Unit (RAU) at the Georgia-Pacific West Site (Site). The PTM RAU is being cleaned up under the terms of Consent Decree No. 14207008 (Decree) between the Port of Bellingham (Port) and Ecology. Monitoring of the groundwater MNA cleanup action is being conducted by Aspect Consulting (Aspect) in accordance with the Compliance Monitoring Plan for Groundwater MNA (CMP; Aspect, 2015), which was reviewed and approved by Ecology prior to initiation of the monitoring program.

As described in the Cleanup Action Plan for the PTM RAU (CAP; Ecology, 2014), the highest beneficial use of Site groundwater is discharge to marine water and sediment, not potable use, and groundwater cleanup levels (CULs) for the PTM RAU were established accordingly. Groundwater CULs for individual contaminants are included in the data tables for this report (Tables 1 and 2).

At the time of the CAP preparation in 2014, the contaminants that exceeded CULs in PTM RAU groundwater included:

- Acidic pH and selected metals in the Acid Plant Subarea
- Chlorinated solvent volatile organic compounds (VOCs), tetrachloroethene (PCE), and vinyl chloride (VC) in the LP-MW01 Subarea
- Selected metals in the Miscellaneous Dissolved Metals Exceedances Area (termed here Miscellaneous Metals Area)

Figure 1 depicts the locations of these three areas. Subsequent to the CAP, chlorinated VOC concentrations in the LP-MW01 Subarea were demonstrated to meet groundwater cleanup levels by the end of the 2017 monitoring period; therefore, monitoring for that subarea was terminated, as documented in the 2017 MNA Monitoring Annual Report (Aspect, 2018a). The LP-MW01 Subarea is therefore not discussed further in this report; however, well LP-MW01 remains used for monitoring the Miscellaneous Metals Area.

As described in the 2017 MNA Monitoring Annual Report (Aspect, 2018a), wells AA-MW01 through AA-MW04, FH-MW01, and GF-MW01 were decommissioned in 2016 prior to construction of the RAU-wide environmental cap and, following cap construction, were replaced with wells that were essentially identical in construction and location. The replacement well names included an ‘R’ suffix (e.g., AA-MW01R). Wells AA-MW01R and FH-MW01R were subsequently decommissioned in early 2021 to accommodate construction of Harcourt Development’s (Harcourt) Granary Avenue Waterfront Residential project, the outline of which is depicted on Figure 1. Those wells will be reestablished for monitoring, in consultation with Ecology, following completion of that redevelopment project. Figure 1 depicts locations of the monitoring wells that have been and are currently being monitored during the MNA program, including wells that were not accessible for monitoring during the 2023 monitoring.

This report documents the groundwater MNA compliance monitoring data collected to date and, in accordance with Section 2.2 of the CMP, presents the plan for the next year of monitoring.

Following this Background section, the structure of the report is as follows:

- Section 2 – Describes the groundwater sampling and analysis completed in 2023.
- Section 3 – Contains an evaluation of the groundwater analytical data with respect to compliance with CULs and long-term trends.
- Section 4 – Presents the plan for monitoring in 2024.

2 2023 Groundwater Sampling and Analysis

In accordance with the CMP (Aspect, 2015) and the findings from the 2022 MNA Monitoring Annual Report (Aspect, 2023), semiannual groundwater monitoring was performed in April and October of 2023. The wells sampled are depicted on Figure 1 and their chemical analyses[1] in 2023 were as follows:

Acid Plant Subarea

- Within the active construction area for Harcourt's residential redevelopment project, wells FH-MW01R and AA-MW01R were previously decommissioned and, therefore, could not be monitored in 2023. In addition, wells GF-MW01R and BC-MW05 remained inaccessible for monitoring in 2023 because they were located within the active construction active (fenced area). Section 4 describes the planned re-establishment of these wells as part of the MNA monitoring program in 2024.
- The two groundwater samples from well AA-MW04R were analyzed for five dissolved metals: arsenic, cadmium, copper, nickel, and zinc.
- Because wells AA-MW04R and FH-MW01R did not yet meet cleanup levels at the end of 2022, the following wells positioned outside the Acid Plant Subarea were also monitored in accordance with the CMP:
  - Cross-gradient from the Acid Plant Subarea, groundwater parameters, including pH, were measured in the field at wells AA-MW02R and AA-MW03R.[2] If the field measurement of groundwater pH was less than pH 6.2 in a well, then that well was sampled for analysis of the same five dissolved metals as were analyzed at AA-MW04R. During 2023:

[1] Groundwater parameters (temperature, pH, electrical conductance, and oxidation reduction potential [ORP]) were also measured in the field for each monitoring location and event.

[2] Well AA-MW03R had pH exceeding the CUL, but no dissolved metals exceedances during the RI/FS period (2009–2013), so is considered on the edge of the Acid Plant Subarea.

- Well AA-MW03R had a measured pH less than 6.2 during the April and October 2023 monitoring events, so groundwater samples were collected for analysis of the five dissolved metals during both events.
- Well AA-MW02R had a pH of greater than 6.2 during both monitoring events in 2023. Regardless of pH, well AA-MW02R was sampled for dissolved copper during each round to provide monitoring downgradient of the Miscellaneous Metals Area as required by the CMP and described below.

Miscellaneous Metals Area

- Within the Miscellaneous Metals Area, groundwater samples from wells LP-MW01 and SC-MW02R were analyzed for dissolved copper.
- Because wells LP-MW01 and SC-MW02R did not meet CULs at the end of 2022, downgradient wells LB-MW01R and AA-MW02R were sampled for dissolved copper in accordance with the CMP.

3 Data Evaluation

The following subsections describe the analytical results from the 2023 groundwater monitoring events for the Acid Plant Subarea and Miscellaneous Metals Area. The 2023 results are compared with CULs and with data from prior monitoring events to assess temporal trends in groundwater pH and metals concentrations. Tables 1 and 2 present the analytical results over the entire period of monitoring for the Acid Plant Subarea and Miscellaneous Metals Area, respectively.

Based on Aspect's independent quality assurance validation of the 2023 analytical data, no data were qualified, and the data are usable for their intended purpose. Appendix A provides Aspect's data validation report and the laboratory reports generated by OnSite Environmental[3] for the two rounds of 2023 analytical data.

3.1 Acid Plant Subarea

3.1.1 pH

The groundwater pH exceeded the CUL (pH 6.2)[4] in well AA-MW04R, located within the acidic source area,[5] during the October 2023 monitoring event; and at cross-gradient well AA-MW03R[6] during both 2023 monitoring events. The crossgradient shoreline well

[3] An analytical laboratory accredited by Ecology and located in Redmond, Washington.

[4] While the term "exceedance" typically refers to a measurement greater than a cleanup level, for acidic pH, it refers to a measurement less than the pH 6.2 CUL.

[5] The 2004 data from the acidic source area are from well GF-MW02, which was located just mill-west of well AA-MW04/04R (Figure 1), but which could not be found at the start of the RI in 2009.

[6] This well has data from 2009 to 2023 only; there was not a monitoring well in the AA-MW03R location in 2004.

GF-MW01R, located mill-west of the Acid Plant Subarea, could not be monitored in 2023 as described in Section 2. The measured pH met the CUL at the cross-gradient inland well AA-MW02R during both 2023 monitoring events.

Within the Acid Plant Subarea as a whole, measured pH levels show a gradual, long-term improvement (increase in pH) relative to the earliest measurements in 2004, but with considerable short-term variation. Figure 2 graphically illustrates the long-term pH trends at three well locations within the Subarea since their monitoring began (2004 for AA-MW04R and FH-MW01R[7]; 2009 for AA-MW03R). On all figures in this report, the groundwater pH vertical axis is plotted in reverse order, so that points higher on the axis are farther from the CUL (pH 6.2), consistent with how metals concentrations are plotted. The average annual groundwater pH in these three pH-impacted wells over the past 5 years (no data from decommissioned well FH-MW01R over past 3 years) are tabulated below.

Well	Area represented by samples from well	Average Groundwater pH (CUL = 6.2)					
		2018	2019	2020	2021	2022	2023
AA-MW04R	Acidic metals plume source	4.8	5.5	6.3	5.8	6.4	6.2
FH-MW01R	Downgradient from source	5.5	5.7	5.0	NA	NA	NA
AA-MW03R	Cross-gradient from source	4.5	5.6	5.8	6.2	5.7	5.7

NA: Not monitored.

Observations regarding groundwater pH for wells AA-MW-04R and AA-MW03R are as follows:

- Within the footprint of the historical Acid Plant where the release(s) of acid occurred (source area well AA-MW04R), the pH reading measured during the April 2023 monitoring event (6.29) was greater than the CUL. The pH measured during the October 2023 monitoring event (6.15) slightly exceeded the CUL (see Table 1, attached). Despite the anomalously low pH of 5.5 measured in October 2021, the acidic pH within the source area has shown substantial improvement from the start of monitoring in 2004 (Figure 2) and the average pH of 6.3 over the last two years complies with the CUL.
- At cross-gradient well AA-MW03R, the pH readings during both 2023 monitoring events (5.73 and 5.76) increased from the anomalously low October 2022 value of 5.55 that was discussed in the 2022 Annual Report (Table 1). The reason for this well's pH being lower on average in 2022 and 2023 than in 2020 and 2021 is uncertain.

[7] Combining data from original wells and replacement wells in those locations.

3.1.2 Dissolved Metals

AA-MW04R

During the 2023 monitoring events, dissolved arsenic and dissolved cadmium concentrations at source area well AA-MW04R remained below their respective CULs, while dissolved copper and nickel concentrations exceeded their respective CULs. The 2023 copper, nickel, and zinc concentrations detected were higher than measured during October 2022, which was the first monitoring event over the 18-year period of monitoring in which the concentration of every metal met its CUL; however, the 2023 concentrations were below those detected in October 2021 and April 2022 (Table 1). Dissolved arsenic concentrations at AA-MW04R have been below CUL for more than four consecutive sampling events, demonstrating compliance with the CUL in accordance with the CMP (Aspect, 2015).

Plotting the groundwater pH and the summed concentrations of the five dissolved metals monitored (arsenic, cadmium, copper, nickel, zinc) over time illustrates a general improvement in groundwater quality since the October 2016 concentration spike created by formation disturbance during drilling of replacement well AA-MW04R, which was described in the 2018 MNA Monitoring Annual Report (Aspect, 2018b). A general correlation between lower pH and higher metals concentrations is also apparent over the past 5 years of data, although the correlation is not perfect (Figure 3).[8]

FH-MW01R

Well FH-MW01R was decommissioned and could not be sampled in 2023, as described in Section 2. Accordingly, no analysis of metals trends beyond that presented in the 2020 MNA Monitoring Annual Report (Aspect, 2021) can be conducted.

AA-MW03R

At well AA-MW03R, located on the mill-west edge of the Acid Plant Subarea (Figure 1), the concentrations of dissolved metals were less than CULs (nondetect) despite the pH being less than the pH 6.2 CUL during both 2023 events. The data indicate that the elevated dissolved nickel concentrations first observed at well FH-MW01 in April 2018, and then at well AA-MW03R in January 2019 (Table 1), and resulting from the City of Bellingham's adjacent Granary Avenue-Laurel Street (GALS) construction as first described in Aspect (2018b), have abated.

AA-MW01R

Shoreline well AA-MW01R could not be sampled in 2023 as described in Section 2. Accordingly, no analysis of metals trends beyond that presented in the 2020 Annual Report (Aspect, 2021) can be conducted.

Other Cross-Gradient and Downgradient Wells

During both 2023 monitoring events, dissolved copper remained nondetect at well AA-MW02R located mill-east of the Acid Plant Subarea (Figure 1; Table 1). Wells GF-

[8] Figure 3 does not extend back to 2004 because adjacent 2004 well GF-MW02 never had elevated metals concentrations in groundwater, despite having highly acidic groundwater, so it is not meaningful to combine those data for analysis of long-term metals trends back to 2004.

MW01R and BC-MW05 were inaccessible and could not be monitored in 2023, as described in Section 2.

3.2 Miscellaneous Metals Area

The Miscellaneous Metals Area encompasses two wells, LP-MW01 and SC-MW02R, that had low-level exceedances of selected metals without pH impacts during the 2009-2010 monitoring conducted for the Site remedial investigation/feasibility study (RI/FS).

LP-MW01

Groundwater pH at well LP-MW01 complied with the CUL during both 2023 monitoring events, consistent with prior data. The dissolved copper concentrations detected in the April and October 2023 samples both exceeded the CUL. The seasonal pattern of higher concentrations in the dry season versus the wet season continues with the 2023 monitoring data (Table 2, attached). The anomalously high October 2022 result reversed the general trend of declining average annual copper concentrations that had been observed between 2017 and 2021; however, the 2023 average annual copper concentration was lower than the 2022 annual average, as indicated in the tabulation below.

Year	Average Annual Copper in µg/L
2017*	7.7
2018	7.5
2019	6.2
2020	6.0
2021	5.8
2022	14.5
2023	10.4

* 2017 average includes October 2016 data (see Table 2)

SC-MW02R

At well SC-MW02R, the dissolved copper concentration was below the CUL during both 2023 monitoring events (Table 2). The resulting 2023 average annual copper concentration (2.1 µg/L) is the lowest average annual copper since 2017, as noted in the tabulation below.

Year	Average Annual Copper in µg/L
2017*	3.9
2018	7.8
2019	7.8
2020	3.1
2021	2.6
2022	4.6
2023	2.1

* 2017 average includes October 2016 data (see Table 2)

Downgradient Wells AA-MW02R and LB-MW01R

At well AA-MW02R, downgradient of the Miscellaneous Metals Area, dissolved copper remained nondetect, consistent with prior results (Table 2).

At the other downgradient well, LB-MW01R, dissolved copper was above the CUL during both 2023 monitoring events, with an anomalously high concentration (10 µg/L) during the October 2023 event (Table 2). As a result of the October value, the 2023 average annual dissolved copper concentration at the well was the highest since 2017, as indicated in the tabulation below.

Year	Average Annual Copper in µg/L
2017*	5.2
2018	5.6
2019	5.0
2020	5.6
2021	4.6
2022	3.6
2023	7.2

* 2017 average includes October 2016 data (see Table 2)

4 Plan for 2024 MNA Monitoring

Following completion of the 2023 MNA monitoring, dissolved arsenic from AA-MW04R qualifies for exclusion from the monitoring program based on the decision framework of the CMP (Aspect, 2015). No other wells or analytes qualify for exclusion from the monitoring program based on the CMP. As described in the 2015 CMP and reiterated above, wells AA-MW02R, AA-MW03R, and LB-MW01 must be monitored until other specified wells reach CULs.

It is expected that, in 2024, the Harcourt residential development will be complete to the point that wells GF-MW01R and BC-MW05 can again be accessed, and decommissioned wells AA-MW01R and FH-MW01R can be replaced, and their monitoring can be reinitiated. Figure 4 shows the planned approximate locations for replacement wells AA-MW01R2 and FH-MW01R2 with the intent they will be located on City of Bellingham (City) property just outside the Harcourt property boundary: AA-MW01R2 within the City's planned Waypoint Park expansion, and FH-MW01R2 within the City's Granary Avenue easement. Specific locations of the replacement wells will be coordinated with appropriate City staff and account for existing and planned infrastructure and subsurface utilities. If the physical condition of wells GF-MW01R and BC-MW05 is deteriorated badly, they will also be decommissioned and replaced at the same time.

The semiannual groundwater MNA monitoring program will be conducted in April and October 2024, including whichever of the reinitiated wells can be re-established and monitored by April. For the wells that were sampled in 2023, the same well-specific

analytes will be measured, with the exception of excluding dissolved arsenic from AA-MW04R because it complies with the CUL as described above. Monitoring of reinitiated wells GF-MW01R, BC-MW05, AA-MW01R, and FH-MW01R will continue from where it was left off in 2020, in accordance with the CMP. Table 3 lists the planned wells and analytes for the 2024 monitoring program.

Following receipt of data from the 2024 monitoring events, an annual report will be prepared that analyzes the collective data and re-evaluates the scope of the monitoring program for the subsequent (2025) monitoring, in accordance with the CMP.

5 References

Aspect Consulting, LLC (Aspect), 2015, Compliance Monitoring Plan for Groundwater Monitored Natural Attenuation, Pulp & Tissue Mill RAU, Georgia-Pacific West Site, July 7, 2015.

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Aspect Consulting, LLC (Aspect), 2021, 2020 Annual Report for Groundwater Monitored Natural Attenuation, Pulp & Tissue Mill RAU, Georgia-Pacific West Site, January 19, 2021.

Aspect Consulting, LLC (Aspect), 2022, 2021 Annual Report for Groundwater Monitored Natural Attenuation, Pulp & Tissue Mill RAU, Georgia-Pacific West Site, February 15, 2022.

Aspect Consulting, LLC (Aspect), 2023, 2022 Annual Report for Groundwater Monitored Natural Attenuation, Pulp & Tissue Mill RAU, Georgia-Pacific West Site, February 14, 2023.

Washington State Department of Ecology (Ecology), 2014, Cleanup Action Plan, Pulp/Tissue Mill Remedial Action Unit, Georgia-Pacific West Site, Bellingham, Washington, Exhibit B to Consent Decree No. 14207008, October 30, 2014.

6 Limitations

Work for this project was performed for the Port of Bellingham (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

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TABLES

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298-A, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Within Acidic Metals Plume																
			GF-MW02	AA-MW04			AA-MW04R												
			07/25/04	09/29/09	03/30/10	02/25/15	10/14/16	11/02/16	01/11/17	04/17/17	07/05/17	01/24/18	04/23/18	07/10/18	10/02/18	01/13/19	04/08/19	07/24/19	10/09/19
Field Parameters																			
pH	pH units	6.2	**3.34**	**4.18**	**4.49**	**4.50**	**4.34**	**4.38**	**4.51**	**4.53**	**4.45**	**4.58**	**4.54**	**5.5**	**6.5**	**5.93**	**5.08**	**6.28**	**5.68**
Temperature	deg C		**18.87**	**15.35**	**11.12**	**11.0**	**15.49**	**15.48**	**8.81**	**11.1**	**15.95**	**10.9**	**12.8**	**15.1**	**15.7**	**12.66**	**10.6**	**16.8**	**15.9**
Specific Conductance	uS/cm		**2442**	**2345**	**1716**	**539**	**2901**	**2123**	**1527**	**1195**	**1096**	**835**	**981**	**1150**	**1088**	**1254**	**1478**	**1149**	**1126**
Dissolved Oxygen	mg/L		**1.55**	**1.23**	**0.38**	**0.51**	**0.12**	**0.14**	**0.15**	**0.26**	**0.13**	**0.4**	**0.3**	**0.1**	**0.11**	**0.14**	**0.22**	**0.61**	**0.19**
ORP	mV		**394**	**-164**	**278**	**75**	**204**	**167**	**136**	**158**	**135**	**83**	**62**	**44**	**-177**	**63**	**145**	**-9**	**68**
Turbidity	NTU		**5**	**10**	**20**	**2**	**22**	**7**	**13**	--	**6**	--	**20**	**35**	**0.02**	**29**	**17**	**15**	**46**
Metals																			
Arsenic (Dissolved)	ug/L	5	**38**	**4.73**	**48**	**5.3**	**83**	**17**	**6.4**	**7.1**	**25**	**14**	3.0 U	**8.1**	**17**	3.0 U	3.0 U	**4.3**	3.0 U
Cadmium (Dissolved)	ug/L	8.8	**81.1**	**1650**	**74.3**	**7.8**	**5000**	**920**	**120**	**49**	**20**	**14**	**9.4**	**47**	4.0 U	**81**	**54**	4.0 U	**120**
Copper (Dissolved)	ug/L	3.1	**795**	**2.78**	**179**	**1.4**	**15000**	**3900**	**1000**	**420**	**240**	**120**	**170**	**130**	**3.8**	**100**	**300**	**18**	**94**
Nickel (Dissolved)	ug/L	8.2	**626**	**1560**	**108**	**19**	**1400**	**320**	**65**	**39**	**42**	**24**	**13**	**83**	4.0 U	**93**	**60**	**18**	**130**
Zinc (Dissolved)	ug/L	81	**2440**	**7420**	**836**	**82**	**10000**	**1800**	**440**	**250**	**330**	**150**	**83**	**330**	25 U	**480**	**470**	**68**	**530**

Analyte	Units	Groundwater Cleanup Level	Wells Within Acidic Metals Plume							
			AA-MW04R (continued)							
			04/21/20	10/07/20	04/29/21	10/20/21	04/27/22	10/26/22	04/11/23	10/25/23
Field Parameters										
pH	pH units	6.2	**6.13**	**6.43**	**6.30**	**5.53**	**6.23**	**6.73**	**6.29**	**6.15**
Temperature	deg C		**11.4**	**16.3**	**12.1**	**16.1**	**11.1**	**15.3**	**11.4**	**15.7**
Specific Conductance	uS/cm		**770**	**838**	**748**	**823**	**1022**	**967**	**689**	**1492**
Dissolved Oxygen	mg/L		**0.93**	**0.28**	**0.23**	**0.11**	--	**0.27**	**0.14**	**0.30**
ORP	mV		**-135**	**-39**	**-202**	**147**	**125**	**-42**	**36**	**-143**
Turbidity	NTU		**12**	**8**	**3**	**4**	**5**	**11**	**6**	**11**
Metals										
Arsenic (Dissolved)	ug/L	5	3.0 U	3.0 U	3.0 U	3.0 U	**5.0**	**4.4**	3.0 U	3.0 U
Cadmium (Dissolved)	ug/L	8.8	4.0 U	4.0 U	4.0 U	**66**	**23**	4.0 U	**6.3**	4.0 U
Copper (Dissolved)	ug/L	3.1	**1.2**	1.0 U	**1.2**	**190**	**110**	**3.0**	**6.2**	**4.5**
Nickel (Dissolved)	ug/L	8.2	**38**	**21**	**24**	**44**	**18**	4.0 U	**17**	**18**
Zinc (Dissolved)	ug/L	81	**66**	**44**	**63**	**230**	**110**	25 U	**46**	**31**

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298-A, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Within Acidic Metals Plume																
			FH-MW01				FH-MW01R												
			07/25/04	09/29/09	03/30/10	02/25/15	10/15/16	01/11/17	04/18/17	07/05/17	01/24/18	04/23/18	07/10/18	10/02/18	01/14/19	04/08/19	07/24/19	10/09/19	04/22/20
Field Parameters																			
pH	pH units	6.2	**4.11**	**4.36**	**4.64**	**5.27**	**4.92**	**5.16**	**5.41**	**5.08**	**5.46**	**5.52**	**5.35**	**5.7**	**5.96**	**5.71**	**5.69**	**5.62**	**5.00**
Temperature	deg C		**20.39**	**16.53**	**11.22**	**11.9**	**16.91**	**9.93**	**12.5**	**19.52**	**11.8**	**12.2**	**16.3**	**17.1**	**10.82**	**11.9**	**16.8**	**16.7**	**11.7**
Specific Conductance	uS/cm		**2305**	**2132**	**1613**	**1877**	**2085.4**	**1527.5**	**1348**	**1458.5**	**1152**	**1563**	**1899**	**2086**	**2291**	**2370**	**2110**	**1879**	**1005**
Dissolved Oxygen	mg/L		**0.73**	**0.82**	**0.45**	**0.80**	**0.1**	**0.16**	**0.33**	**0.35**	**1.4**	**0.3**	**0.1**	**0.17**	**0.34**	**0.38**	**0.29**	**0.17**	**0.80**
ORP	mV		**261**	**-159**	**72**	**122**	**-155**	**44**	**83**	**-114**	**-22**	**-7**	**-57**	**-174**	**32**	**-10**	**-24**	**64**	**32**
Turbidity	NTU		**3.22**	**10**	**10**	**300**	**36.1**	**19.2**	--	**21.2**	--	**39**	**25**	**3.94**	**37**	**40.5**	**34.1**	**11.8**	**17**
Metals																			
Arsenic (Dissolved)	ug/L	5	**2**	**2.72**	0.5 U	3 U	3.0 U	3.0 U	3.0 U	3.0 U	**5.3**	**15**	**88**	**20**	**29**	**35**	**25**	**27**	**46**
Cadmium (Dissolved)	ug/L	8.8	0.2 U	0.02 U	**0.443**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	**5.9**	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Copper (Dissolved)	ug/L	3.1	**0.8**	**1.55**	**1.55**	1 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	1.0 U	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	**405**	**209**	**459**	**190**	**140**	**69**	**59**	**77**	**54**	**6200**	**2700**	**1100**	**2400**	**2500**	**990**	**850**	**590**
Zinc (Dissolved)	ug/L	81	**760**	**616**	**1130**	**530**	**510**	**250**	**180**	**230**	**150**	**950**	**560**	**180**	**810**	**1300**	**940**	**840**	**750**

Analyte	Units	Groundwater Cleanup Level	Wells Within Acidic Metals Plume					
			FH-MW01R (continued)					
			10/07/20	04/29/21	10/20/21	04/27/22	04/11/23	10/25/23
Field Parameters								
pH	pH units	6.2	**Not Monitored**					
Temperature	deg C							
Specific Conductance	uS/cm							
Dissolved Oxygen	mg/L							
ORP	mV							
Turbidity	NTU							
Metals								
Arsenic (Dissolved)	ug/L	5	**Not Monitored**					
Cadmium (Dissolved)	ug/L	8.8						
Copper (Dissolved)	ug/L	3.1						
Nickel (Dissolved)	ug/L	8.2						
Zinc (Dissolved)	ug/L	81						

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298-A, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume														
			AA-MW01			AA-MW01R											
			09/29/09	03/30/10	02/25/15	10/15/16	01/11/17	04/17/17	07/06/17	01/24/18	04/23/18	07/10/18	10/02/18	01/13/19	04/08/19	07/24/19	10/10/19
Field Parameters																	
pH	pH units	6.2	**7.56**	**6.92**	**6.99**	**6.99**	**6.91**	**6.99**	**6.74**	**6.75**	**6.98**	**6.82**	**6.79**	**7.38**	**7.03**	**6.88**	**6.88**
Temperature	deg C		**18.45**	**12.8**	**11.9**	**16.36**	**11.01**	**12.9**	**17.18**	**12.9**	**13.3**	**16.1**	**17.5**	**13.33**	**12.4**	**18.4**	**17.5**
Specific Conductance	uS/cm		**746**	**848**	**1526**	**1503.7**	**1341.3**	**1333**	**1361.2**	**1586**	**1437**	**2720**	**5075**	**2575.2**	**1313**	**5253**	**5139**
Dissolved Oxygen	mg/L		**1.2**	**0.47**	**0.55**	**0.11**	**0.16**	**1**	**0.13**	**0.3**	**0.5**	**0.2**	**0.13**	**0.12**	**0.21**	**0.32**	**4.37**
ORP	mV		**-354**	**-113**	**9**	**-194**	**-33**	**-107**	**-81**	**-85**	**-49**	**-108**	**-210**	**-79**	**-105**	**-85**	**41**
Turbidity	NTU		**10**	**10**	**1.39**	**27.3**	**37.3**	--	**4.54**	--	**14**	**12**	**16.4**	**28.8**	**18.2**	**9.4**	**0.88**
Metals																	
Arsenic (Dissolved)	ug/L	5	**0.11 J**	0.5 U	3 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	**4.5**	**3.8**	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Cadmium (Dissolved)	ug/L	8.8	0.02 U	0.02 U	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Copper (Dissolved)	ug/L	3.1	**0.3**	**0.58**	1 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	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	**0.84**	**1.62**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	**130**	**16**	**11**	4.0 U	4.0 U	4.0 U	4.0 U
Zinc (Dissolved)	ug/L	81	0.5 U	0.5 U	25 U	25 U	25 U	10 U	25 U	25 U	25.0 U	25 U	25 U	25 U	25 U	25 U	25 U

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume	
			AA-MW01R (continued)	
			04/21/20	10/07/20 – 10/25/23
Field Parameters				
pH	pH units	6.2	**7.05**	**Not Monitored**
Temperature	deg C		**12.8**	
Specific Conductance	uS/cm		**1201**	
Dissolved Oxygen	mg/L		**0.60**	
ORP	mV		**-77**	
Turbidity	NTU		**1.6**	
Metals				
Arsenic (Dissolved)	ug/L	5	3.0 U	**Not Monitored**
Cadmium (Dissolved)	ug/L	8.8	4.0 U	
Copper (Dissolved)	ug/L	3.1	1.0 U	
Nickel (Dissolved)	ug/L	8.2	4.0 U	
Zinc (Dissolved)	ug/L	81	25 U	

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298-A, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume															
			AA-MW02			AA-MW02R												
			10/01/09	04/01/10	02/25/15	10/14/16	04/17/17	07/05/17	01/24/18	04/24/18	07/10/18	10/03/18	01/13/19	04/08/19	07/24/19	10/09/19	04/22/20	10/07/20
Field Parameters																		
pH	pH units	6.2	**7.23**	**7.24**	**7.32**	**7.35**	**7.41**	**7.19**	**7.18**	**7.33**	**7.1**	**7.2**	**7.56**	**7.24**	**7.21**	**7.25**	**7.25**	**7.27**
Temperature	deg C		**15.13**	**12.39**	**12.4**	**16.46**	**12.4**	**16.16**	**12.3**	**11.4**	**14.9**	**15.1**	**12.85**	**12**	**16.1**	**14.8**	**11.7**	**15.6**
Specific Conductance	uS/cm		**1337**	**984**	**1110**	**1204.2**	**1018**	**883.6**	**957**	**807**	**812**	**753**	**925.5**	**1041**	**1055**	**886**	**806**	**780**
Dissolved Oxygen	mg/L		**0.58**	**0.72**	**0.54**	**0.09**	**0.25**	**0.23**	**0.3**	**0.1**	**0.1**	**0.2**	**0.12**	**0.21**	**0.37**	**0.18**	**0.63**	**0.14**
ORP	mV		**-335.1**	**-239.1**	**0.3**	**-183.2**	**-41.5**	**-27.6**	**59**	**1**	**-11**	**-30.4**	**-133.1**	**-10**	**-42.9**	**26**	**13**	**-228**
Turbidity	NTU		**10**	**10**	**16.3**	**9.01**	--	**13.2**	--	**5**	**7**	**0.02**	**7.84**	**0.51**	**8.2**	**1.04**	**1.3**	**0.02**
Metals																		
Arsenic (Dissolved)	ug/L	5	**0.1 J**	0.5 U	3 U	--	3.0 U	3.0 U	--	--	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	0.02 U	0.02 U	4 U	--	4.0 U	4.0 U	--	--	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**0.67**	**0.68**	1 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	1.0 U	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	**2.18**	**2.3**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	--	--
Zinc (Dissolved)	ug/L	81	**0.4 J**	**0.6 J**	25 U	--	10 U	25 U	--	--	--	--	--	--	--	--	--	--

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume					
			AA-MW02R (continued)					
			04/28/21	10/20/21	04/27/22	10/26/22	04/11/23	10/25/23
Field Parameters								
pH	pH units	6.2	**7.50**	**7.24**	**7.40**	**7.29**	**7.42**	**7.2**
Temperature	deg C		**12.3**	**15.7**	**11.9**	**15.3**	**12**	**15.3**
Specific Conductance	uS/cm		**696**	**591.1**	**661**	**746**	**596.2**	**1293**
Dissolved Oxygen	mg/L		**0.45**	**0.10**	--	**0.38**	**0.09**	**0.34**
ORP	mV		**68**	**91**	**-288**	**-191**	**-173.8**	**-209.5**
Turbidity	NTU		**2.8**	**0.02**	**2**	**6**	**3.7**	**1.31**
Metals								
Arsenic (Dissolved)	ug/L	5	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	--	--	--	--	--	--
Zinc (Dissolved)	ug/L	81	--	--	--	--	--	--

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298-A, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume															
			AA-MW03			AA-MW03R												
			09/29/09	03/30/10	02/25/15	10/15/16	01/11/17	04/17/17	07/05/17	01/24/18	04/24/18	07/10/18	10/03/18	01/13/19	04/08/19	07/24/19	10/10/19	04/21/20	10/07/20
Field Parameters																			
pH	pH units	6.2	**5.06**	**4.87**	**5.52**	**4.42**	**4.61**	**5.27**	**4.23**	**4.84**	**4.4**	**4.63**	**4.43**	**5.67**	**5.72**	**5.64**	**5.47**	**5.80**	**5.76**
Temperature	deg C		**15.94**	**11.26**	**12.2**	**16.55**	**10.54**	**11.9**	**16.95**	**11.2**	**11**	**16**	**16.9**	**12.9**	**11.5**	**17.4**	**17.5**	**12.2**	**18.1**
Specific Conductance	uS/cm		**1581**	**1661**	**1960**	**1820.5**	**1667.8**	**1820**	**1600.8**	**1431**	**1247**	**1288**	**1350**	**1153**	**901**	**976**	**706**	**813**	**805**
Dissolved Oxygen	mg/L		**0.86**	**0.92**	**0.99**	**0.1**	**0.51**	**1.55**	**0.11**	**0.9**	**0.2**	**0.1**	**0.12**	**0.08**	**0.2**	**0.35**	**0.14**	**0.75**	**0.45**
ORP	mV		**-268**	**69.9**	**119.3**	**-141.2**	**-10.5**	**-33.2**	**12**	**-25**	**-21**	**-49**	**39.4**	**-155**	**-77.2**	**-79.5**	**-4.4**	**-137**	**-30**
Turbidity	NTU		**10**	**10**	**2.55**	**7.12**	--	--	**9.34**	--	**4**	**4**	**0.02**	**8.54**	**11.8**	**11.2**	**2.41**	**1.9**	**0.02**
Metals																			
Arsenic (Dissolved)	ug/L	5	**0.87**	0.5 U	3 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Cadmium (Dissolved)	ug/L	8.8	0.02 U	**0.09**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Copper (Dissolved)	ug/L	3.1	**0.99**	**1.09**	1 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	1.0 U	1.0 U	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	**3.01**	**7.37**	**8.0**	**4.3**	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	**65**	**33**	**27**	**45**	**12**	**6.4**
Zinc (Dissolved)	ug/L	81	**32.3**	**23.6**	25 U	25 U	25 U	10 U	25 U	25 U	25.0 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume					
			AA-MW03R (continued)					
			04/28/21	10/20/21	04/27/22	10/26/22	04/11/23	10/25/23
Field Parameters								
pH	pH units	6.2	**6.06**	**6.35**	**6.10**	**5.55**	**5.73**	**5.76**
Temperature	deg C		**12.6**	**17.7**	**12.2**	**17.6**	**12.0**	**17.3**
Specific Conductance	uS/cm		**1126**	**399.6**	**992**	**523**	**738**	**1097**
Dissolved Oxygen	mg/L		**0.06**	**0.93**	--	**0.18**	**0.07**	**0.12**
ORP	mV		**-39**	**-149.5**	**-267**	**-168**	**-0.4**	**-246**
Turbidity	NTU		**2.9**	**0.02**	**2**	**8**	**3.1**	**1.4**
Metals								
Arsenic (Dissolved)	ug/L	5	3.0 U	--	3.0 U	3.0 U	3.0 U	3.0 U
Cadmium (Dissolved)	ug/L	8.8	4.0 U	--	4.0 U	4.0 U	4.0 U	4.0 U
Copper (Dissolved)	ug/L	3.1	1.0 U	--	**2.4**	1.0 U	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	4.0 U	--	4.0 U	4.0 U	4.0 U	4.0 U
Zinc (Dissolved)	ug/L	81	25 U	--	25 U	25 U	25 U	25 U

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298-A, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume														
			BC-MW05														
			12/19/10	10/15/16	04/17/17	07/06/17	01/24/18	04/25/18	07/10/18	10/02/18	01/13/19	04/08/19	07/23/19	10/09/19	04/21/20	10/07/20	04/28/21	10/20/21
Field Parameters																		
pH	pH units	6.2	**7.64**	**7.25**	**7.4**	**7.2**	**7.2**	**7.42**	**7.21**	**7.26**	**7.54**	**7.25**	**7.17**	**7.12**	**7.22**	**Not Monitored**		
Temperature	deg C		**10.82**	**15.04**	**12.2**	**16.78**	**11.5**	**12.4**	**15**	**16**	**11.37**	**11.2**	**17.2**	**14.9**	**11.4**			
Specific Conductance	uS/cm		**25250**	**9868**	**4674**	**11489**	**5766**	**10857**	**13952**	**31689**	**15228**	**10350**	**11949**	**13024**	**13070**			
Dissolved Oxygen	mg/L		**0.22**	**0.12**	**0.2**	**0.16**	**0.3**	**0.1**	**1.9**	**0.53**	**0.18**	**0.23**	**0.33**	**0.27**	**6.77**			
ORP	mV		**-313**	**-327**	**-298**	**-328**	**-325**	**-207**	**-161**	**-294**	**-305**	**-290**	**-267**	**-187**	**-309**			
Turbidity	NTU		**2.75**	**13.7**	--	**7.72**	--	--	--	**0.02**	**80**	**8.19**	**7.8**	**0.87**	**0.4**			
Metals																		
Arsenic (Dissolved)	ug/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	**Not Monitored**		
Cadmium (Dissolved)	ug/L	8.8	--	--	--	--	--	--	--	--	--	--	--	--	--			
Copper (Dissolved)	ug/L	3.1	--	--	--	--	--	--	--	--	--	--	--	--	--			
Nickel (Dissolved)	ug/L	8.2	--	--	--	--	--	--	--	--	--	--	--	--	--			
Zinc (Dissolved)	ug/L	81	--	--	--	--	--	--	--	--	--	--	--	--	--			

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume			
			BC-MW05 (cont'd)			
			04/27/22	10/26/22	4/11/23	10/25/23
Field Parameters						
pH	pH units	6.2	**Not Monitored**			
Temperature	deg C					
Specific Conductance	uS/cm					
Dissolved Oxygen	mg/L					
ORP	mV					
Turbidity	NTU					
Metals						
Arsenic (Dissolved)	ug/L	5	**Not Monitored**			
Cadmium (Dissolved)	ug/L	8.8				
Copper (Dissolved)	ug/L	3.1				
Nickel (Dissolved)	ug/L	8.2				
Zinc (Dissolved)	ug/L	81				

Table 1. Groundwater Chemistry Data for Acid Plant Subarea

Project No. 140298-A, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume														
			GF-MW01R														
			10/15/16	01/11/17	04/19/17	07/06/17	01/24/18	04/25/18	07/10/18	10/02/18	01/13/19	04/08/19	07/23/19	10/09/19	04/22/20	10/07/20	04/28/21	10/20/21
Field Parameters																		
pH	pH units	6.2	**6.13**	**6.44**	**6.4**	**6.23**	**6.26**	**6.25**	**6.23**	**6.52**	**6.91**	**6.34**	**6.24**	**6.5**	**6.13**	**Not Monitored**		
Temperature	deg C		**16.95**	**10.73**	**12**	**16.42**	**12**	**13.4**	**15.8**	**17.6**	**12.99**	**11.3**	**17.2**	**17.1**	**11.9**			
Specific Conductance	uS/cm		**7059**	**7951**	**3687**	**1125**	**8380**	**1231**	**1764**	**19073**	**3446**	**4901**	**3204**	**2012**	**1464**			
Dissolved Oxygen	mg/L		**0.1**	**0.15**	**0.19**	**0.17**	**0.5**	**0.2**	**0.1**	**0.08**	**0.09**	**0.21**	**0.19**	**0.17**	**1.18**			
ORP	mV		**-220**	**-168**	**-128**	**-14.9**	**-90**	**-61**	**-95**	**-278**	**-254**	**-127**	**-61**	**-68**	**8.5**			
Turbidity	NTU		**6.47**	**9.7**	--	**7.72**	--	--	**5**	**0.02**	**3.17**	--	**8.1**	**3.99**	**1.9**			
Metals																		
Arsenic (Dissolved)	ug/L	5	3.0 U	--	--	--	--	--	--	--	--	--	--	--	3.0 U	Not Monitored		
Cadmium (Dissolved)	ug/L	8.8	4.0 U	--	--	--	--	--	--	--	--	--	--	--	4.0 U			
Copper (Dissolved)	ug/L	3.1	1.0 U	--	1.0 U	--	--	--	--	--	--	--	--	--	1.0 U			
Nickel (Dissolved)	ug/L	8.2	4.0 U	--	4.0 U	--	--	--	--	--	--	--	--	--	4.0 U			
Zinc (Dissolved)	ug/L	81	25 U	--	--	--	--	--	--	--	--	--	--	--	25 U			

Analyte	Units	Groundwater Cleanup Level	Wells Outside of Acidic Metals Plume			
			GF-MW01R (cont'd)			
			04/27/22	10/26/22	04/11/23	10/25/23
Field Parameters						
pH	pH units	6.2	Not Monitored			
Temperature	deg C					
Specific Conductance	uS/cm					
Dissolved Oxygen	mg/L					
ORP	mV					
Turbidity	NTU					
Metals						
Arsenic (Dissolved)	ug/L	5	**Not Monitored**			
Cadmium (Dissolved)	ug/L	8.8				
Copper (Dissolved)	ug/L	3.1				
Nickel (Dissolved)	ug/L	8.2				
Zinc (Dissolved)	ug/L	81				

Notes

Wells AA-MW01R, BC-MW05, FH-MW01R, and GF-MW01R not monitored because they were within the Harcourt construction zone.

U - Not detected at PQL. Yellow - exceeded cleanup level. "--" indicates analysis not conducted.

deg C - degrees Celsius, ug/L - micrograms per liter, uS/cm -microsiemens per centimeter, mg/L - milligrams per liter, mV - millivolts, NTU - Nephelometric Turbidity Unit

Table 2. Groundwater Chemistry Data for Miscellaneous Metals Area

Project No. 140298-A, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Within Miscellaneous Metals Area											
			LP-MW01											
			07/27/04	09/30/09	03/29/10	02/26/15	10/14/16	01/11/17	04/17/17	07/06/17	01/23/18	04/23/18	07/10/18	10/03/18
Field Parameters														
pH	pH units	6.2	**7.20**	**7.09**	**7.79**	**6.94**	**6.71**	**7.04**	**7.23**	**6.88**	**6.85**	**6.56**	**6.50**	**6.59**
Temperature	deg C		**19.14**	**19.1**	**11.39**	**10.8**	**16.11**	**7.6**	**11.2**	**18.79**	**9.1**	**11.7**	**18**	**16.9**
Specific Conductance	uS/cm		**863**	**712**	**222**	**193.3**	**277.5**	**237.2**	**509.8**	**430.2**	**317**	**164**	**590**	**670**
Dissolved Oxygen	mg/L		**0.73**	**0.99**	**3.14**	**0.60**	**7.46**	**1.79**	**0.21**	**0.16**	**0.4**	**1.2**	**0.1**	**3.21**
ORP	mV		**-27**	**-289**	**98**	**-179**	**77**	**30**	**-96**	**-193**	**121**	**-50**	**-111**	**77**
Turbidity	NTU		**17**	**10**	**10**	**4**	**3**	**1**	--	**5**	**10**	**9**	**7**	**0.02**
Metals														
Arsenic (Dissolved)	ug/L	5	**14.1**	**3.18**	**1.1 J**	--	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	**1.5**	**0.097**	**0.061**	--	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**45**	**3.10**	**4.41**	**3.5**	**4.1**	**4.5**	**11**	**11**	**6.5**	**4.4**	**10**	**9.1**
Nickel (Dissolved)	ug/L	8.2	**7**	**1.61**	**1.2**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	--	**4.1**	--
Zinc (Dissolved)	ug/L	81	**10**	**0.56**	0.5 U	--	--	--	--	--	--	--	--	--

Analyte	Units	Groundwater Cleanup Level	Wells Within Miscellaneous Metals Area											
			LP-MW01 (continued)											
			01/14/19	04/09/19	07/24/19	10/08/19	04/20/20	10/07/20	04/29/21	10/21/21	04/28/22	10/26/22	04/11/23	10/25/23
Field Parameters														
pH	pH units	6.2	**7.13**	**6.26**	**6.47**	**6.40**	**6.09**	**6.59**	**6.57**	**6.35**	**6.63**	**6.56**	**6.66**	**6.27**
Temperature	deg C		**10.39**	**11.1**	**17.6**	**14.9**	**12.3**	**16.7**	**12.8**	**14.9**	**11.2**	**16.2**	**10.01**	**13.9**
Specific Conductance	uS/cm		**166**	**265**	**563.6**	**273.4**	**190**	**385**	**243**	**284.5**	**239.8**	**1618**	**201.9**	**1000**
Dissolved Oxygen	mg/L		**2.5**	**0.92**	**0.22**	**0.23**	**0.64**	**0.38**	**0.13**	**1.01**	--	**2.25**	**0.09**	**3.39**
ORP	mV		**-3**	**84**	**86**	**15**	**-121**	**140**	**60**	**-48**	**-241**	**-18**	**43.6**	**89.3**
Turbidity	NTU		**5**	**0.1**	**7**	**2**	**1**	**1**	**6**	**0.02**	**1**	**12**	**1.42**	**2.55**
Metals														
Arsenic (Dissolved)	ug/L	5	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	--	--	--	--	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**3.9**	**4.2**	**7.4**	**9.1**	**3.1**	**8.8**	**2.1**	**9.4**	**4.0**	**25**	**5.8**	**15**
Nickel (Dissolved)	ug/L	8.2	--	--	--	--	--	--	--	--	--	--	--	--
Zinc (Dissolved)	ug/L	81	--	--	--	--	--	--	--	--	--	--	--	--

Table 2. Groundwater Chemistry Data for Miscellaneous Metals Area

Project No. 140298-A, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Within Miscellaneous Metals Area										
			SC-MW02				SC-MW02R						
			07/27/04	09/30/09	04/01/10	02/26/15	10/14/16	04/17/17	07/05/17	01/23/18	04/23/18	07/10/18	10/02/18
Field Parameters													
pH	pH units	6.2	**6.05**	**6.41**	**6.56**	**6.78**	**6.89**	**6.94**	**6.34**	**6.7**	**6.69**	**6.51**	**6.71**
Temperature	deg C		**15.28**	**16.58**	**10.89**	**11.3**	**16.51**	**11.6**	**17.38**	**11.1**	**11.1**	**16.1**	**15.3**
Specific Conductance	uS/cm		**6685**	**4137**	**2920**	**3325**	**1765.5**	**1726**	**1855.5**	**1389**	**1024**	**2557**	**4233**
Dissolved Oxygen	mg/L		**0.68**	**0.65**	**4.58**	**0.58**	**0.12**	**0.1**	**0.1**	**0.6**	--	**0.1**	**0.06**
ORP	mV		**-385**	**-497**	**-272**	**-194**	**-303**	**-178**	**-269**	**-62**	**-92**	**-215**	**230**
Turbidity	NTU		**56**	**10**	**15**	**9**	**28**	--	--	--	**12**	**38**	**0**
Metals													
Arsenic (Dissolved)	ug/L	5	**12.2**	**2.94**	1.67 U	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	0.5 U	**0.043**	0.067 U	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**17**	**4.78**	**0.412**	2 U	**4.4**	**3.1**	**4.1**	**3.7**	**4.1**	**16**	**7.3**
Nickel (Dissolved)	ug/L	8.2	**29**	**8.42**	1.67 U	**13**	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	**17**	**28**
Zinc (Dissolved)	ug/L	81	**20**	**4.13**	1.67 U	--	--	--	--	--	--	--	--

Analyte	Units	Groundwater Cleanup Level	Wells Within Miscellaneous Metals Area											
			SC-MW02R (continued)											
			01/14/19	04/09/19	07/24/19	10/08/19	04/20/20	10/07/20	04/29/21	10/21/21	04/28/22	10/26/22	04/11/23	10/25/23
Field Parameters														
pH	pH units	6.2	**7.12**	**6.37**	**6.55**	**6.56**	**6.33**	**6.73**	**6.87**	**6.55**	**7.03**	**6.92**	**7.06**	**6.56**
Temperature	deg C		**9.53**	**10.3**	**15.7**	**14.6**	**12.1**	**16.0**	**12.2**	**15.9**	**11.4**	**15.2**	**10.16**	**15.4**
Specific Conductance	uS/cm		**1187**	**1587**	**2267**	**1053**	**1577**	**2799**	**2083**	**1067**	**1564**	**3771**	**786.95**	**2738**
Dissolved Oxygen	mg/L		**0.15**	**0.79**	**0.11**	**0.47**	**0.47**	**0.16**	**0.16**	**0.11**	**0.17**	**-324**	**0.13**	**0.16**
ORP	mV		**-216**	**-116**	**-341**	**-44**	**-154**	**-300**	**-286**	**-209**		**-353**	**-106.8**	**-310**
Turbidity	NTU		**18**	**42**	**38**	**8**	**70**	**9**	**17**	**6**	**11**	**13**	**14.5**	**132**
Metals														
Arsenic (Dissolved)	ug/L	5	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	--	--	--	--	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**14**	**4.8**	**7.4**	**5.1**	**2.9**	**3.3**	**2.8**	**2.4**	**2.5**	**6.6**	1.0 U	**2.1**
Nickel (Dissolved)	ug/L	8.2	4.0 U	4.0 U	**6.2**	4.0 U	--	--	--	--	--	--	--	--
Zinc (Dissolved)	ug/L	81	--	--	--	--	--	--	--	--	--	--	--	--

Table 2. Groundwater Chemistry Data for Miscellaneous Metals Area

Project No. 140298-A, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Downgradient of Miscellaneous Metals Area													
			AA-MW02			AA-MW02R										
			10/01/09	04/01/10	02/25/15	10/14/16	04/17/17	07/05/17	01/24/18	04/24/18	07/10/18	10/03/18	01/13/19	04/08/19	07/24/19	10/09/19
Field Parameters																
pH	pH units	6.2	**7.23**	**7.24**	**7.32**	**7.35**	**7.41**	**7.19**	**7.18**	**7.33**	**7.1**	**7.2**	**7.56**	**7.24**	**7.21**	**7.25**
Temperature	deg C		**15.13**	**12.39**	**12.4**	**16.46**	**12.4**	**16.16**	**12.3**	**11.4**	**14.9**	**15.1**	**12.85**	**12**	**16.1**	**14.8**
Specific Conductance	uS/cm		**1337**	**984**	**1110**	**1204.2**	**1018**	**883.6**	**957**	**807**	**812**	**753**	**925.5**	**1041**	**1055**	**886**
Dissolved Oxygen	mg/L		**0.58**	**0.72**	**0.54**	**0.09**	**0.25**	**0.23**	**0.3**	**0.1**	**0.1**	**0.2**	**0.12**	**0.21**	**0.37**	**0.18**
ORP	mV		**-335**	**-239**	**0**	**-183**	**-42**	**-28**	**59**	**1**	**-11**	**-30**	**-133**	**-10**	**-43**	**26**
Turbidity	NTU		**10**	**10**	**16**	**9**	**--**	**13**	**--**	**5**	**7**	**0.02**	**8**	**1**	**8**	**1**
Metals																
Arsenic (Dissolved)	ug/L	5	**0.1 J**	0.5 U	3 U	--	3.0 U	3.0 U	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	0.02 U	0.02 U	4 U	--	4.0 U	4.0 U	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**0.67**	**0.68**	1 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	1.0 U
Nickel (Dissolved)	ug/L	8.2	**2.18**	**2.3**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Zinc (Dissolved)	ug/L	81	**0.4 J**	**0.6 J**	25 U	--	10 U	25 U	--	--	--	--	--	--	--	--

Analyte	Units	Groundwater Cleanup Level	Wells Downgradient of Miscellaneous Metals Area							
			AA-MW02R (continued)							
			04/22/20	10/07/20	04/28/21	10/20/21	04/28/22	10/26/22	04/11/23	10/25/23
Field Parameters										
pH	pH units	6.2	**7.25**	**7.27**	**7.50**	**7.24**	**7.40**	**7.29**	**7.42**	**7.2**
Temperature	deg C		**11.7**	**15.6**	**12.3**	**15.7**	**11.9**	**15.3**	**12**	**15.3**
Specific Conductance	uS/cm		**806**	**780**	**696**	**591.1**	**661**	**746**	**596.2**	**1293**
Dissolved Oxygen	mg/L		**0.63**	**0.14**	**0.45**	**0.10**	**--**	**0.38**	**0.09**	**0.34**
ORP	mV		**13**	**-228**	**68**	**91**	**-288**	**-191**	**-173.8**	**-209.5**
Turbidity	NTU		**1**	**0.02**	**3**	**0.02**	**2**	**6**	**3.7**	**1.31**
Metals										
Arsenic (Dissolved)	ug/L	5	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Nickel (Dissolved)	ug/L	8.2	--	--	**--**	**--**	**--**	**--**	**--**	**--**
Zinc (Dissolved)	ug/L	81	--	--	**--**	**--**	**--**	**--**	**--**	**--**

Table 2. Groundwater Chemistry Data for Miscellaneous Metals Area

Project No. 140298-A, Georgia-Pacific West Site, Bellingham, Washington

Analyte	Units	Groundwater Cleanup Level	Wells Downgradient of Miscellaneous Metals Area															
			LB-MW01				LB-MW01R											
			07/27/04	10/01/09	04/01/10	02/26/15	10/14/16	01/11/17	04/19/17	07/05/17	01/24/18	04/23/18	07/10/18	10/02/18	01/13/19	04/09/19	07/24/19	10/09/19
Field Parameters																		
pH	pH units	6.2	**6.60**	**6.79**	**6.84**	**6.70**	**6.93**	**7**	**7.23**	**7.04**	**6.95**	**7.19**	**7.39**	**7.74**	**7.45**	**7.64**	**7.62**	**7.45**
Temperature	deg C		**20.00**	**18.3**	**11.38**	**11.3**	**16.09**	**10.93**	**11**	**16.33**	**10.7**	**12.3**	**15.1**	**15.3**	**11.1**	**10.8**	**15**	**14.7**
Specific Conductance	uS/cm		**858**	**1001**	**702**	**607**	**1008**	**723.3**	**540.1**	**478.9**	**589**	**376**	**1001**	**1489**	**634.9**	**1364**	**1361**	**1197**
Dissolved Oxygen	mg/L		**0.86**	**0.61**	**0.95**	**0.53**	**0.15**	**0.22**	**0.15**	**0.06**	**0.3**	**0.1**	**0.1**	**0.01**	**0.13**	**0.22**	**0.08**	**0.12**
ORP	mV		**-295**	**-379**	**-251**	**57**	**-207**	**-44**	**-18**	**-51**	**47**	**-43**	**-33**	**-299**	**-170**	**-146**	**-66**	**-18**
Turbidity	NTU		**6**	**10**	**10**	**4**	**19**	**11**	--	**2**	--	**5**	**8**	--	**2**	**0.1**	**9**	**2**
Metals																		
Arsenic (Dissolved)	ug/L	5	0.5 U	0.5 U	0.5 U	3 U	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	0.5 U	0.02 U	0.02 U	4 U	--	--	--	--	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	1 U	**1.4**	**0.79**	**8.7**	**5.9**	**2.0**	**2.0**	**11.0**	**6.7**	**6.0**	**5.4**	**4.1**	**3.4**	**5.7**	**7.1**	**3.7**
Nickel (Dissolved)	ug/L	8.2	1 U	**0.86**	**2**	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Zinc (Dissolved)	ug/L	81	10 U	**0.72**	**0.6 J**	25 U	--	--	--	--	--	--	--	--	--	--	--	--

Analyte	Units	Groundwater Cleanup Level	Wells Downgradient of Miscellaneous Metals Area							
			LB-MW01R (continued)							
			04/21/20	10/07/20	04/28/21	10/20/21	04/28/22	10/26/22	04/11/23	10/25/23
Field Parameters										
pH	pH units	6.2	**7.44**	**7.66**	**8.24**	**7.10**	**7.75**	**8.39**	**7.22**	**7.38**
Temperature	deg C		**11.4**	**15.5**	**12.3**	**15.4**	**11.3**	**14.8**	**11.23**	**14.9**
Specific Conductance	uS/cm		**626**	**1122**	**995**	**760**	**471.5**	**905**	**624.38**	**1981**
Dissolved Oxygen	mg/L		**1.17**	**0.18**	**0.11**	**1.96**		**0.11**	**0.34**	**0.11**
ORP	mV		**-188**	**-95**	**-273**	**-146**	**-147**	**-250**	**17.7**	**-267.3**
Turbidity	NTU		**3**	**2**	**3**	**0.02**	**2**	**7**	**0.79**	**1.96**
Metals										
Arsenic (Dissolved)	ug/L	5	--	--	--	--	--	--	--	--
Cadmium (Dissolved)	ug/L	8.8	--	--	--	--	--	--	--	--
Copper (Dissolved)	ug/L	3.1	**5.5**	**5.6**	**7.4**	**1.7**	**1.9**	**5.2**	**4.3**	**10**
Nickel (Dissolved)	ug/L	8.2	--	--	--	--	--	--	--	--
Zinc (Dissolved)	ug/L	81	--	--	--	--	--	--	--	--

Notes

Wells AA-MW02R and SC-MW02R not monitored 1/11/17 due to iced-in monuments.

U - Not detected at PQL. Yellow - exceeded cleanup level. "--" indicates analysis not conducted.

deg C - degrees Celsius, ug/L - micrograms per liter, uS/cm -microsiemens per centimeter, mg/L - milligrams per liter, mV - millivolts, NTU - Nephelometric Turbidity Unit

Table 3. Wells and Analytes for 2024 Groundwater Monitoring

Project No. 140298-A, Georgia-Pacific West Site, Bellingham, Washington

Well ID	Field Parameters	Dissolved Metals				
		Arsenic	Cadmium	Copper	Nickel	Zinc
AA-MW01R2	X	X	X	X	X	X
AA-MW04R	X		X	X	X	X
FH-MW01R2	X	X	X	X	X	X
LB-MW01R	X			X		
LP-MW01	X			X		
SC-MW02R	X			X		
AA-MW02R	X	X if pH <6.2	X if pH <6.2	X	X if pH <6.2	X if pH<6.2
AA-MW03R	X	X for As, Cd, Cu, Ni, Zn if pH <6.2				
BC-MW05	X					
GF-MW01R	X					

Notes

If pH < 6.2 in AA-MW02R, AA-MW03R, BC-MW05R, or GF-MW01R, analyze that well for full suite of dissolved metals (As, Cd, Cu, Ni, Zn). However, AA-MW02R is analyzed for Cu and Ni each event regardless of pH (refer to text).

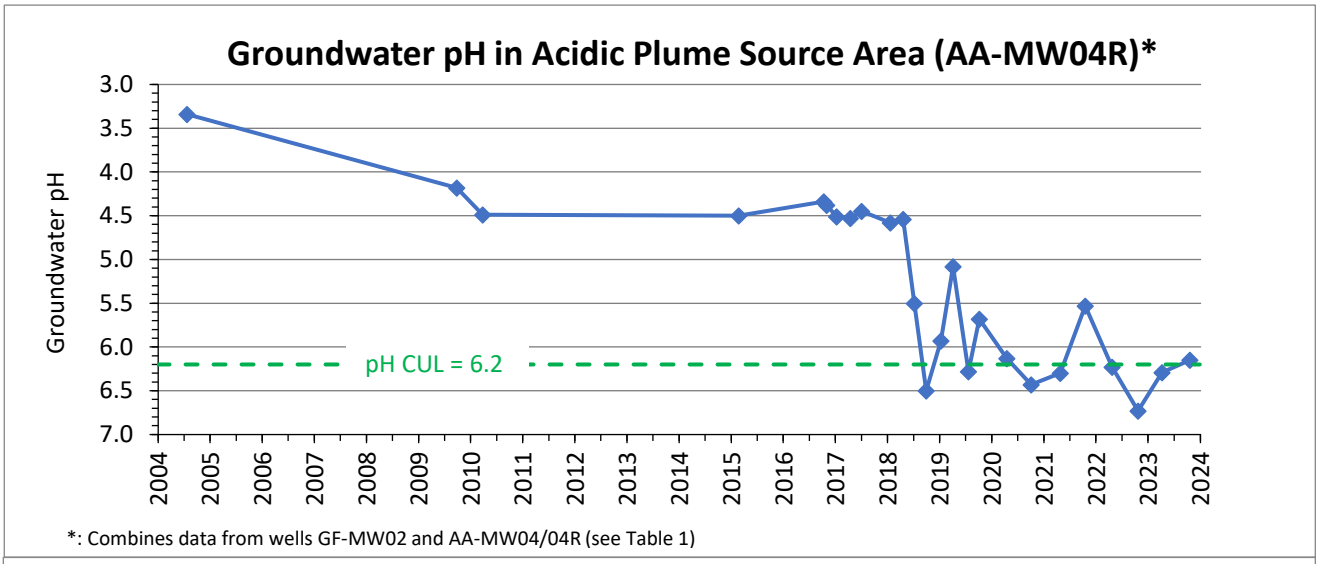
FIGURES

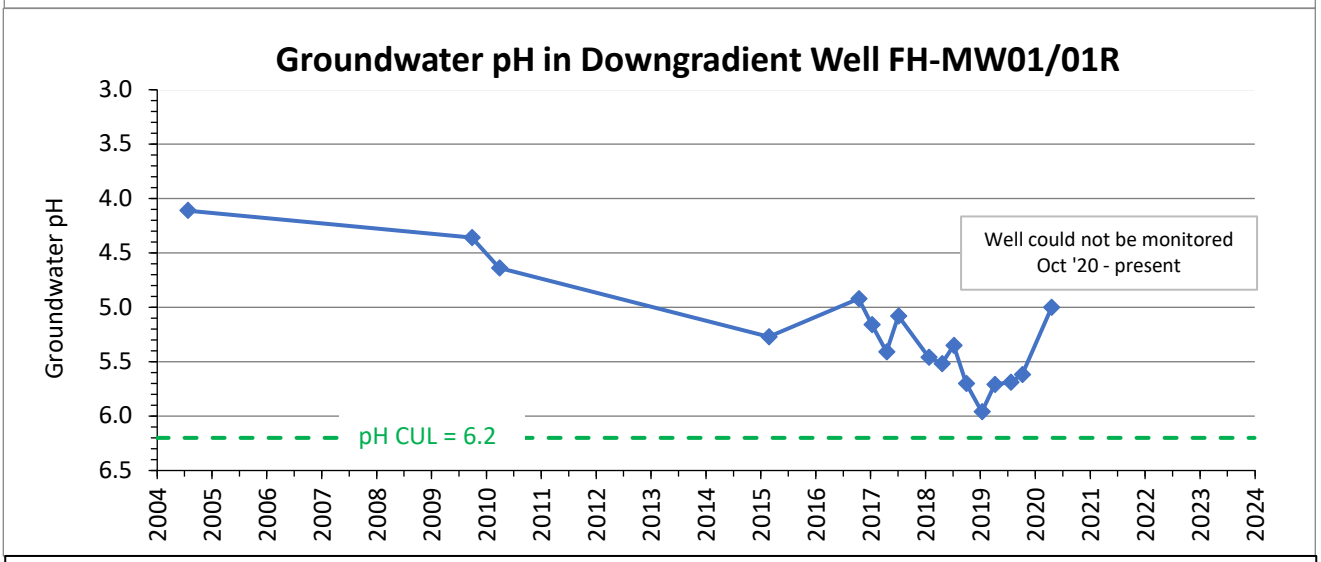
Monitoring Well Locations

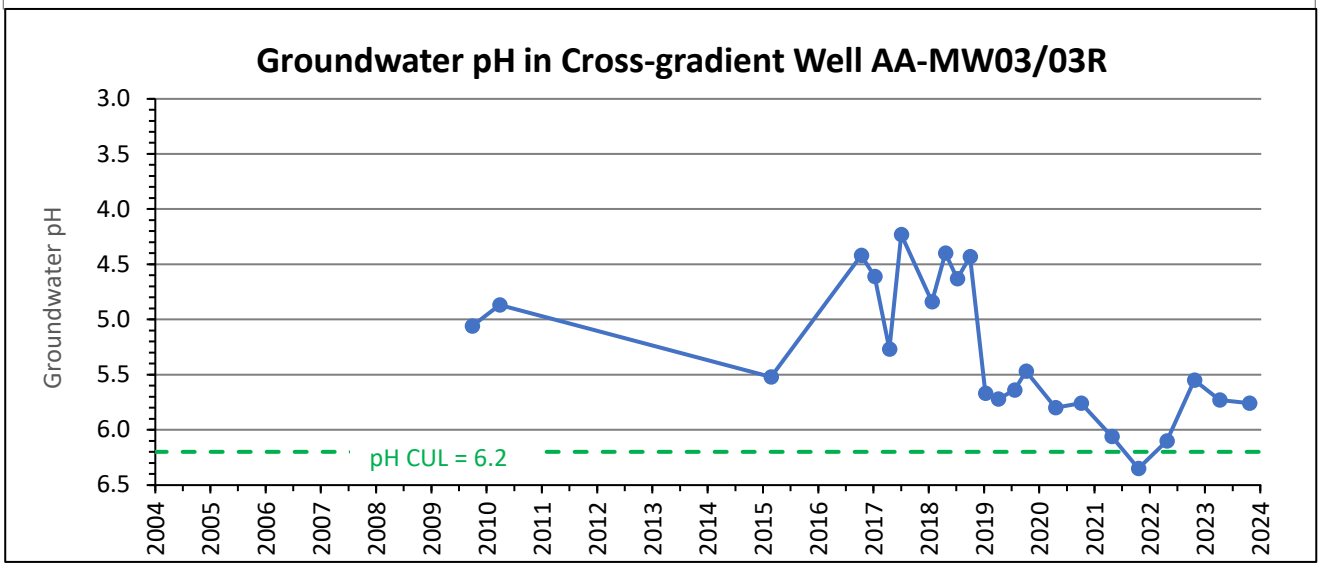
Annual Report for Groundwater MNA Program
Pulp/Tissue Mill RAU
GP West Site, Bellingham, WA

Aspect Consulting	DEC-2023	BY: SJG / NLK	FIGURE NO. 1
	PROJECT NO. 140298	REVISED BY: ---/---	

Data source credits: None || Basemap Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA







Note: Groundwater pH axis is plotted in reverse order so higher on axis is farther from pH 6.2 CUL.

Figure 2

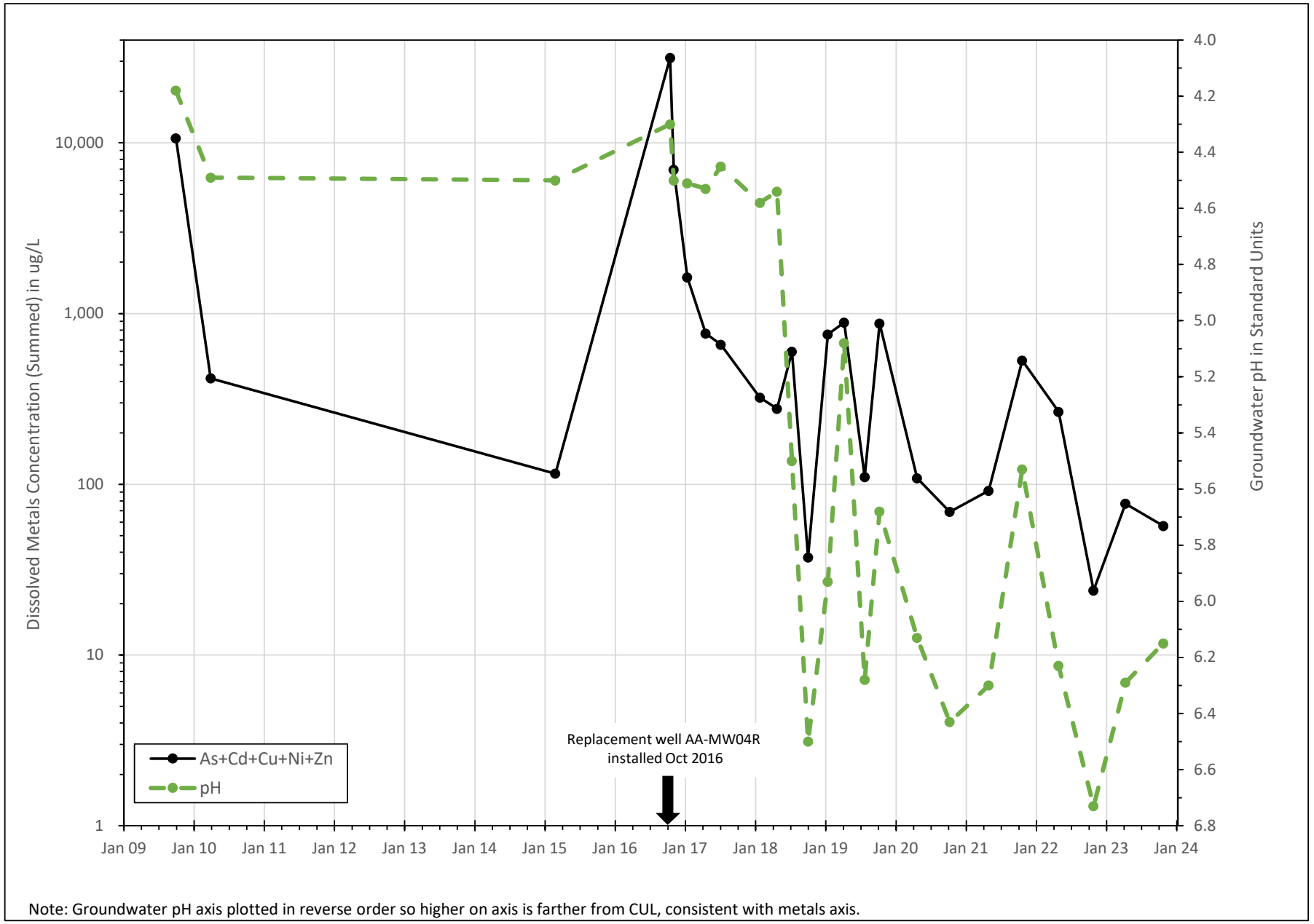
Acidic Plume Groundwater pH Trends Over Time, 2004-2023

2023 Groundwater MNA Annual Report
Project No. 140298

Aspect Consulting

2/26/2024

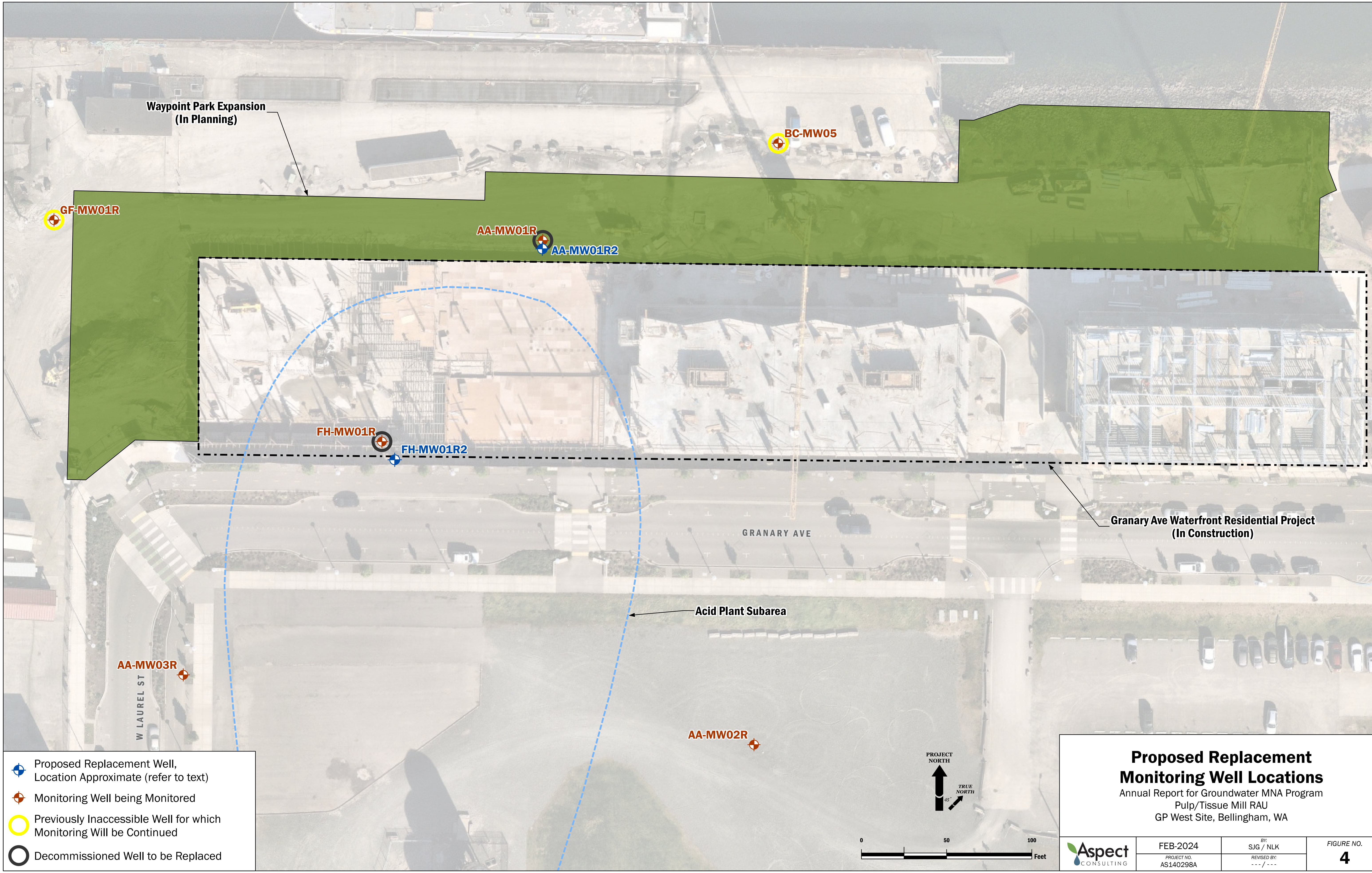
V:\140298 POB GP West Pulp & Tissue RAU Cleanup\Deliverables\2023 GW MNA Report\Tables Figures Appendices\Figure 2 - Acid plume pH Trend Plot long term



Note: Groundwater pH axis plotted in reverse order so higher on axis is farther from CUL, consistent with metals axis.

Figure 3

Metals Concentration and pH Trends Over Time for Well AA-MW04/04R



Proposed Replacement Monitoring Well Locations

Annual Report for Groundwater MNA Program
Pulp/Tissue Mill RAU
GP West Site, Bellingham, WA

Aspect CONSULTING

FEB-2024	BY: SJG / NLK	FIGURE NO.
PROJECT NO. AS140298A	REVISED BY: --- / ---	4

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APPENDIX A

Data Validation Report and Laboratory Reports from OnSite Environmental

DATA VALIDATION REPORT

Pulp/Tissue Mill RAU of GP West Site
2023 Groundwater Monitored Natural Attenuation Sampling
Sample Delivery Groups 2304-130 and 2311-002

Prepared by:
Aspect Consulting, LLC
710 2nd Ave, Suite 550
Seattle, WA 98104

Project No. 140298A-19 • November 20, 2023

This report summarizes the findings of a U.S. Environmental Protection Agency (EPA) Stage 2A data validation performed on analytical data groundwater samples collected in April 2023 and October 2023 for the GP West Pulp and Tissue Mill Remedial Action Unit groundwater monitoring program.

Samples were analyzed for select metals by EPA method 200.8 by Onsite Environmental, Inc. in Redmond, Washington (Onsite). Refer to the table below for further information.

Table 1. Analytical Methods

Analysis	Method	Laboratory
Metals (Arsenic, Copper, Cadmium, Nickel, Zinc)	EPA 200.8	OnSite

The validation followed the procedures documented in the analytical methods, and the *National Functional Guidelines for Organic Data Review* (USEPA, 2017), and *Contract Laboratory Program SOW* (USEPA, 2016).

Data assigned a J qualifier (estimated) may be used for site evaluation purposes but the reasons for qualification should be considered when interpreting sample concentrations. Data marked as rejected (R) should not be used under any circumstances. Values without qualification meet all data measurement quality objectives and are suitable for use.

No data were qualified in the course of this review; all quality control (QC) requirements were met.

Water samples in this sample delivery group (SDG), and the chemical analyses performed on them, are tabulated below. The sections below describe the results of the data quality review.

Table 2. Sample Index

Sample Name	Sample Date	Sample Matrix	Dissolved Copper	Dissolved Arsenic, Cadmium, Nickel and Zinc
AA-MW02R-20230411	2023-04-11 13:40:00	Water	X	
AA-MW03R-20230411	2023-04-11 15:40:00	Water	X	
AA-MW04R-20230411	2023-04-11 14:55:00	Water	X	
LB-MW01R-20230411	2023-04-11 12:55:00	Water	X	
LP-MW01-20230411	2023-04-11 14:22:00	Water	X	X
SC-MW02R-20230411	2023-04-11 11:10:00	Water	X	X

Sample receipt and preservation (2-6 degrees C) were acceptable. Samples were analyzed within the requisite holding time limit.

Target analytes were not detected at or above the reporting levels in the method blank. No qualification or action was needed.

All laboratory control sample (LCS) percent recoveries (%R) were within the laboratory specified control limits for requested analytes. No qualification or action was needed.

All laboratory duplicate sample relative percent differences (RPDs) were within the laboratory specified control limits for all target analytes. No qualification or action was needed.

All matrix spike (MS) and MS duplicate sample %Rs and RPDs were within the laboratory specified control limits for all target analytes. No qualification or actions were needed.

Accuracy was acceptable based on the LCS and MS/MSD %Rs and precision was acceptable based on the laboratory duplicate and MS/MSD RPD values. The data are of known quality and are acceptable for use.

Water samples in this sample delivery group (SDG), and the chemical analyses performed on them, are tabulated below. The sections below describe the results of the data quality review.

Table 3. Sample Index

Sample Name	Sample Date	Sample Matrix	Dissolved Copper	Dissolved Arsenic, Cadmium, Nickel and Zinc
AA-MW02R-20231025	2023-10-25 14:05:00	Water	X	
AA-MW03R-20231025	2023-10-25 15:10:00	Water	X	X
AA-MW04R-20231025	2023-10-25 16:25:00	Water	X	X
LB-MW01R-20231023	2023-10-23 17:00:00	Water	X	
LP-MW01-20231026	2023-10-26 11:35:00	Water	X	
SC-MW02R-20231025	2023-10-25 12:45:00	Water	X	

Sample receipt and preservation (2-6 degrees C) were acceptable. Samples were analyzed within the requisite holding time limit.

Target analytes were not detected at or above the reporting levels in the method blank. No qualification or action was needed.

All laboratory control sample (LCS) percent recoveries (%R) were within the laboratory specified control limits for requested analytes. No qualification or action was needed.

All laboratory duplicate sample relative percent differences (RPDs) were within the laboratory specified control limits for all target analytes. No qualification or action was needed.

All matrix spike (MS) and MS duplicate sample %Rs and RPDs were within the laboratory specified control limits for all target analytes. No qualification or actions were needed.

Accuracy was acceptable based on the LCS and MS/MSD %Rs and precision was acceptable based on the laboratory duplicate and MS/MSD RPD values. The data are of known quality and are acceptable for use.

No sample results were qualified in the course of the Stage 2A validation performed.

Data Qualifier	Definition
J	The analyte was detected above the reported quantitation limit, and the reported concentration was an estimated value.
R	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
U	The analyte was analyzed for but was considered not detected at the reporting limit or reported value.
UJ	The analyte was analyzed for, and the associated quantitation limit was an estimated value.

U.S. Environmental Protection Agency (USEPA), 2017 National Functional Guidelines for Organic Methods Data Review, Office of Superfund Remediation and Technology Innovation (OSRTI), USEPA Publication No. 540-R-2017-002, January.

U.S. Environmental Protection Agency (USEPA), 2016, Contract Laboratory Program (CLP) Statement of Work (SOW) for Organic Superfund Methods, Multi-Media, Multi-Concentration, SOM02.4, October.

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

April 21, 2023

Steve Germiat
Aspect Consulting
Dexter Horton Building
710 2nd Avenue, Suite 550
Seattle, WA 98104

Re: Analytical Data for Project 140298
Laboratory Reference No. 2304-130

Dear Steve:

Enclosed are the analytical results and associated quality control data for samples submitted on April 12, 2023.

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

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

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: April 21, 2023
Samples Submitted: April 12, 2023
Laboratory Reference: 2304-130
Project: 140298

Case Narrative

Samples were collected on April 11, 2023 and received by the laboratory on April 12, 2023. They were maintained at the laboratory at a temperature of 2°C to 6°C.

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

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

Date of Report: April 21, 2023
Samples Submitted: April 12, 2023
Laboratory Reference: 2304-130
Project: 140298

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**SC-MW02-20230411**					
Laboratory ID:	04-130-01					
Copper	**ND**	1.0	EPA 200.8		4-20-23	
Client ID:	**LB-MW01R-20230411**					
Laboratory ID:	04-130-02					
Copper	**4.3**	1.0	EPA 200.8		4-20-23	
Client ID:	**AA-MW02R-20230411**					
Laboratory ID:	04-130-03					
Copper	**ND**	1.0	EPA 200.8		4-20-23	
Client ID:	**LP-MW01-20230411**					
Laboratory ID:	04-130-04					
Copper	**5.8**	1.0	EPA 200.8		4-20-23	
Client ID:	**AA-MW04R-20230411**					
Laboratory ID:	04-130-05					
Arsenic	**ND**	3.0	EPA 200.8		4-20-23	
Cadmium	**6.3**	4.0	EPA 200.8		4-20-23	
Copper	**6.2**	1.0	EPA 200.8		4-20-23	
Nickel	**17**	4.0	EPA 200.8		4-20-23	
Zinc	**46**	25	EPA 200.8		4-20-23	
Client ID:	**AA-MW03R-20230411**					
Laboratory ID:	04-130-06					
Arsenic	**ND**	3.0	EPA 200.8		4-20-23	
Cadmium	**ND**	4.0	EPA 200.8		4-20-23	
Copper	**ND**	1.0	EPA 200.8		4-20-23	
Nickel	**ND**	4.0	EPA 200.8		4-20-23	
Zinc	**ND**	25	EPA 200.8		4-20-23	

Date of Report: April 21, 2023
Samples Submitted: April 12, 2023
Laboratory Reference: 2304-130
Project: 140298

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0420D1					
Arsenic	**ND**	3.0	EPA 200.8		4-20-23	
Cadmium	**ND**	4.0	EPA 200.8		4-20-23	
Copper	**ND**	1.0	EPA 200.8		4-20-23	
Nickel	**ND**	4.0	EPA 200.8		4-20-23	
Zinc	**ND**	25	EPA 200.8		4-20-23	

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	04-130-06									
	ORIG	DUP								
Arsenic	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Cadmium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Copper	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Nickel	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA	NA	NA	20	
MATRIX SPIKES										
Laboratory ID:	04-130-06									
	MS	MSD	MS	MSD		MS	MSD			
Arsenic	**83.6**	**82.4**	80.0	80.0	ND	**105**	**103**	75-125	1	20
Cadmium	**77.2**	**74.8**	80.0	80.0	ND	**97**	**94**	75-125	3	20
Copper	**74.4**	**74.2**	80.0	80.0	ND	**93**	**93**	75-125	0	20
Nickel	**78.4**	**78.2**	80.0	80.0	ND	**98**	**98**	75-125	0	20
Zinc	**82.0**	**80.0**	80.0	80.0	ND	**103**	**100**	75-125	2	20
SPIKE BLANK										
Laboratory ID:	SB0420D1									
Arsenic	**81.6**		80.0		N/A	**102**	85-115			
Cadmium	**76.6**		80.0		N/A	**96**	85-115			
Copper	**77.2**		80.0		N/A	**97**	85-115			
Nickel	**75.6**		80.0		N/A	**95**	85-115			
Zinc	**78.4**		80.0		N/A	**98**	85-115			

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

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

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

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

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

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

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

I - Compound recovery is outside of the control limits.

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

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

L - The RPD is outside of the control limits.

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

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

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

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

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

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

Q - Surrogate recovery is outside of the control limits.

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

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

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

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

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

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

X - Sample extract treated with a mercury cleanup procedure.

X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

X2 - Sample extract treated with a silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Z -

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

Chain of Custody

Page 1 of 1

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

Company: Aspect Consulting
Project Number: 140298
Project Name: GP West PTM
Project Manager: Steve Germiat/Delia Massey
Sampled by: NTC/BW

Turnaround Request (in working days)

(Check One)

- ☐ Same Day ☐ 1 Day
- ☐ 2 Days ☐ 3 Days
- ☒ Standard (7 Days) (TPH analysis 5 Days)
- ☐ _____ (other)

Laboratory Number: 04-130

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx	Volatiles 8260B	Halogenated Volatiles 8260B	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082	Organochlorine Pesticides 8081A	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA / MTCA Metals (circle one)	TCLP Metals	HEM (oil and grease) 1664	Dissolved Cu	Dissolved As	Dissolved Cd	Dissolved Ni	Dissolved Zn		% Moisture
1	SC-MW02-20230411	04/11/23	1110	W	1																X						
2	LB-MW01R-20230411		1255																		X	~~X~~	~~X~~	~~X~~	~~X~~	NTC	
3	AA-MW02R-20230411		1340																		X						
4	LP-MW01-20230411		1422																		X						
5	AA-MW04R-20230411		1455																		X	X	X	X	X		
6	AA-MW03R-20230411	↓	1540	↓	↓																X	X	X	X	X		

	Signature	Company	Date	Time
Relinquished	[signature]	Aspect	04/12/23	0905
Received	Nichelle Shaw	OSE	4/12/23	0905
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Chromatograms with final report ☐

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

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

November 10, 2023

Amy Tice
Aspect Consulting
Dexter Horton Building
710 2nd Avenue, Suite 550
Seattle, WA 98104

Re: Analytical Data for Project 140298
Laboratory Reference No. 2311-002

Dear Amy:

Enclosed are the analytical results and associated quality control data for samples submitted on November 1, 2023.

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

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

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: November 10, 2023
Samples Submitted: November 1, 2023
Laboratory Reference: 2311-002
Project: 140298

Case Narrative

Samples were collected on October 23, 25 and 26, 2023 and received by the laboratory on November 1, 2023. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below. However the soil results for the QA/QC samples are reported on a wet-weight basis.

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

Date of Report: November 10, 2023
Samples Submitted: November 1, 2023
Laboratory Reference: 2311-002
Project: 140298

DISSOLVED METALS
EPA 200.8

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LP-MW01-20231026**					
Laboratory ID:	11-002-01					
Copper	**15**	1.0	EPA 200.8		11-7-23	
Client ID:	**SC-MW02R-20231025**					
Laboratory ID:	11-002-02					
Copper	**2.1**	1.0	EPA 200.8		11-7-23	
Client ID:	**LB-MW01R-20231023**					
Laboratory ID:	11-002-03					
Copper	**10**	1.0	EPA 200.8		11-7-23	
Client ID:	**AA-MW02R-20231025**					
Laboratory ID:	11-002-04					
Copper	**ND**	1.0	EPA 200.8		11-7-23	
Client ID:	**AA-MW03R-20231025**					
Laboratory ID:	11-002-05					
Arsenic	**ND**	3.0	EPA 200.8		11-7-23	
Cadmium	**ND**	4.0	EPA 200.8		11-7-23	
Copper	**ND**	1.0	EPA 200.8		11-7-23	
Nickel	**ND**	4.0	EPA 200.8		11-7-23	
Zinc	**ND**	25	EPA 200.8		11-7-23	
Client ID:	**AA-MW04R-20231025**					
Laboratory ID:	11-002-06					
Arsenic	**ND**	3.0	EPA 200.8		11-7-23	
Cadmium	**ND**	4.0	EPA 200.8		11-7-23	
Copper	**4.5**	1.0	EPA 200.8		11-7-23	
Nickel	**18**	4.0	EPA 200.8		11-7-23	
Zinc	**31**	25	EPA 200.8		11-7-23	

Date of Report: November 10, 2023
Samples Submitted: November 1, 2023
Laboratory Reference: 2311-002
Project: 140298

DISSOLVED METALS
EPA 200.8
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1107D1					
Arsenic	**ND**	3.0	EPA 200.8		11-7-23	
Cadmium	**ND**	4.0	EPA 200.8		11-7-23	
Copper	**ND**	1.0	EPA 200.8		11-7-23	
Nickel	**ND**	4.0	EPA 200.8		11-7-23	
Zinc	**ND**	25	EPA 200.8		11-7-23	

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	11-002-05									
	ORIG	DUP								
Arsenic	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Cadmium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Copper	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Nickel	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Zinc	**ND**	**ND**	NA	NA		NA	NA	NA	20	
MATRIX SPIKES										
Laboratory ID:	11-002-05									
	MS	MSD	MS	MSD		MS	MSD			
Arsenic	**87.6**	**90.0**	80.0	80.0	ND	**110**	**113**	75-125	3	20
Cadmium	**82.6**	**83.4**	80.0	80.0	ND	**103**	**104**	75-125	1	20
Copper	**74.2**	**75.0**	80.0	80.0	ND	**93**	**94**	75-125	1	20
Nickel	**77.4**	**80.2**	80.0	80.0	ND	**97**	**100**	75-125	4	20
Zinc	**84.8**	**85.8**	80.0	80.0	ND	**106**	**107**	75-125	1	20

SPIKE BLANK						
Laboratory ID:	SB1107D1					
Arsenic	**76.6**	80.0	N/A	**96**	85-115	
Cadmium	**78.8**	80.0	N/A	**99**	85-115	
Copper	**76.0**	80.0	N/A	**95**	85-115	
Nickel	**76.4**	80.0	N/A	**96**	85-115	
Zinc	**77.0**	80.0	N/A	**96**	85-115	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

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

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

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

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

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

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

I - Compound recovery is outside of the control limits.

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

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

L - The RPD is outside of the control limits.

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

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

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

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

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

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

Q - Surrogate recovery is outside of the control limits.

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

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

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

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

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

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

X - Sample extract treated with a mercury cleanup procedure.

X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

X2 - Sample extract treated with a silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Z -

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

Chain of Custody

Page 1 of 1

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

Company: Aspect
Project Number: 140298
Project Name: Pulp Mill GW
Project Manager: Amy Tee
Sampled by: B. Ward

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Days
- ☐ 3 Days
- ☒ Standard (7 Days)
- ☐ _____ (other)

Laboratory Number: 11-002

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX (8021☐ 8260☐)	NWTPH-Gx	NWTPH-Dx (SG Clean-up ☐)	Volatiles 8260	Halogenated Volatiles 8260	EDB EPA 8011 (Waters Only)	Semivolatiles 8270/SIM (with low-level PAHs)	PAHs 8270/SIM (low-level)	PCBs 8082	Organochlorine Pesticides 8081	Organophosphorus Pesticides 8270/SIM	Chlorinated Acid Herbicides 8151	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664	Dissolved Cu	Dissolved As, Cd, Cu, Ni, Zn			% Moisture
1	LP-MW01-20231026	10/26	1135	Water	1																		X				
2	SC-MW02R-20231025	10/25	1245		1																		X				
3	LB-MW01R-20231023	10/23	1700		1																		X				
4	AA-MW02R-20231025	10/25	1405		1																		X				
5	AA-MW03R-20231025	10/25	1510		1																			X			
6	AA-MW04R-20231025	10/25	1625		1																			X			

	Signature	Company	Date	Time
Relinquished		Aspect	10/30	1600
Received			11/1/23	1015
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐