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October 25, 2022

Joe Hunt, L.HG.
VCP Project Manager / Hydrogeologist
Washington State Department of Ecology
P.O. Box 4775
Olympia, WA 98504-7775

Subject: Addressing Ecology's RI Data Gaps
Hardel Mutual Plywood Corporation Site
1210 West Bay Drive NW, Olympia, Washington
VCP ID SW1757, Formerly Agreed Order DE 4108, Cleanup Site ID No. 3704, Facility/Site ID No. 75128579

Dear Mr. Hunt:

On behalf of The Milestone Companies (Milestone) and Coastline Law Group (Coastline), PIONEER Technologies Corporation (PIONEER) is submitting the following documents for your VCP review:

- Attachment 1: Responses to Nick Acklam's January 11, 2022 Verbal Comments on the August 2021 RI Data Gap Report
- Attachment 2: Work Plan to Address Ecology's RI Data Gaps
- Attachment 3: Request for Opinion Form

A few notes for you:

- Thanks again for providing timely feedback on the methane soil gas sampling last month. We followed your guidance, which was helpful for delineating the elevated methane concentrations.
- All data collected since PIONEER's investigation activities started in 2020 have been uploaded to Ecology's Environmental Information Management database, except for the September 2022 methane results.
- We would like to have a meeting with you before you issue a formal VCP opinion letter.

If you have any questions or comments about the enclosed materials, please do not hesitate to contact me at (360) 570-1700 x105.

Respectfully,

Troy Bussey, Jr., P.E. (WA, CA, NC, SC, GA), L.G. (WA, CA, NC, SC), L.HG. (WA)
Principal Engineer

Enclosures:
Attachment 1: Responses to Nick Acklam's January 11, 2022 Verbal Comments on the August 2021 RI Data Gap Report
Attachment 2: Work Plan to Address Ecology's RI Data Gaps
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Attachment 1

Memo

PIONEER TECHNOLOGIES CORPORATION
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To: Joe Hunt, L.HG. (Ecology)

From: Troy Bussey Jr., P.E., L.G., L.HG. (PIONEER)

Cc: Brandon Smith (Milestone), Kim Seely (Coastline), Heather Burgess (Phillips Burgess)

Date: October 25, 2022

Subject: Responses to Nick Acklam's January 11, 2022 Verbal Comments on the August 2021 RI Data Gap Report
Hardel Mutual Plywood Corporation Site
1210 West Bay Drive NW, Olympia, Washington
VCP ID SW1757, Formerly Agreed Order DE 4108, Cleanup Site ID No. 3704, Facility/Site ID No. 75128579

On behalf of The Milestone Companies (Milestone) and Coastline Law Group (Coastline), PIONEER Technologies Corporation (PIONEER) is submitting the enclosed responses to Washington State Department of Ecology (Ecology) comments on the August 2021 Remedial Investigation (RI) Data Gap Report for the Hardel Mutual Plywood Corporation Site (Site). The responses are presented in Table 1. Supporting data and information discussed in Table 1 are presented in Table 2, Figures 1 through 4, Charts 1 through 7, and Appendix A.

PIONEER submitted the RI Data Gap Report, Voluntary Cleanup Program (VCP) application, and VCP agreement form to Ecology on August 31, 2021. Nick Acklam (the Ecology VCP Site Manager at the time) responded with a VCP application acceptance letter on September 30, 2021. Kim Seely (Coastline) and I had a VCP technical consultation meeting with Nick Acklam on January 11, 2022 to discuss Nick's review of the August 2021 RI Data Gap Report.

If you have any questions or comment about the enclosed responses or supporting material, please do not hesitate to contact me at (360) 570-1700 x105.

Enclosures

Table 1	Responses to Nick Acklam's January 11, 2022 Verbal Comments on the August 2021 RI Data Gap Report
Table 2	Existing Sediment and Soil Results for Dioxins/Furans, PCP, PCBs, and cPAHs On or Near the Hardel Mutual Plywood Corporation Site
Figure 1	Total Dioxins/Furans Sediment and Soil Results
Figure 2	Pentachlorophenol Sediment and Soil Results
Figure 3	Total PCBs Sediment and Soil Results
Figure 4	Total cPAHs Sediment and Soil Results
Chart 1	Groundwater Sampling Times Relative to Tidal Stage for 3Q20 (August 31, 2020)
Chart 2	Groundwater Sampling Times Relative to Tidal Stage for 4Q20 (November 24, 2020)
Chart 3	Groundwater Sampling Times Relative to Tidal Stage for 1Q21 (January 14, 2021)
Chart 4	Groundwater Sampling Times Relative to Tidal Stage for 2Q21 (May 5, 2021)
Chart 5	Groundwater Sampling Times Relative to Tidal Stage for 3Q21 (August 13, 2021)
Chart 6	Groundwater Sampling Times Relative to Tidal Stage for 4Q21 (November 16, 2021)
Chart 7	Groundwater Sampling Times Relative to Tidal Stage for 1Q22 (February 1, 2022)
Appendix A	Photographic Log

Tables

Table 1: Responses to Nick Acklam's January 11, 2022 Verbal Comments on the August 2021 RI Data Gap Report

#	Ecology Comment (or PIONEER Comment for #10, #16-#18)	Response
For the purpose of this table, the terms "Site" and "Hardel Site" refer to the upland portion of the former Hardel property.		
1	Nick mentioned that he (1) did a high-level review of the August 2021 Remedial Investigation (RI) Data Gap Report (Report) for the Site, (2) discussed current Site conditions with Rebecca Lawson (Ecology), and (3) had Connie Groven (Ecology) review the Report from a sediment perspective. Nick also mentioned that most of his comments were hypothetical questions rather than specific concerns.	Comment noted.
2	Nick said, in general, he agrees with the conclusion that the Site is minimally contaminated.	Comment noted.
3	Nick said he agrees the probable recommended cleanup alternative outlined in Section 5.2 of the Report makes sense for this Site.	Comment noted.
4	Nick said he had few questions and minimal concerns about the Report and the data gap investigation activities completed to date.	Comment noted.
5	Nick asked if any samples were analyzed for extractable petroleum hydrocarbons (EPH) and/or volatile petroleum hydrocarbons (VPH), and wondered if site-specific total petroleum hydrocarbon (TPH) soil direct contact screening levels should be calculated using site-specific EPH or VPH results.	Troy responded that a few site-specific EPH analyses were performed early in the data gap investigation process and explained why default TPH soil direct contact screening levels were used in the Report. In summary, two representative soil samples and three representative groundwater samples collected in 2020 were analyzed for EPH. No samples were analyzed for VPH since the TPH in the gasoline range (TPH-G) concentrations in the few 2020 soil and groundwater samples that had a TPH-G detection were relatively low. Site-specific TPH in the diesel range (TPH-D) and TPH in the heavy oil range (TPH-HO) soil direct contact screening levels (based on the site-specific EPH results) were not used in the Report because the site-specific results were similar to default results, and it was assumed that using default results would simplify the Report and Ecology's review of the Report. To clarify future reporting, site-specific TPH-D and TPH-HO soil direct contact screening levels will be calculated for the two site-specific EPH soil results using the latest Model Toxics Control Act (MTCA) TPH 11.1 Excel Workbook (which includes recently updated noncancer reference doses for TPH fractions) and utilized in future reports (e.g., Focused Feasibility Study [FS] Report). Updated TPH-D and TPH-HO soil direct contact screening levels will not affect the probable recommended cleanup alternative outlined in Section 5.2 of the Report.
6	Nick recommended that stormwater outfall locations be shown on some figures in a future report.	Troy responded that stormwater outfall locations would be shown on some figures in a future report. The approximate locations of the three former Hardel stormwater outfalls and the two current City of Olympia (City) stormwater outfalls are shown on Figures 1 through 4. These outfall locations will also be shown on figures in future reports (e.g., Focused FS Report).
7	Nick mentioned that groundwater samples should ideally be collected during several different tidal conditions, including during low tide.	Troy responded that groundwater samples were collected at several different tidal conditions, including during low tide. The time each monitoring well (MW) was sampled during the August 2020, November 2020, January 2021, May 2021, August 2021, November 2021, and February 2022 groundwater monitoring (GWM) events are shown on Charts 1 through 7 relative to the associated tidal conditions. As shown on Charts 1 and 3, samples were collected in August 2020 and January 2021 on a falling tide, with several samples collected at or near low tide. As shown on Charts 6 and 7, samples were collected in November 2021 and February 2022 at or near low tide. As shown on Charts 2, 4, and 5, samples were collected in November 2020, May 2021, and August 2021 on a rising tide, with at least one sample collected near high tide in each event. It should be noted that a tidal lag study was conducted as part of the RI completed under the 2007 Agreed Order. In the 2007 RI Report, Greylock Consulting concluded that although there is some tidal influence at the Site, "no groundwater flow direction reversal was observed" and "groundwater flow direction and gradient is strongly influenced by groundwater movement from the bluffs west of the Site."
8	Nick asked if samples had been analyzed for metals (e.g., the eight Resource Conservation and Recovery Act metals) and semi-volatile organic compounds (SVOCs) beyond polycyclic aromatic hydrocarbons (PAHs).	Troy answered affirmatively explaining that samples had been collected for metals and non-PAH SVOCs as summarized in Table 2 of the Report. For instance, soil, groundwater, and sediment samples were analyzed for non-PAH SVOCs, and soil and sediment samples were analyzed for metals prior to the determination of constituents of concern (COCs) in the 2009 FS report prepared pursuant to the 2007 Agreed Order. Based on the Ecology-approved screening of the analytical results, non-PAH SVOCs and metals were not determined to be COCs under the 2007 Agreed Order. During the Agreed Order phase, TPH-D, TPH-HO, and PAHs were determined to be the only Site COCs. During the 2020 Phase II Environmental Site Assessment, PIONEER analyzed additional soil and groundwater samples for metals and non-PAH SVOCs. There were no screening level exceedances for metals or non-PAH SVOCs in these 2020 soil and groundwater samples, except for slight arsenic exceedances in several groundwater samples and a slight silver soil-to-groundwater exceedance in one soil sample. As a result, arsenic and silver were retained as constituents of interest for subsequent GWM events, while the other metals and non-PAH SVOCs were not included as analytes in subsequent sampling events. Nick responded that the completed analyses and screening process verbally described by Troy sounded acceptable.
9	Nick asked if silica gel cleanup was used prior to any TPH analyses and/or if silica gel cleanup TPH results were included in the Report.	Troy explained that silica gel cleanup was not used prior to any of the TPH analyses, and therefore no silica gel cleanup TPH results were included in the Report.
10	Troy asked if Nick thought Ecology's new weathered diesel screening level of 2,100 ug/L for protection of aquatic receptors in marine water could be incorporated into future evaluations, reports, and decision-making (e.g., use of this screening level as a groundwater remediation level).	Nick agreed that this new screening level could be incorporated into future evaluations, reports, and decision-making.

Table 1: Responses to Nick Acklam's January 11, 2022 Verbal Comments on the August 2021 RI Data Gap Report

#	Ecology Comment (or PIONEER Comment for #10, #16-#18)	Response
11	Nick indicated a potential concern about how to address the slight tetrachloroethylene exceedance in the B5 groundwater sample adjacent to the Reliable Steel property and the slight ethylene dibromide and arsenic exceedances in the B6 groundwater sample adjacent to the Reliable Steel property. Although Nick indicated it made sense these slight exceedances were due to groundwater transport from the Reliable Steel property, Nick said he was "leaning" towards installing and sampling one or more MWs to provide more proof.	Installation and sampling of two new MWs (one MW near these slight groundwater exceedances on the Reliable Steel property boundary and one MW near the shoreline) are proposed to address this comment. See proposed investigation activities in the Work Plan to Address Ecology's RI Data Gaps (Attachment 2).
12	Nick said Connie Groven had reviewed previous Budd Inlet sediment reports, which indicated a hog fuel burner (HFB) was formerly at the Site. Nick said he wanted to ensure there was sufficient soil sampling and analysis for chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans (dioxins/furans) in case there was ash located on the Site near the former boiler.	To address this comment, additional soil samples will be collected from within the footprints of the three ash-related historical operations at the Site (i.e., Boiler House, Boiler Ash Accumulation Area, and Baghouse) and analyzed for dioxins/furans as a confirmation measure. See the Work Plan to Address Ecology's RI Data Gaps (Attachment 2). However, as discussed in detail below, existing evidence already indicates Hardel boiler ash and elevated dioxins/furans concentrations are not concerns for this Site. Specifically, (1) the boiler fuel was most likely not salt-laden, (2) any burning of salt-laden wood waste was de minimus, (3) ash is not present in Site soil, and (4) the dioxins/furans soil concentrations at the Site are extremely low. **<u>Boiler Fuel Most Likely Not Salt-Laden</u>**: Although Hardel operated a boiler at the Site, existing evidence indicates the boiler most likely did not burn salt-laden wood waste. Former HFBs that burned salt-laden wood waste are one of many potential historical and current sources of dioxins/furans in Budd Inlet sediment. HFBs and other industrial emission sources that produced dioxins/furans were formerly located along the Budd Inlet shoreline (see Photos #1 through #8 in Appendix A for examples). The Hardel boiler was presumably operated from the time the plant started in circa 1947 (McIntosh 2010) through 1996. Recent Budd Inlet dioxins/furans documents (e.g., Anchor QEA 2016, NewFields 2016, Ecology 2018) concluded this boiler was an HFB and implied it burned salt-laden wood based on limited research and unsupported assumptions. The source of the Hardel HFB claim in these recent Budd Inlet dioxins/furans documents was Section 6.4.4.2 of Anchor QEA 2016, which purportedly relied upon information in the 2007 Site RI Report (Greylock 2007). However, the 2007 Site RI Report does not mention the presence of a former HFB, a former wood waste burner, or any burning of salt-laden wood. Rather, the 2007 Site RI Report mentions that Hardel "stored, handled, and used green veneer" and its "process created boiler ash waste which was recycled." The following information obtained from additional research further supports statements in the 2007 Site RI Report and indicates the Hardel boiler most likely did not burn any salt-laden wood waste: • When the plant started in 1947, "Hardel Plywood made sheeting veneer out of four-foot lengths of logs since they only had a four-foot lathe" (McIntosh 2010). In other words, Hardel was initially a small operation that used short log sections, which were likely purchased from other sawmills based on the following bullet. • "When the company became a cooperative [in 1953], they stopped buying logs and then only purchased veneer from local manufacturers that they remanufactured into plywood" (McIntosh 2010). This "green veneer was brought onsite either by rail or by boat" (TetraTech 1999). • Although extensive log rafting historically occurred within Budd Inlet and these logs were "taken in rafts to local mills and also Shelton, Tacoma, Seattle and Everett" (McIntosh 2010), it is unlikely any of those salt-laden logs were used or burned during Hardel operations because of the use of short logs that were purchased from others during 1947 through 1953 and the purchasing of pre-processed veneer after 1953. • Butane was used as the fuel source for the boiler starting in circa 1953-1958 (see Photos #9 and #10 in Appendix A; Washington State Historical Society 2022). The "fuel house" immediately south of the boiler house in the 1968 Sanborn map (see Photo #12 in Appendix A) most likely referred to the butane storage tank. Butane was not used as the boiler fuel source in the 1980s through 1996 (TetraTech 1999), and the end of butane as the boiler fuel source was likely circa 1977-1980 when other changes to the facility were made (based on a review of aerial photographs). • In the 1980s through 1996, scrap wood and baghouse fines were burned in the boiler (TetraTech 1999). The overwhelming majority of scrap wood generated in the 1980s through 1996 would most likely have been scraps of raw veneer purchased from local manufacturers. **<u>Any Burning of Salt-Laden Wood Waste Was De Minimus</u>**: If some salt-laden wood waste was burned in the former Hardel boiler at some point between 1947 and circa 1977-1980,[1] the following evidence suggests the amount of salt-laden wood burned in the boiler was de minimus compared to the amounts burned in other HFBs along Budd Inlet (see also Response to Comment #13): • The predominant wood waste stream was scraps of raw veneer purchased from local manufacturers (McIntosh 2010; TetraTech 1999). • Since Hardel purchased veneer (i.e., wood that already been cut into thin layers) from local manufacturers from 1953 to 1996 (rather than cutting logs to create the veneer), the amount of wood waste generated would have been substantially less than a mill that cut logs into plywood or veneer. • Butane (not wood) was the fuel source for the boiler from circa 1953-1958 through likely circa 1977–1980. • The quantity of visible air emissions from the two small Hardel smokestacks were substantially less than emissions from HFBs and other smokestacks in inner Budd Inlet. For instance, the quantity of air emissions from the Hardel smokestacks in Photos #4, #6, #8, and #11 were substantially smaller than the emissions from HFBs and other smokestacks in Photos #1 through #8 (see Appendix A). **<u>Ash is Not Present in Site Soil</u>**: Ash has not been observed in Site soil, which counters Ecology's erroneous and unsupported text on Page 13 of its 2018 South Puget Sound Regional Background report that "hog fuel boiler ash is still present in soils" (Ecology 2018). Although ash was generated by the Hardel boiler, the ash was reused as a feedstock in the manufacturing process since at least the 1980s through 1996 (TetraTech 1999, Greylock 2007). In addition, it appears that boiler ash was likely drummed and temporarily stored on the Boiler Ash Accumulation Area prior to its reuse as a feedstock (TetraTech 1999). Based on a comprehensive review of all 92 existing Site boring logs, ash has not been encountered or observed in any soil boring. The wide spatial distribution of these soil borings (see Figures 1 through 4) and the complete lack of ash in any boring indicates that ash has not been identified in Site soil. Notably, ash was not encountered in soil borings located within or proximate to the footprints of the three ash-related historical operations: the Boiler House, the Boiler Ash Accumulation Area, and the Baghouse (see Figures 1 through 4). The proposed additional soil borings are expected to conclusively confirm that boiler ash is not present in Site soil. **<u>Extremely Low Dioxins/Furans Soil Concentrations</u>**: The total dioxins/furans concentrations in the seven Site soil samples are extremely low, with concentrations ranging from 0.53 ng/kg at B107 to 5.0 ng/kg at B105 (i.e., an average of the 2.8 ng/kg and 7.1 ng/kg duplicate results). The maximum dioxins/furans soil concentration of 5.0 ng/kg is less than (1) Ecology's natural background dioxins/furans soil concentration of 5.2 ng/kg (Ecology 2010), (2) the most stringent soil screening level for unrestricted land use of 13 ng/kg (PIONEER 2021), (3) Ecology's regional background sediment concentration of 19 ng/kg (Ecology 2018), and (4) the dioxins/furans concentrations in the eight sediment samples collected immediately east of the Site (see Figure 1). In other words, there is no evidence of a dioxins/furans release at the Site.

[1] The possibility that some salt-laden wood waste might have been burned in the boiler is based solely on the presence of a logway on the northeastern end of Hardel operations (see Photos #6, #11, and #12 in Appendix A). This logway may have been installed for pre-1953 operations (before Hardel bought raw veneer from local manufacturers) or it may have been used for some ancillary non-manufacturing purpose. Based on a review of aerial photographs, the logway was removed when the current shoreline armoring was installed circa 1977-1980.

Table 1: Responses to Nick Acklam's January 11, 2022 Verbal Comments on the August 2021 RI Data Gap Report

#	Ecology Comment (or PIONEER Comment for #10, #16-#18)	Response
13	Per Nick, Connie Groven mentioned that sediment investigations and evaluations for elevated dioxins/furans concentrations in Budd Inlet (e.g., NewFields 2016, Anchor QEA 2016, Ecology 2018) have occurred after Ecology issued its Agreed Order satisfaction letter for the Site in 2012. The concern is that there might be elevated dioxins/furans sediment concentrations near the Site.	To evaluate this comment, PIONEER obtained and tabulated total dioxins/furans concentrations for all existing sediment samples collected near the Site and soil samples collected on the Site using a consistent and conservative compound totaling methodology (see Table 2).[2] In addition, PIONEER obtained and tabulated pentachlorophenol (PCP) and total polychlorinated biphenyls (PCBs) concentrations for all existing sediment samples near the Site and soil samples collected on the Site (see Table 1) since Ecology's consultant (NewFields) concluded in their chemometric evaluation that historical use of PCP and historical use of PCBs "at and around the Port Peninsula" were two of the three congener profile factors that characterize almost all of the upland sources for dioxins/furans in Budd Inlet sediment (NewFields 2016). The other key congener profile factor identified in NewField's chemometric evaluation was "correlated to HFB emissions and ash" (NewFields 2016). As discussed in Response to Comment #12, the existing evidence indicates salt-laden wood waste was most likely not burned in the former Hardel boiler and ash has not been observed in any of the 92 Site soil boring logs. The total dioxins/furans, PCP, and total PCBs concentrations in sediment samples near the Site and soil samples on the Site are shown on Figures 1 through 3, respectively. Although total dioxins/furans sediment concentrations exceeding Ecology's regional background concentration of 19 ng/kg are present throughout inner Budd Inlet, recent reports (Anchor QEA 2016, NewFields 2016) repeatedly emphasized the presence of the 2007 BI-S7 sediment sample with an "elevated" dioxins/furans concentration (60 ng/kg) in the context of former Hardel boiler operations. The repeated mistaken inferences about the former Hardel boiler in these 2016 reports as well as Ecology's erroneous 2018 text that "hog fuel boiler ash is still present in soils" (see Response to Comment #12) presumably predicated this 2022 comment regarding the elevated 60 ng/kg dioxins/furans sediment concentration in the 2007 BI-S7 sample. However, Ecology already considered the dioxins/furans concentrations in BI-S7, BI-S6, and the four 2007 RI sediment samples (GS-01 through GS-04; Greylock 2007) in its decision-making for its Agreed Order remedy and its 2012 No Further Action determination for the Site. With these six 2007 sediment results and other evidence in hand, Ecology definitively determined that the Site was not a source for elevated dioxins/furans sediment concentrations near the Hardel Site. For instance, in the 2012 Cleanup Action Plan (CAP) for the Site (Ecology 2012), Ecology concluded: • "There have been no documented uses of this Site that would have produced phthalates or dioxins/furans." • "These dioxins/furans are believed to originate from an offsite source and are not known to have originated from historic operations on the uplands of this Site." • "Dioxins/furans in sediments of Budd Inlet are believed to come from several upland sources including the former Cascade Pole facility." • "Dioxins/furans were determined to not be COCs at this Site." • "As part of this cleanup action plan, cleanup of dioxins/furans and phthalates in the sediment is not required." Contrary to the concern raised in this comment, the new information obtained from sampling, evaluation, and research activities since Ecology's 2012 No Further Action determination reinforces Ecology's 2012 CAP conclusions regarding the lack of a relationship between the Hardel Site and West Bay dioxins/furans sediment concentrations. For instance: • The total dioxins/furans concentrations in the two 2013 sediment samples collected east of the Site (i.e., POBI-SS-26, POBI-SS-27) were similar to or less than the six pre-2012 dioxins/furans sediment concentrations Ecology considered when it issued the 2012 CAP (see Figure 1). • The total dioxins/furans concentrations in all eight sediment samples immediately east of the Site were less than the Cascade Pole sediment cleanup level of 80 ng/kg (Anchor QEA 2016), and two orders of magnitude less than the maximum pre-remediation Cascade Pole sediment concentration of 1,100 ng/kg prior to the 2001 removal of 35,000 cubic yards of contaminated sediments (Landau 1993; Ecology 2009).[3] • PCP-related data support Ecology's CAP conclusions that Cascade Pole wood treatment facility is most likely a primary source for dioxins/furans in sediment east of the Site. The congener profile for the PCP factor, which is a match of "PCP profiles from wood treatment and the historical sediment samples from Cascade Pole," was "present throughout the inlet" at "more elevated concentrations" than the congener profiles for the HFB emissions/ash and PCB factors (NewFields 2016). More specifically, the congener profile for the PCP factor was responsible for 48% to 63% of the dioxins/furans sediment concentrations closest to the Site (NewFields 2016).[4] Further, PCP was detected in the four sediment samples located closest to Cascade Pole (i.e., Hard-1, Hard-2, POBI-SS-26, POBI-SS-27) and there were elevated laboratory reporting limits for the other four sediment samples (GS-01 through GS-04). By contrast, there was no known use of PCP at the Site (TetraTech 1999; PIONEER 2020),[5] and PCP was not detected in any on-site soil samples (see Figure 2). • Historical use of PCBs "at and around the Port Peninsula" is a key indicator for the source of dioxins/furans according to NewFields 2016. PCBs were not detected in any on-site soil samples or in the four sediment samples (GS-01 through GS-04) located closest to the Site (see Figure 3). The only detection of PCBs in the sediment east of the Site was in the BI-S7 sample, which also had the highest dioxins/furans concentration near the Site (60 ng/kg). • 2022 research findings indicate the boiler most likely did not burn salt-laden wood waste (see Response to Comment #12). • A 2022 evaluation of the 92 Site boring logs demonstrated that ash has not been observed in Site soil (see Response to Comment #12). • The total dioxins/furans concentrations in the seven Site soil samples collected in 2020 are extremely low and less than the natural background dioxins/furans soil concentration (see Response to Comment #12). The primary source for the elevated dioxins/furans sediment concentrations near the Hardel Site is most likely historical releases from Cascade Pole based on the following lines of evidence: • "Historical discharges of PCP [from Cascade Pole] may have been responsible for some of the elevated dioxin/furan concentrations currently observed <u>throughout</u> Budd Inlet" (NewFields 2016; emphasis added). • "There is no clear break point defining where the primary influence of Cascade Pole ends and regional background begins" (Ecology 2018). • Budd Inlet is "among the more vigorously circulated inlets in Puget Sound" and "approximately 50 percent of Inner Inlet deposition could be attributed to sediment resuspended and transported from other regions" (NewFields 2016). • The sediment samples immediately east of the Site contain high PCP factor percentages (as discussed in the previous paragraph). • The Cascade Pole sediment contamination is recent enough (i.e., PCP was used at Cascade Pole from 1967 through 1986 [NewFields 2016] and elevated dioxins/furans concentrations remained in Cascade Pole sediment until 2001) that natural sediment deposition had not yet covered all of the surface sediments (0 to 10 centimeters) that were sampled east of the Hardel Site in 2007 and 2013.[6] In addition, a variety of secondary sources most likely contributed to the elevated dioxins/furans sediment concentrations east of the Hardel Site, including, but not limited to: • Former HFBs identified in Anchor QEA 2016 and NewFields 2016 that operated relatively recently along West Bay and on the Port Peninsula and most likely burned salt-laden wood waste. For instance, the Delson Lumber HFB (see Photos #7 and #8 in Appendix A) was located immediately north of the Hardel Site (see Figures 1 through 4) and operated until at least 1970.[7] • Other historical inner Budd Inlet HFBs that were not identified in Anchor QEA 2016 and NewFields 2016. It has been reported that "by 1922, there were 30 lumber mills, five shingle mills, and a veneer plant on the shoreline near Olympia" (Eldridge and Hough 2017).[8] It is expected that most of these mills would have burned salt-laden wood waste. Although natural sediment deposition would have buried any releases from the mills that operated 100 years ago, it is possible that operations of or releases from a few of these mills may have continued into the 1960s, 1970s, or beyond. • "Other combustion activities typical of urban and industrial environments" (Anchor QEA 2016), including "vehicle emissions, forest fires, and residential wood burning" (NewFields 2016) and "stormwater inputs from urban outfalls" (Anchor QEA 2016). For instance, the dioxins/furans sediment concentration in a 2014 sample City of Olympia stormwater catch basin located upstream of the Hardel Site was 21 ng/kg (Anchor QEA 2016). **<u>Conclusion</u>**: In summary, the Site is not a source for elevated dioxins/furans sediment concentrations near the Site. The lines of evidence indicate the dioxins/furans concentrations near the Site are from Cascade Pole and a variety of secondary sources. Therefore, elevated dioxins/furans sediment concentrations near the Site are no more relevant to additional MTCA cleanup activities at the Site than they were when Ecology issued its previous CAP in 2012.

[2] Sediment and soil concentrations are both presented in the context of conservative sediment screening levels in order to provide an "apples-to-apples" comparison for source evaluation purposes.
[3] The total dioxins/furans concentration for the maximum Cascade Pole sediment concentration was calculated using current MTCA toxicity equivalency factors.
[4] The congener profile for the PCP factor was responsible for 61% of the dioxins/furans concentrations in BI-S6, 59% in BI-S7, 48% in GS-01, 50% in GS-02, 63% in GS-03, 49% in POBI-SS-26, and 51% in POBI-SS-27. GS-04 was not evaluated.
[5] In a 1999 interview, the Plant Maintenance Superintendent "stated that no wood treating activities occurred on the site and that pentachlorophenol was not used at the property to his knowledge" (TetraTech 1999).
[6] For Budd Inlet, SAIC stated "in general it can be assumed that the surface samples (0–10 cm) consisted of sediment deposited within the past 10–20 years" (SAIC 2008). Using estimated sedimentation rates in Table 7-1 of Anchor QEA 2016 for stations located closest to the Hardel Site (i.e., 0.7 centimeters per year a GC-03 and 0.26 centimeters per year at BI-D1 post-1951), it is estimated that 10 centimeters of new sediment would be deposited every 14 to 38 years. In other words, all of the sediment in the 2007 samples collected from 0 to 10 centimeters would have been deposited no earlier than 1969.
[7] The Delson Lumber HFB is shown operating in 1970 in Photo #6 of Appendix A. The potential release of dioxins/furans from the former Delson Lumber HFB has never been assessed. Delson Lumber received a No Further Action determination from Ecology in 1997 after addressing a leaking underground storage tank.

Table 1: Responses to Nick Acklam's January 11, 2022 Verbal Comments on the August 2021 RI Data Gap Report

#	Ecology Comment (or PIONEER Comment for #10, #16-#18)	Response
14	Per Nick, Connie Groven also mentioned elevated carcinogenic PAHs (cPAHs) concentrations may be present in sediment near the Site.	Although cPAHs sediment concentrations exceeding Ecology's regional background concentration of 78 ug/kg are present throughout most of West Bay (and inner Budd Inlet), total cPAHs concentrations exceeding five times the regional background concentration were detected in two sediment samples located on the southeast Hardel shoreline (GS-04 and Hard-2) and contiguous with areas where PAHs and phthalates have been transported north along the shoreline from known PAHs and phthalates releases on the Reliable Steel property (see Table 1 and Figure 4). GeoEngineers estimated that the entire Reliable Steel upland property has PAHs soil concentrations exceeding the proposed soil cleanup levels for PAHs (GeoEngineers 2013). More importantly, many of the Reliable Steel PAHs soil exceedances are present at the ground surface. As a result, "multiple cPAHs were detected at concentrations greater than the proposed screening levels in the stormwater runoff sample collected from the outfall located on the northern portion of the [Reliable Steel] Site" and this "stormwater runoff is transporting soil particles containing cPAHs from the upland area of the [Reliable Steel] Site to surface water and sediment" (GeoEngineers 2013). "The northern portion of the [Reliable Steel] marine area has sediment with PAH concentrations greater than cleanup levels" that extend "from the surface to a depth of between approximately 1 foot and 2 feet below the mudline" (GeoEngineers 2013). Even though GeoEngineers only extended the northern extent of the PAHs sediment exceedances slightly into the southeast Hardel shoreline (see Figure 4) based on Sediment Quality Standards exceedances, the area around GS-04 should also be considered part of the Reliable Steel PAHs site because (1) the GS-04 total cPAHs sediment concentration (1,142 ug/kg) was similar to total cPAHs concentrations at other nearby sediment sampling locations that were included in the PAHs exceedance area (e.g., 908 ug/kg at RI-S-7, 1,226 ug/kg at RGS8, and 1,159 ug/kg at RGS1; see Table 2), and (2) the phthalates sediment extent demonstrates that northerly shoreline transport of Reliable Steel contaminants onto the Hardel shoreline has occurred. While transport of cPAHs from Reliable Steel surface soil and stormwater to West Bay sediment has occurred and continues to occur, transport of cPAHs in Hardel Site soil to West Bay surface water or sediment is not occurring. Only eight soil sampling locations on the Site have a total cPAHs soil concentration greater than the regional background concentration of 78 ug/kg for sediment (i.e., S-15, GB-5, B1, B3, B4, B7, B2-W, B202; see Figure 4). None of these eight soil samples are at the surface (the shallowest samples were B4 at a depth of 1 to 3 feet and B3 at a depth of 2 to 3 feet), and petroleum (e.g., heavy oil and/or diesel) was detected in seven of the eight soil samples (Stemen 2004; Greylock 2007; PIONEER 2021).[9] The total cPAHs soil concentrations have not caused groundwater screening level exceedances in any Agreed Order monitoring wells used for confirmational monitoring or in the RI data gap monitoring wells that will likely serve as the conditional groundwater point of compliance (upgradient of surface water and sediment). The total cPAHs sediment concentrations slightly exceeding the regional background concentration in the northern portion of the Hardel shoreline (e.g., 142 ug/kg in the 1998 Hard-1 sample and 107 ug/kg in the adjacent 2007 BI-S7 sample) are likely attributable to Cascade Pole for the same reasons discussed in Responses to Comments #12 and #13. However, cPAHs are also ubiquitous in an urban environment, so a variety of sources such as atmospheric deposition from point combustion sources, atmospheric deposition from non-point combustion sources (including vehicle exhaust), stormwater runoff of petroleum to City of Olympia outfalls, creosote pilings, and petroleum usage in watercrafts may have also contributed to these slightly elevated total cPAHs concentrations.
15	Based on Connie Groven's comments, Nick wanted to understand the nature and area of the shoreline restoration project relative to dioxins/furans and cPAHs sediment concentrations.	The voluntary shoreline restoration project is proposed to improve shoreline habitat that has been substantially degraded by the former industrial development of the property. According to the May 23, 2022 Joint Aquatic Resources Permit Application Form submitted by the current Site owner to the United States Army Corps of Engineers (USACE), "The proposed West Bay Yards Shoreline Restoration Project is a voluntary shoreline restoration project at the location of the former Hardel Mutual Plywoods [sic] plant in Olympia, WA. The voluntary habitat Restoration Project would create intertidal beach, salt marsh and riparian planting, improve public access along the waterfront, and preserve and enhance ecological functions of existing natural resources, and their buffers. The Restoration Project includes work below the High Tide Line (HTL), including the removal of derelict piles and concrete structures, placement of select substrate materials to restore a natural beach gradient, as well as planting of saltmarsh, placement of large woody debris, and riparian vegetation." In addition, "the existing shoreline will be expanded by placement of sand and gravel waterward of the HTL. The purpose of the expansion to the existing sand and gravel beach is to cover the existing armored shoreline with more natural sand and gravel substrate fill, which will improve intertidal habitat function as well as waterfront access and provide hand-carry launch access for the public. The proposed Restoration Project will consist of five primary elements: (1) sand and gravel beach and hand-carry launch, (2) drift sill, (3) riparian, salt marsh plantings and large woody debris, (4) debris removal, and (5) demobilization." The area where the planned Shoreline Restoration Project would occur is shown on Figures 1 through 4. Although this voluntary Shoreline Restoration Project will have benefits for human health and the environment, including covering sediments with total dioxins/furans and total cPAHs concentrations exceeding regional background concentrations, this Shoreline Restoration Project is not a component of the upland MTCA remedy. The Shoreline Restoration Project is appropriately being conducted under USACE's regulatory authority, and is distinct and separate from the ongoing MTCA upland cleanup work (previously conducted under a 2007 Agreed Order and currently conducted under the Voluntary Cleanup Program). Since Site releases are not responsible for elevated total dioxins/furans and total cPAHs sediment concentrations east of the Site as discussed in the Responses to Comment #12 through #14, a sediment remedial component is not warranted for the MTCA Site remedy.
16	Troy asked Nick about his Voluntary Cleanup Program RI/FS documentation expectations for this Site given the extensive reporting under the 2007 Agreed Order, the No Further Action determination under the 2007 Agreed Order, and the submittal of the August 2021 RI Data Gap Report to Ecology.	Nick indicated Ecology was flexible about future reporting formats. For satisfying RI reporting requirements, Nick mentioned two options: (1) preparing an addendum to the August 2021 RI Data Gap Report for future data gap investigation activities and results, or (2) preparing an updated version of the RI Data Gap Report once all remaining data gap investigation activities are complete. Nick also agreed that a Focused FS Report with a small number of alternatives made sense for this Site.
17	Troy brought Nick up to speed about the October and November 2021 methane investigation activities, and summarized the methane investigation results for Nick. Troy indicated he was considering conducting some more methane investigation work to better define the extent of the areas with elevated methane soil gas concentrations.	Nick responded that he would like to see a little bit more methane investigation work to refine the extent of impacts for the purpose of establishing areas for long-term monitoring and institutional control requirements. The additional methane investigation activities are included in the Work Plan to Address Ecology's RI Data Gaps (Attachment 2). The methane soil gas sampling outlined in the work plan was conducted in late September 2022 to maximize the ability to install and sample soil vapor probes (SVPs) before groundwater levels began rising once the rainy season started. The new SVP locations were coordinated with Joe Hunt prior to installing and sampling the SVPs. The September 2022 methane soil gas results will be presented in a future report.

[8] One of these sawmills was most likely the Henry McCleary Timber Company, which is identified on the former Hardel property in a 1924 Sanborn map (TetraTech 1999; PIONEER 2020). Another former historical mill on the former Hardel property was the circa 1891-1900 West Side Mill (McIntosh 2010). There is no available information about the specifics or approximate locations of historical West Side Mill operations.

[9] Although neither heavy oil or diesel were detected in the B2-W sample, the laboratory reporting limits for the B2-W sample were elevated (i.e., the reporting limits were 1,550 mg/kg and 388 mg/kg for total petroleum hydrocarbons in the heavy oil range and diesel range, respectively).

Table 1: Responses to Nick Acklam's January 11, 2022 Verbal Comments on the August 2021 RI Data Gap Report

#	Ecology Comment (or PIONEER Comment for #10, #16-#18)	Response
18	Although Troy mentioned that the fill material and the garage ventilation installed during the proposed redevelopment will help minimize methane concerns, Troy also discussed recommended methane mitigation measures for the proposed redevelopment with Nick. Troy said he thought the recommended methane mitigation measures for the MTCA remedy would likely include (1) implementing engineering controls for worker safety during all intrusive subsurface work, (2) installing a passive convertible venting system under the proposed parking garage, (3) installing an impervious vapor barrier under the parking garage between the passive convertible venting system and the garage slab, and (4) collecting indoor air samples following garage construction.	Nick responded that he was supportive of the methane mitigation measures outlined by Troy.

Notes:

These verbal comments were obtained during a VCP technical consultation meeting Troy Bussey of PIONEER and Kim Seely of Coastline Law Group had with Nick Acklam on January 11, 2022 to discuss Nick's review of the August 2021 RI Data Gap Report (Report).

References:

Anchor QEA 2016. Final Investigation Report, Port of Olympia Budd Inlet Sediment Site. August.

Ecology 2009. Cascade Pole Timeline, https://apps.ecology.wa.gov/cleanupsearch/site/723#site-documents, accessed August 2022. November.

Ecology 2010. Natural Background for Dioxins/Furans in WA Soils, Technical Memorandum #8. August 9.

Ecology 2012. Final Cleanup Action Plan. Hardel Mutual Plywood. Thurston County, Washington. April.

Ecology 2018. South Puget Sound Regional Background – Final Data Evaluation and Summary Report. Publication No. 18-09-117. May

Eldridge, Les and John W. Hough 2017. Images of America: Maritime Olympia and South Puget Sound.

GeoEngineers 2013. Ecology Draft Final Remedial Investigation/Feasibility Study Report. Former Reliable Steel Site. 1218 West Bay Drive NW, Olympia, Washington. July 18.

Greylock 2007. Remedial Investigation Report. Former Hardel Plywood Site. December 17.

Landau 1993. Remedial Investigation Report, Sediments Operable Unit, Cascade Pole Site, Olympia, Washington. January 22.

NewFields 2016. Budd Inlet Sediment Dioxin Source Study, Olympia, WA - Final Report. March.

PIONEER 2020. Phase I Environmental Site Assessment. Hardel Mutual Plywood Corporation, 1210 N.W. West Bay Drive, Olympia, Washington. February.

PIONEER 2021. Remedial Investigation Data Gap Report. Hardel Mutual Plywood Corporation Site. August.

SAIC 2008. Sediment Characterization Study, Budd Inlet, Olympia, WA - Final Data Report. March 12.

Stemen 2004. Phase II Environmental Site Assessment Report, Former Hardel Mutual Plywood Waterfront Property, 1210 N.W. West Bay Drive, Olympia, Washington. July 26.

McIntosh, Sarah Smyth 2010. West Bay Industrial History from 1891 to 2008, pp. 83-88 in Olympia Washington: A People's History, edited by Drew Crooks.

TetraTech 1999. Phase I Environmental Site Assessment. Hardel Mutual Plywood Waterfront Property, 1210 N.W. West Bay Drive, Olympia, Washington. 1999.

Washington State Historical Society 2022. Catalog ID C1986.43.0.255, Collections Search - Washington State Historical Society (washingtonhistory.org).

Table 2: Existing Sediment and Soil Results for Dioxins/Furans, PCP, PCBs, and cPAHs On or Near the Hardel Mutual Plywood Corporation Site

						Dioxins/Furans (ng/kg)																																			
Media	Sample ID	Depth (bgs)		Date	Report	2,3,7,8-TCDF	Qualifier	2,3,7,8-TCDD	Qualifier	1,2,3,7,8-PeCDF	Qualifier	2,3,4,7,8-PeCDF	Qualifier	1,2,3,7,8-PeCDD	Qualifier	1,2,3,4,7,8-HxCDF	Qualifier	1,2,3,6,7,8-HxCDF	Qualifier	2,3,4,6,7,8-HxCDF	Qualifier	1,2,3,7,8,9-HxCDF	Qualifier	1,2,3,4,7,8-HxCDD	Qualifier	1,2,3,6,7,8-HxCDD	Qualifier	1,2,3,7,8,9-HxCDD	Qualifier	1,2,3,4,6,7,8-HpCDF	Qualifier	1,2,3,4,7,8,9-HpCDF	Qualifier	1,2,3,4,6,7,8-HpCDD	Qualifier	OCDF	Qualifier	OCDD	Qualifier	Dioxins/Furans TEQ [1]	Qualifier
Sediment	Hard-1	0-10	cm	June 10, 1998	Ecology 1999	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	Hard-2	0-10	cm	June 10, 1998		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	GS-01	0-10	cm	August 13, 2007	Greylock 2007	1.3		0.99	U	5.0	U	5.0	U	5.0	U	8.4		7.5		8.4		5.0	U	6.6		36		14		250		9.4		550		410		3,800		22	
	GS-02	0-10	cm	August 13, 2007		2.5		1.6		4.9	U	5.9		11		11		15	*	8.8		4.9	U	11		59		24		320		13		950		520		6,200		43	
	GS-03	0-10	cm	August 13, 2007		2.8		1.4		4.9	U	6.2		7.2		9.6		13	*	11		4.9	U	9.8		55		22		310		12		870		510		6,100		37	
	GS-04	0-10	cm	August 13, 2007		2.3		0.94		4.6	U	4.6	U	4.6	U	4.6	U	5.7		5.1		4.6	U	5.7		33		12		190		7.3		720		390		6,200		22	
	BI-TISSUE1	0-10	cm	April 6, 2007	SAIC 2008	0.048	U	0.18		0.39		0.46		0.60	J	1.3		0.86		0.99		0.090		1.0	J	6.2		2.6		30		1.4		140		63		1,080		4.3	
	BI-TISSUE1B	0-10	cm	April 6, 2007		1.4		0.82		1.3		1.7		3.7	J	4.4		3.3		3.4	J	0.28		6.6	J	30		15		142		5.6		970		416		7,930		25	
	BI-S7	0-10	cm	April 12, 2007		3.1		1.7		4.8		6.0		12		19		14		15		1.3	J	15	J	101		40		525		19		1,530		910		8,480		60	
	BI-S6	0-10	cm	April 12, 2007		2.3		1.1		2.6	J	3.0	J	5.8		12		7.4		8.1		0.61	J	9.3		48	J	23	J	270		8.4	J	838	J	431	J	5,770	J	32	
	RGS1	surface		February - March 2008	GeoEngineers 2013	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		2-4	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
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	RGS2	surface		February - March 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
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	RGS3	surface		February - March 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RGS6	surface		February - March 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RGS7	surface		February - March 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		0-2	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		2-4	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RGS8	surface		February - March 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
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		6-8	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RGS9	surface		February - March 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RGS10	surface		February - March 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RGS11	surface		February - March 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-S-2	surface		July 12, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-S-3	surface		July 12, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-S-4	surface		July 12, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-S-5	surface		July 12, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-S-6	surface		July 12, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-S-7	surface		July 12, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	POBI-SS-22	0-10	cm	March 6, 2013	Anchor 2016	3.0		0.73		2.2	J	2.3		4.3		7.9		4.8		8.6		2.6	J	4.9		27		11		153		5.3		395		189		2,530		19.1	
	POBI-SS-26	0-10	cm	March 6, 2013		3.0		0.96	*	2.1		2.6		4.3		7.7		4.7		8.5		2.1	J	4.6		28		11		168		5.8		416		244		2,850		20	
	POBI-SS-27	0-10	cm	March 6, 2013		4.0		1.4		3.9	J	4.7		11		16		11		23		5.6	J	11		73		26		433		14		1,090		638		6,600	J	49	
Soil	S-1	8-12	ft	June 22, 2004	Stemen 2004	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	S-9	4-8	ft	June 22, 2004		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	S-15	8-12	ft	June 22, 2004		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	S-20	8	ft	July 9, 2004		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		11	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	S-24	4	ft	July 9, 2004		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
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	GB-1	5	ft	July 30, 2007	Greylock 2007	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	GB-2	5	ft	July 30, 2007		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	GB-5	10	ft	July 30, 2007		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		16	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
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Table 2: Existing Sediment and Soil Results for Dioxins/Furans, PCP, PCBs, and cPAHs On or Near the Hardel Mutual Plywood Corporation Site

Media	Sample ID	Depth (bgs)		Date	Report	Dioxins/Furans (ng/kg)																																			
						2,3,7,8-TCDF	Qualifier	2,3,7,8-TCDD	Qualifier	1,2,3,7,8-PeCDF	Qualifier	2,3,4,7,8-PeCDF	Qualifier	1,2,3,7,8-PeCDD	Qualifier	1,2,3,4,7,8-HxCDF	Qualifier	1,2,3,6,7,8-HxCDF	Qualifier	2,3,4,6,7,8-HxCDF	Qualifier	1,2,3,7,8,9-HxCDF	Qualifier	1,2,3,4,7,8-HxCDD	Qualifier	1,2,3,6,7,8-HxCDD	Qualifier	1,2,3,7,8,9-HxCDD	Qualifier	1,2,3,4,6,7,8-HpCDF	Qualifier	1,2,3,4,7,8,9-HpCDF	Qualifier	1,2,3,4,6,7,8-HpCDD	Qualifier	OCDF	Qualifier	OCDD	Qualifier	Dioxins/Furans TEQ [(1)]	Qualifier
Soil	GB-6	5	ft	July 30, 2007	Greylock 2007 (cont.)	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	GB-7	6	ft	July 30, 2007		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	GB-8	6.5-7.5	ft	July 30, 2007		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	MW-1	6	ft	July 31, 2007		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	MW-7	6	ft	August 1, 2007		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		10	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RGB1	surface		February 8, 2008	GeoEngineers 2013	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RGB2	surface		February 8, 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		3.5	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RGB3	surface		February 8, 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		4	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RGB4	surface		February 8, 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		5	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		1	ft	March 4, 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		1.5	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RGB16	6	ft	February 11, 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RGB17	5	ft	February 11, 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	PS GRIT	surface		February 8, 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	DITCH 1	surface		February 11, 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		4	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	DITCH 2	surface		February 11, 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		2.5	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	MW-9	surface		February 8, 2008		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		4	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-15	0.5	ft	July 8, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		2.5	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-17	0.5	ft	July 8, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		3	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		5	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-18	0.5	ft	July 8, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-19	0.5	ft	July 8, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		3	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		4	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-20	0.5	ft	July 13, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		1.5-2.5	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-21	0.5	ft	July 8, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-22	0.5	ft	July 8, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		2	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		3	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-23	0.5	ft	July 8, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		2.5	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-24	0.5	ft	July 8, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		2.5	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-25	1	ft	July 8, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		3	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	

Table 2: Existing Sediment and Soil Results for Dioxins/Furans, PCP, PCBs, and cPAHs On or Near the Hardel Mutual Plywood Corporation Site

						Dioxins/Furans (ng/kg)																																			
Media	Sample ID	Depth (bgs)		Date	Report	2,3,7,8-TCDF	Qualifier	2,3,7,8-TCDD	Qualifier	1,2,3,7,8-PeCDF	Qualifier	2,3,4,7,8-PeCDF	Qualifier	1,2,3,7,8-PeCDD	Qualifier	1,2,3,4,7,8-HxCDF	Qualifier	1,2,3,6,7,8-HxCDF	Qualifier	2,3,4,6,7,8-HxCDF	Qualifier	1,2,3,7,8,9-HxCDF	Qualifier	1,2,3,4,7,8-HxCDD	Qualifier	1,2,3,6,7,8-HxCDD	Qualifier	1,2,3,7,8,9-HxCDD	Qualifier	1,2,3,4,6,7,8-HpCDF	Qualifier	1,2,3,4,7,8,9-HpCDF	Qualifier	1,2,3,4,6,7,8-HpCDD	Qualifier	OCDF	Qualifier	OCDD	Qualifier	Dioxins/Furans TEQ [(1)]	Qualifier
Soil	RI-26	0.5	ft	July 8, 2010	GeoEngineers 2013 (cont.)	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		2.5	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-27	0-0.5	ft	July 13, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		2.5-3.5	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-28	0.5	ft	July 8, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		3.5	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-29	0.5	ft	July 8, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		4	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	RI-30	0.5	ft	July 8, 2010		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		4	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	EC-7	2-3	ft	April 10, 2013		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	EC-9	0-1	ft	April 10, 2013		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		2-2.6	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	EC-10	0-0.5	ft	April 10, 2013		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B1	4-5	ft	June 3, 2020	PIONEER 2021	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B2	2-4	ft	June 3, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B3	2-3	ft	June 3, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B4	1-3	ft	June 3, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		1-3 (DUP)	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		11-12	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B5	3-4	ft	June 3, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B6	3-4	ft	June 3, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B7	3-4	ft	June 3, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B8	4-5	ft	June 3, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B9	6-7	ft	June 3, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B2-C	8.5-10	ft	August 20, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B2-E	3-5.5	ft	August 20, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B2-N	3-5	ft	August 20, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B2-S	8-10	ft	August 20, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
		8-10 (DUP)	ft			--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B2-W	7-8.5	ft	August 20, 2020		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
	B101	0.5-3	ft	August 20, 2020		0.65	U	1.0	U	1.4	U	0.68	U	0.84	U	0.68	U	1.2	J	1.2	*	0.54	U	0.70	U	2.1	J	0.64	*	11		0.64	U	44		21		480		2.4	
	B102	5-7	ft	August 20, 2020		0.60	U	0.87	U	1.4	U	0.63	U	0.77	U	0.85	U	0.72	U	0.77	U	0.80	U	0.82	U	1.5	*	0.90	J	3.9	*	0.83	U	38		11		440		2.0	
	B103	1-3	ft	August 20, 2020		0.58	U	0.64	U	0.77	U	0.41	U	0.55	U	0.44	U	0.47	U	0.35	U	0.46	U	0.49	U	0.72	U	0.47	U	1.5	J	0.55	U	5.1		2.0	*	60		0.95	
	B104	1-3	ft	August 20, 2020		0.49	U	0.83	U	0.56	U	0.43	U	0.56	U	0.37	U	0.31	U	0.31	U	0.34	U	0.47	U	0.42	U	0.39	U	0.76	*	0.52	U	4.9		1.9	*	43		1.0	
	B105	2-4	ft	August 20, 2020		0.59	U	1.2	U	0.95	U	0.55	U	0.65	U	0.60	U	0.65	U	0.57	U	0.56	U	0.95	*	3.1	J	1.7	*	5.5	*	0.44	U	76		32		620		2.8	
		2-4 (DUP)	ft			0.95	U	1.1	U	1.6	U	0.60	U	0.99	U	0.70	U	0.81	U	0.97	U	0.97	U	5.7		9.2		5.4	*	9.8		0.83	U	300		64		1,900		7.1	
	B106	6-8	ft	August 20, 2020		0.54	U	0.71	U	0.76	U	0.43	U	0.51	U	0.40	U	0.33	U	0.34	U	0.39	U	0.41	U	0.39	U	0.41	U	0.32	U	0.50	U	0.79	J	0.78	U	6.9	BJ	0.86	
	B107	2-4	ft	August 20, 2020		0.27	U	0.37	U	0.37	U	0.21	U	0.29	U	0.20	U	0.23	U	0.26	U	0.23	U	0.24	U	0.19	U	0.22	U	0.64	*	0.41	U	4.5		2.7	BJ	40		0.53	
	B202	5-6	ft	January 11, 2021		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	

PIONEER TECHNOLOGIES CORPORATION

Table 2: Existing Sediment and Soil Results for Dioxins/Furans, PCP, PCBs, and cPAHs On or Near the Hardel Mutual Plywood Corporation Site

Media	Sample ID	Depth (bgs)		Total Organic Carbon	PCP (ug/kg)		PCBs (ug/kg)																	cPAHs (ug/kg)																
					PCP	Qualifier	Aroclor 1016	Qualifier	Aroclor 1221	Qualifier	Aroclor 1232	Qualifier	Aroclor 1242	Qualifier	Aroclor 1248	Qualifier	Aroclor 1254	Qualifier	Aroclor 1260	Qualifier	Total PCBs OC [2,3]	Total PCBs [2]	Qualifier	Benzo[a]pyrene	Qualifier	Benzo[a]anthracene	Qualifier	Benzo[b]flouranthene	Qualifier	Benzo[k]fluoranthene	Qualifier	Chrysene	Qualifier	Dibenzo[a,h]anthracene	Qualifier	Indeno[1,2,3-cd]pyrene	Qualifier	cPAHs TEQ OC [1,3]	cPAHs TEQ [1]	Qualifier
Sediment	Hard-1	0-10	cm	0.0757	87	J	--		--		--		--		--		--		--			--		94		44	U	160		54		152		93		131	J	--	142	
	Hard-2	0-10	cm	0.0546	86	J	--		--		--		--		--		--		--			--		343		315		465		189		383		125		270		--	483	
	GS-01	0-10	cm	0.119	4,400 [4]	U	100	U	200	U	100	U	100	U	100	U	100	U	100	U		800	U	730	U	730	U	730	U	730	U	730	U	730	U	730	U	--	551	U
	GS-02	0-10	cm	0.0862	4,300 [4]	U	99	U	200	U	99	U	99	U	99	U	99	U	99	U		794	U	710	U	710	U	710	U	710	U	710	U	710	U	710	U	--	536	U
	GS-03	0-10	cm	0.101	4,000 [4]	U	100	U	200	U	100	U	100	U	100	U	100	U	100	U		800	U	650	U	650	U	650	U	650	U	650	U	650	U	650	U	--	491	U
	GS-04	0-10	cm	0.031	3,500 [4]	U	95	U	190	U	95	U	95	U	95	U	95	U	95	U		760	U	860		840		1,000		580	U	1,100		580	U	580	U	--	1,142	
	BI-TISSUE1	0-10	cm	0.0077	12	U	310	U	310	U	310	U	310	U	310	U	1,950		310	U	2,880	22		62,340		63,640		105,190	J	-- [7]		71,430		9,480		40,260		84,911	654	
	BI-TISSUE1B	0-10	cm	0.0582	81	U	60	U	60	U	60	U	60	U	60	U	2,060		60	U	2,240	130.4		18,900		18,900		30,760	J	-- [7]		20,620		2,750		12,370		25,584	1,489	
	BI-S7	0-10	cm	0.0926	140	U	110	U	250		110	U	220	U	110	U	110	U	110	U	635	59		840		640		1,520		-- [7]		1,190		230		680		1,159	107	
	BI-S6	0-10	cm	0.048	--		--		--		--		--		--		--		--		--	--		--		--		--		--		--		--		--		--	--	
	RGS1	surface		0.0129	30	U	--		--		--		--		--		--		--		--	--		66,667		60,465		116,280		-- [7]		68,992		18,600		29,457		89,837	1,159	
		2-4	ft	0.0168	100	U	--		--		--		--		--		--		--		--	--		1,429		1,310		1,429		-- [7]		1,488		369		1,190	U	1,814	30	
		6-8	ft	0.0121	99	U	--		--		--		--		--		--		--		--	--		1,653	U	1,653	U	1,653	U	-- [7]		1,653	U	512	U	1,653	U	1,108	13	U
	RGS2	surface		0.0175	30	U	--		--		--		--		--		--		--		--	--		28,000		25,710		50,290		-- [7]		30,290		6,286		10,860		37,618	658	
		0-2	ft	0.0147	100	U	--		--		--		--		--		--		--		--	--		21,770		21,090		39,460		-- [7]		23,810		4,626		9,524		29,478	433	
	RGS3	surface		0.0203	3.0	U	--		--		--		--		--		--		--		--	--		10,840		9,852		19,700		-- [7]		11,820		3,005		3,448		14,559	296	
	RGS6	surface		0.00481	98	U	-- [5]		-- [5]		-- [5]		-- [5]		-- [5]		-- [5]		-- [5]		--	93		85,240		91,480		170,500		-- [7]		118,500		9,148		37,400		117,278	564	
	RGS7	surface		0.0081	99	U	-- [5]		-- [5]		-- [5]		-- [5]		-- [5]		-- [5]		-- [5]		--	96		93,830		85,190		172,800		-- [7]		106,200		22,200		43,200		127,231	1,031	
		0-2	ft	0.0563	100	U	--		--		--		--		--		--		--		--	--		7,815		7,105		15,280		-- [7]		9,059		3,020		2,664		10,712	603	
		2-4	ft	0.0336	990	U	--		--		--		--		--		--		--		--	--		863		7,738		1,518		-- [7]		923		238		595		1,881	63	
	RGS8	surface		0.0037	99	U	--		--		--		--		--		--		--		--	--		248,649		210,800		459,459		-- [7]		251,400		45,946		86,500		331,433	1,226	
		2-4	ft	0.0050	990	U	--		--		--		--		--		--		--		--	--		4,000	U	4,000	U	4,000	U	-- [7]		4,000	U	1,200	U	4,000	U	2,680	13	U
		6-8	ft	0.0080	990	U	--		--		--		--		--		--		--		--	--		4,000		6,875		3,125		-- [7]		6,250		750	U	2,500	U	5,225	42	
	RGS9	surface		0.0216	990	U	--		--		--		--		--		--		--		--	--		8,333		10,190		14,350		-- [7]		11,110		556		2,870		11,241	243	
	RGS10	surface		0.0153	100	U	--		--		--		--		--		--		--		--	--		16,990		16,340		30,720		-- [7]		18,950		2,810		7,190		22,886	350	
	RGS11	surface		0.0306	100	U	--		--		--		--		--		--		--		--	--		2,124		1,928		4,020		-- [7]		2,386		490		948		2,886	88	
	RI-S-2	surface		0.0163	--		--		--		--		--		--		--		--		--	--		200,000		210,000		330,000		-- [7]		270,000		42,000		100,000		270,900	4,416	
	RI-S-3	surface		0.00558	--		--		--		--		--		--		--		--		--	--		65,000		56,000		120,000		-- [7]		65,000		7,500		17,000		85,700	478	
	RI-S-4	surface		0.00684	--		--		--		--		--		--		--		--		--	--		450,000		660,000		760,000		-- [7]		670,000		86,000		200,000		627,300	4,291	
	RI-S-5	surface		0.0064	--		--		--		--		--		--		--		--		--	--		110,000		130,000		190,000		-- [7]		130,000		22,000		66,000		152,100	973	
	RI-S-6	surface		0.00963	--		--		--		--		--		--		--		--		--	--		60,000		53,000		110,000		-- [7]		58,000		7,900		18,000		79,470	765	
	RI-S-7	surface		0.00942	--		--		--		--		--		--		--		--		--	--		71,000		66,000		120,000		-- [7]		71,000		16,000		45,000		96,410	908	
	POBI-SS-22	0-10	cm	0.0393	48	U	--		--		--		--		--		--		--		--	--		46		42		110		-- [8]		71		8.7		28		--	66	
	POBI-SS-26	0-10	cm	0.0378	35	J	--		--		--		--		--		--		--		--	--		78		72		160		-- [8]		110		13		41		--	108	
	POBI-SS-27	0-10	cm	0.0658	46	J	--		--		--		--		--		--		--		--	--		65		60		150		-- [8]		96		16		38		--	92	
Soil	S-1	8-12	ft	--	5,000	U	--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
	S-9	4-8	ft	--	5,000	U	--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
	S-15	8-12	ft	--	5,000	U	--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	640		100	U	100	U	--	81	
	S-20	8	ft	--	5,000	U	-- [6]		200	U	200	U	200	U	200	U	200	U	200	U	--	1,200	U	100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
		11	ft	--	5,000	U	-- [6]		200	U	200	U	200	U	200	U	200	U	200	U	--	1,200	U	100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
	S-24	4	ft	--	5,000	U	-- [6]		200	U	200	U	200	U	200	U	200	U	200	U	--	1,200	U	100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
		6	ft	--	5,000	U	-- [6]		200	U	200	U	200	U	200	U	200	U	200	U	--	1,200	U	100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
	GB-1	5	ft	--	5,000	U	--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
	GB-2	5	ft	--	5,000	U	--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
	GB-5	10	ft	--	5,000	U	--		--		--		--		--		--		--		--	--		180		100	U	100	U	270		1,100		100	U	100	U	--	238	
		16	ft	--	5,000	U	--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
		16 (DUP)	ft	--	5,000	U	--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U

Table 2: Existing Sediment and Soil Results for Dioxins/Furans, PCP, PCBs, and cPAHs On or Near the Hardel Mutual Plywood Corporation Site

Media	Sample ID	Depth (bgs)		Total Organic Carbon	PCP (ug/kg) PCP	Qualifier	PCBs (ug/kg) Aroclor 1016	Qualifier	Aroclor 1221	Qualifier	Aroclor 1232	Qualifier	Aroclor 1242	Qualifier	Aroclor 1248	Qualifier	Aroclor 1254	Qualifier	Aroclor 1260	Qualifier	Total PCBs OC[(2,3)]	Total PCBs[(2)]	Qualifier	cPAHs (ug/kg) Benzo[a]pyrene	Qualifier	Benzo[a]anthracene	Qualifier	Benzo[b]flouranthene	Qualifier	Benzo[k]fluoranthene	Qualifier	Chrysene	Qualifier	Dibenzo[a,h]anthracene	Qualifier	Indeno[1,2,3-cd]pyrene	Qualifier	cPAHs TEQ OC[(1,3)]	cPAHs TEQ[(1)]	Qualifier
Soil	GB-6	5	ft	--	--		--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
	GB-7	6	ft	--	5,000	U	--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
	GB-8	6.5-7.5	ft	--	5,000	U	--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
	MW-1	6	ft	--	--		--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
	MW-7	6	ft	--	5,000	U	--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
		10	ft	--	5,000	U	--		--		--		--		--		--		--		--	--		100	U	100	U	100	U	100	U	100	U	100	U	100	U	--	76	U
	RGB1	surface		--	300	U	--		--		--		--		--		--		--		--	--		36		57		79	JR	30	U	48		30	U	32		--	56	
	RGB2	surface		--	300	U	--		--		--		--		--		--		--		--	--		140		120		180	JR	78	JL	170		33		95		--	192	
		3.5	ft	--	300	U	--		--		--		--		--		--		--		--	--		30	U	30	U	30	U	30	U	30	U	30	U	30	U	--	23	U
	RGB3	surface		--	300	U	--		--		--		--		--		--		--		--	--		490		530		570	JR	250	JL	600		90		280		--	668	
		4	ft	--	300	U	--		--		--		--		--		--		--		--	--		30	U	30	U	30	U	30	U	30	U	30	U	30	U	--	23	U
	RGB4	surface		--	3,000	U	--		--		--		--		--		--		--		--	--		4,400		5,800		12,000	JR	5,000	JL	18,000		1,500	U	3,100		--	7,245	
		5	ft	--	300	U	--		--		--		--		--		--		--		--	--		30	U	30	U	30	U	30	U	30	U	30	U	30	U	--	23	U
		1	ft	--	4,200		--		--		--		--		--		--		--		--	--		2,400		1,900		4,600		1,200		6,000		400		2,200		--	3,490	
		1.5	ft	--	3,000	U	--		--		--		--		--		--		--		--	--		1,100		940		1,400		550		1,400		300	U	850		--	1,503	
	RGB16	6	ft	--	3,000	U	--		--		--		--		--		--		--		--	--		300	U	300	U	300	U	300	U	300	U	300	U	300	U	--	227	U
	RGB17	5	ft	--	300	U	--		--		--		--		--		--		--		--	--		30	U	30	U	30	U	30	U	30	U	30	U	30	U	--	23	U
	PS GRIT	surface		--	300	U	--		--		--		--		--		--		--		--	--		30	U	30	U	30	U	30	U	33		30	U	30	U	--	23	
	DITCH 1	surface		--	3,000	U	--		--		--		--		--		--		--		--	--		660		600		640	JR	350	JL	690		300	U	460		--	887	
		4	ft	--	3,000	U	--		--		--		--		--		--		--		--	--		1,800		1,600		1,800	JR	880	JL	1,800		340		1,100		--	2,390	
	DITCH 2	surface		--	3,000	U	--		--		--		--		--		--		--		--	--		550		530		680	JR	300	U	740		300	U	390		--	747	
		2.5	ft	--	3,000	U	--		--		--		--		--		--		--		--	--		1,500	U	1,500	U	1,500	U	300	U	1,500	U	300	U	300	U	--	953	U
	MW-9	surface		--	3,000	U	--		--		--		--		--		--		--		--	--		1,200		1,200		1,700	JR	740	JL	1,600		320		920		--	1,704	
		4	ft	--	3,000	U	--		--		--		--		--		--		--		--	--		670		700		640		330	CA[(9)]	820		300	U	330		--	893	
	RI-15	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		18		21		51		17		54		10.0	U	21		--	30	
		2.5	ft	--	--		--		--		--		--		--		--		--		--	--		280		270		290		110		300		41		150		--	369	
	RI-17	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		24		22		28		11		28		10.0	U	15		--	32	
		3	ft	--	--		--		--		--		--		--		--		--		--	--		230		150		290		96		180		35		140		--	303	
		5	ft	--	--		--		--		--		--		--		--		--		--	--		10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	--	7.6	U
	RI-18	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		410		310		710		210		530		100		370		--	585	
	RI-19	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		10.0	U	10.0	U	12		10.0	U	10.0	U	10.0	U	10.0	U	--	8.3	
		3	ft	--	--		--		--		--		--		--		--		--		--	--		1,500		1,200		2,000	VE	640		2,000	VE	250		1,000		--	2,029	
		4	ft	--	--		--		--		--		--		--		--		--		--	--		10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	--	7.6	U
	RI-20	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		200		180		370		120		330		39		170		--	291	
		1.5-2.5	ft	--	--		--		--		--		--		--		--		--		--	--		620		650		820		300		930		100	U	370		--	848	
	RI-21	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		10.0	U	10.0	U	18		10.0	U	15		10.0	U	10.0	U	--	9.0	
	RI-22	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		470		430		650		230		580		80		330		--	648	
		2	ft	--	--		--		--		--		--		--		--		--		--	--		1,200		1,200		1,600		520		1,500		180		740		--	1,639	
		3	ft	--	--		--		--		--		--		--		--		--		--	--		12		17		19		10.0	U	16		10.0	U	10.0	U	--	17	
	RI-23	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		360		260		480		180		360		67		280		--	490	
		2.5	ft	--	--		--		--		--		--		--		--		--		--	--		1,910		180		400		90		280		64		360		--	2,022	
	RI-24	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		160		150		230		84		200		33		120		--	224	
		2.5	ft	--	--		--		--		--		--		--		--		--		--	--		15		15		23		10.0	U	20		10.0	U	13		--	21	
	RI-25	1	ft	--	--		--		--		--		--		--		--		--		--	--		230		210		310		110		280		44		180		--	318	
		3	ft	--	--		--		--		--		--		--		--		--		--	--		1,100		1,000		1,600		470		1,200		220		860		--	1,527	

Table 2: Existing Sediment and Soil Results for Dioxins/Furans, PCP, PCBs, and cPAHs On or Near the Hardel Mutual Plywood Corporation Site

Media	Sample ID	Depth (bgs)		Total Organic Carbon	PCP (ug/kg)		PCBs (ug/kg)																	cPAHs (ug/kg)																	
					PCP	Qualifier	Aroclor 1016	Qualifier	Aroclor 1221	Qualifier	Aroclor 1232	Qualifier	Aroclor 1242	Qualifier	Aroclor 1248	Qualifier	Aroclor 1254	Qualifier	Aroclor 1260	Qualifier	Total PCBs OC (2,3)	Total PCBs (2)	Qualifier	Benzo[a]pyrene	Qualifier	Benzo[a]anthracene	Qualifier	Benzo[b]flouranthene	Qualifier	Benzo[k]fluoranthene	Qualifier	Chrysene	Qualifier	Dibenzo[a,h]anthracene	Qualifier	Indeno[1,2,3-cd]pyrene	Qualifier	cPAHs TEQ OC (1,3)	cPAHs TEQ (1)	Qualifier
Soil	RI-26	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		420		330		550		210		470		87		340		--	576	
		2.5	ft	--	--		--		--		--		--		--		--		--		--	--		10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	--	7.6	U
	RI-27	0-0.5	ft	--	--		--		--		--		--		--		--		--		--	--		29		26		47		13		40		10.0	U	23		--	41	
		2.5-3.5	ft	--	--		--		--		--		--		--		--		--		--	--		63		52		110		31		110		11		50		--	90	
	RI-28	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		390		340		580		170		490		97		280		--	542	
		3.5	ft	--	--		--		--		--		--		--		--		--		--	--		10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	--	7.6	U
	RI-29	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		260		190		350		120		250		46		200		--	353	
		4	ft	--	--		--		--		--		--		--		--		--		--	--		110		77		150		46		110		20		83		--	149	
	RI-30	0.5	ft	--	--		--		--		--		--		--		--		--		--	--		18		15		25		10.0	U	20		10.0	U	14		--	25	
		4	ft	--	--		--		--		--		--		--		--		--		--	--		49		50		78		28		86		10.0		30		--	69	
	EC-7	2-3	ft	--	62	J	--		--		--		--		--		--		--		--	--		120		93		170		53		160		40		120		--	169	
	EC-9	0-1	ft	--	280	U	--		--		--		--		--		--		--		--	--		2,700		2,700		3,700		1,200		3,000		400		1,200		--	3,650	
		2-2.6	ft	--	580	U	--		--		--		--		--		--		--		--	--		470		370		690		230		520		120		350		--	651	
	EC-10	0-0.5	ft	--	140	U	--		--		--		--		--		--		--		--	--		41		18		62		23		37		23	J	53		--	59	
	B1	4-5	ft	--	--		--		--		--		--		--		--		--		--	--		155		184		252		121		265		54		62		--	225	
	B2	2-4	ft	--	--		--		--		--		--		--		--		--		--	--		53	U	83		62		53	U	141		53	U	53	U	--	51	
	B3	2-3	ft	--	--		--		--		--		--		--		--		--		--	--		110		120		150		83		172		46		41	U	--	154	
	B4	1-3	ft	--	--		--		--		--		--		--		--		--		--	--		38	U	38	U	38	U	38	U	38	U	38	U	38	U	--	29	U
		1-3 (DUP)	ft	--	--		--		--		--		--		--		--		--		--	--		68		109		71		67		109		38	U	38	U	--	98	
		11-12	ft	--	--		--		--		--		--		--		--		--		--	--		44	U	44	U	44	U	44	U	44	U	44	U	44	U	--	33	U
	B5	3-4	ft	--	108	U	--		--		--		--		--		--		--		--	--		54	U	54	U	54	U	54	U	54	U	54	U	54	U	--	41	U
	B6	3-4	ft	--	116	U	--		--		--		--		--		--		--		--	--		58	U	58	U	107		58	U	58	U	58	U	65		--	55	
	B7	3-4	ft	--	115	U	--		--		--		--		--		--		--		--	--		396		180		487		347		440		170		400		--	559	
	B8	4-5	ft	--	--		--		--		--		--		--		--		--		--	--		44	U	44	U	44	U	44	U	44	U	44	U	44	U	--	33	U
	B9	6-7	ft	--	--		--		--		--		--		--		--		--		--	--		38	U	38	U	38	U	38	U	38	U	38	U	38	U	--	29	U
	B2-C	8.5-10	ft	--	--		--		--		--		--		--		--		--		--	--		89	U	89	U	89	U	89	U	89	U	89	U	89	U	--	67	U
	B2-E	3-5.5	ft	--	--		--		--		--		--		--		--		--		--	--		12	U	12	U	12	U	12	U	12	U	12	U	12	U	--	9	U
	B2-N	3-5	ft	--	--		--		--		--		--		--		--		--		--	--		14	U	14	U	14	U	14	U	14	U	14	U	14	U	--	11	U
	B2-S	8-10	ft	--	--		--		--		--		--		--		--		--		--	--		24		31		65		28		29		15	U	52		--	42	
		8-10 (DUP)	ft	--	--		--		--		--		--		--		--		--		--	--		19	U	24		19		19	U	19	U	19	U	25		--	18	
	B2-W	7-8.5	ft	--	--		--		--		--		--		--		--		--		--	--		182		167		239		91		149		25		135		--	249	
	B101	0.5-3	ft	--	--		5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	--	38	U	--		--		--		--		--		--		--		--	--	
	B102	5-7	ft	--	--		6.0	U	6.0	U	6.0	U	6.0	U	6.0	U	6.0	U	6.0	U	--	42	U	--		--		--		--		--		--		--		--	--	
	B103	1-3	ft	--	--		3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	--	21	U	--		--		--		--		--		--		--		--	--	
	B104	1-3	ft	--	--		5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	--	38	U	--		--		--		--		--		--		--		--	--	
	B105	2-4	ft	--	--		5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	--	38	U	--		--		--		--		--		--		--		--	--	
		2-4 (DUP)	ft	--	--		4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	--	31	U	--		--		--		--		--		--		--		--	--	
	B106	6-8	ft	--	--		50	U	50	U	50	U	50	U	50	U	50	U	50	U	--	351	U	--		--		--		--		--		--		--		--	--	
	B107	2-4	ft	--	--		4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	--	30	U	--		--		--		--		--		--		--		--	--	
	B202	5-6	ft	--	--		--		--		--		--		--		--		--		--	--		2,500		12,000		4,100		1,600		11,000		1,000	U	1,000	U	--	4,480	

Notes:

--: Constituent not analyzed or not reported; bgs: below ground surface; cm: centimeters; cPAH: carcinogenic polycyclic aromatic hydrocarbons; DUP: Duplicate sample; ft: feet; kg: kilograms; HpCDD: Heptachloro dibenzo-p-dioxin; HpCDF: Heptachlorodibenzofuran; HxCDD: Hexachloro dibenzo-p-dixion; HxCDF: Hexachloro dibenzofuran; ng: nanograms; OC: Organic carbon; OCDD: Octachloro dibenzo-p-dioxin; OCDF: Octachloro dibenzofuran; PCBs: Polychlorinated biphenyls; PCP: Pentachlorophenol; PeCDD: Pentachloro dibenzo-p-dioxin; PeCDF: Pentachloro dibenzofuran; TCDD: Tetrachloro dibenzo-p-dioxin; TCDF: Tetrachloro dibenzofuran; TEQ: Toxic equivalency quotient; ug: micrograms.

Results are shown as two significant figures in standard notation, except numbers greater than 100 are rounded to a whole number. Extra digits are added if necessary to clarify whether or not a concentration is equal to or greater than a screening level.

For the source evaluation purpose of this table, the screening levels used for total dioxins/furans TEQ are the Regional Background of South Puget Sound (19 ng/kg) and five times the background (95 ng/kg).

For the source evaluation purpose of this table, the screening levels used for PCP are the Sediment Cleanup Objective (SCO; 360 ug/kg) and five times the SCO (1,800 ug/kg).

For the source evaluation purpose of this table, the screening levels used for PCBs are the Lowest Adverse Affect Threshold (LAET; 130 ug/kg) and five times the LAET (650 ug/kg).

For the source evaluation purpose of this table, the screening levels used for total cPAHs TEQ are the Regional Background of South Puget Sound (78 ug/kg) and five times the background (390 ug/kg).

Constituent is detected and concentration is less than or equal to the screening level.

Constituent is detected and concentration is greater than the screening level and less than or equal to five times the screening level.

Constituent is detected and concentration is greater than five times the screening level.

Italicized values are conentrations that were reported normalized for Total Organic Carbon. Total/TEQ sums have been converted back to dry weight concentration values.

Reports:

- Anchor 2016 - Final Investigation Report - Port of Olympia Budd Inlet Sediment Site. August 2016. (Tables 4-3 and 4-4 were used as the data source).
- Ecology 1999 - Lower Budd Inlet Sediment Characterization Study. February 1999. (The lab report was used as the data source).
- GeoEngineers 2013 - Ecology Draft Final Remedial Investigation/Feasibility Study Report- Former Reliable Steel Site. July 2013. (Tables 9 through 24 were used as the data source).
- Greylock 2007 - Former Hardel Plywood Site - Remedial Investigation Report. December 2007. (The lab reports were used as the data source).
- PIONEER 2021 - Remedial Invesitgation Data Gap Report - Hardel Mutual Plywood Corporation Site. August 2021. (The PIONEER database and Appendix E were used as the data source).
- SAIC 2008 - Sediment Characterization Study Budd Inlet, Olympia, WA. March 2008. (Appendix B was used as the data source).
- Stemen 2004 - Phase II Environmental Site Assessment Report. July 2004. (The lab reports were used as the data source).

Qualifiers:

- * - Estimated maximum possible concentration
- J - Estimated concentration
- JL - The analyte result in the laboratory control sample was out of control limits. The reported concentration should be considered an estimate.
- JR - The relative percent difference result in laboratory control sample associated with the analyte was out of control limits. The reported concentration should be considered an estimate.
- U - Constituent not detected at shown reporting limit
- VE - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

(1) Total dioxins/furans and total cPAHs concentrations were calculated using MTCA toxicity equivalence factors (TEFs) per WAC 173-340-708(8). The 2001 MTCA Concise Explanatory Statement recommends using half the laboratory reporting limit in the TEF calculations for congeners/constituents that were detected in one or more samples at a given site. All dioxins/furans congeners and all cPAH constituents were detected in at least one sediment sample near the Site. Thus, for the purpose of this table, non-detect results in all sediment and soil samples were assumed to equal half of the laboratory reporting limit in the TEF calculations for consistency and conservatism. As a result, some of the on-site soil resilts presented in this table are different than those presented in PIONEER 2021. For instance, the total dioxins/furans soil concentrations in PIONEER 2021 are appropriately and accurately lower than the concentrations in this table because not all congeners were detected at the Site.

(2) The following data reduction rules were used for compound totaling of these constituents: (a) if one or more individual constituent was detected in a sample, the non-detect constituents were assumed to equal one-half of the reporting limit, and (b) if no individual constituents were detected in a sample, the sum of the reporting limits for the individual constituents was used.

(3) Totals calculated are based on the organic carbon normalized values listed in the reports. These values are not used for screening.

(4) According to Table 5 of Greylock 2007, the reporting limits for GS-01 through GS-04 were 370 ug/kg, 360 ug/kg, 330 ug/kg, and 300 ug/kg, respectively. It is possible the lab issued a revised lab report with these lower reporting limits and that the revised lab report was inadvertently excluded from the Greylook 2007 report.

(5) Individual aroclor results were not reported.

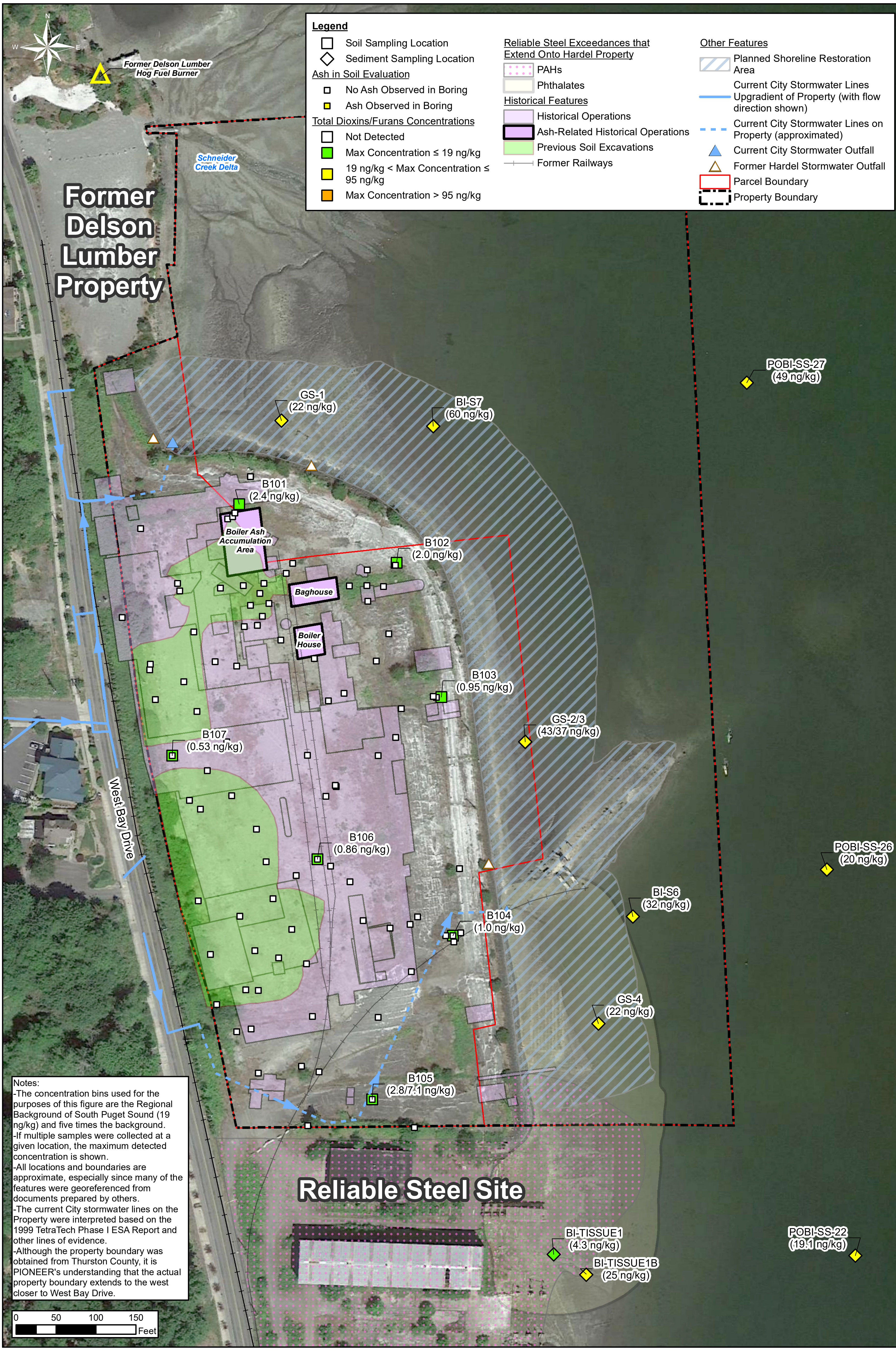
(6) Aroclor 1016 was reported with Aroclor 1242.

(7) No data is presented for benzo[k]fluoranthene. The benzo[b]flouranthene result is the sum of benzo[b,k] totalled.

(8) No data is presented for benzo[k]fluoranthene. The benzo[b]flouranthene result is the sum of benzo[b,j,k] totalled where U=0.

(9) The CA qualifier was not defined in the report.

Figures

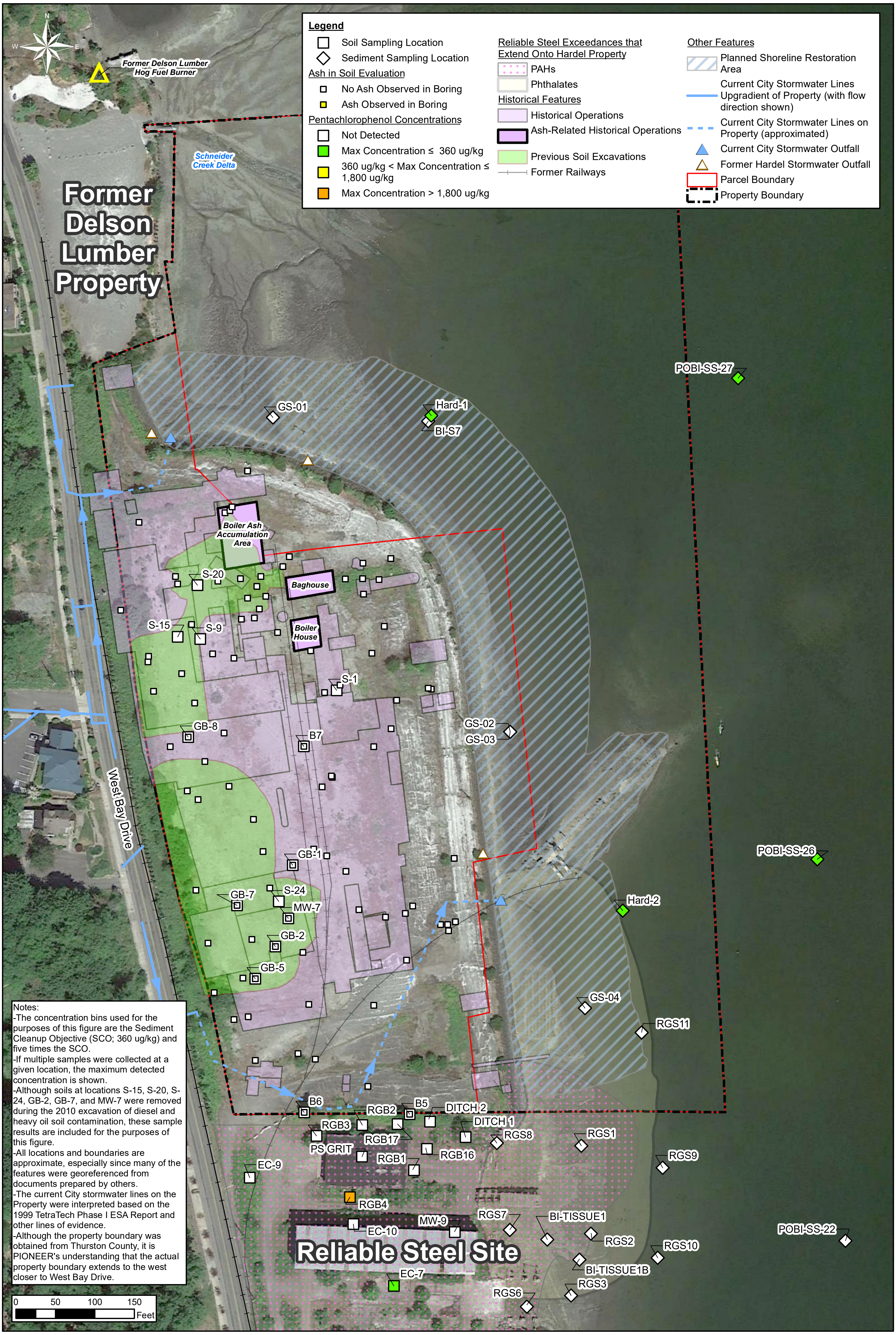


PIONEER TECHNOLOGIES CORPORATION

Total Dioxins/Furans Sediment and Soil Results
Hardel Mutual Plywood Corporation Site

Figure 1

Document Path: \\sec\gis\Projects\Hardel\Maps\2022\Ecy RI Data Gaps\Fig 1_Historical Operations & DF Data.mxd; Author: MK; Date Saved: 10/18/2022

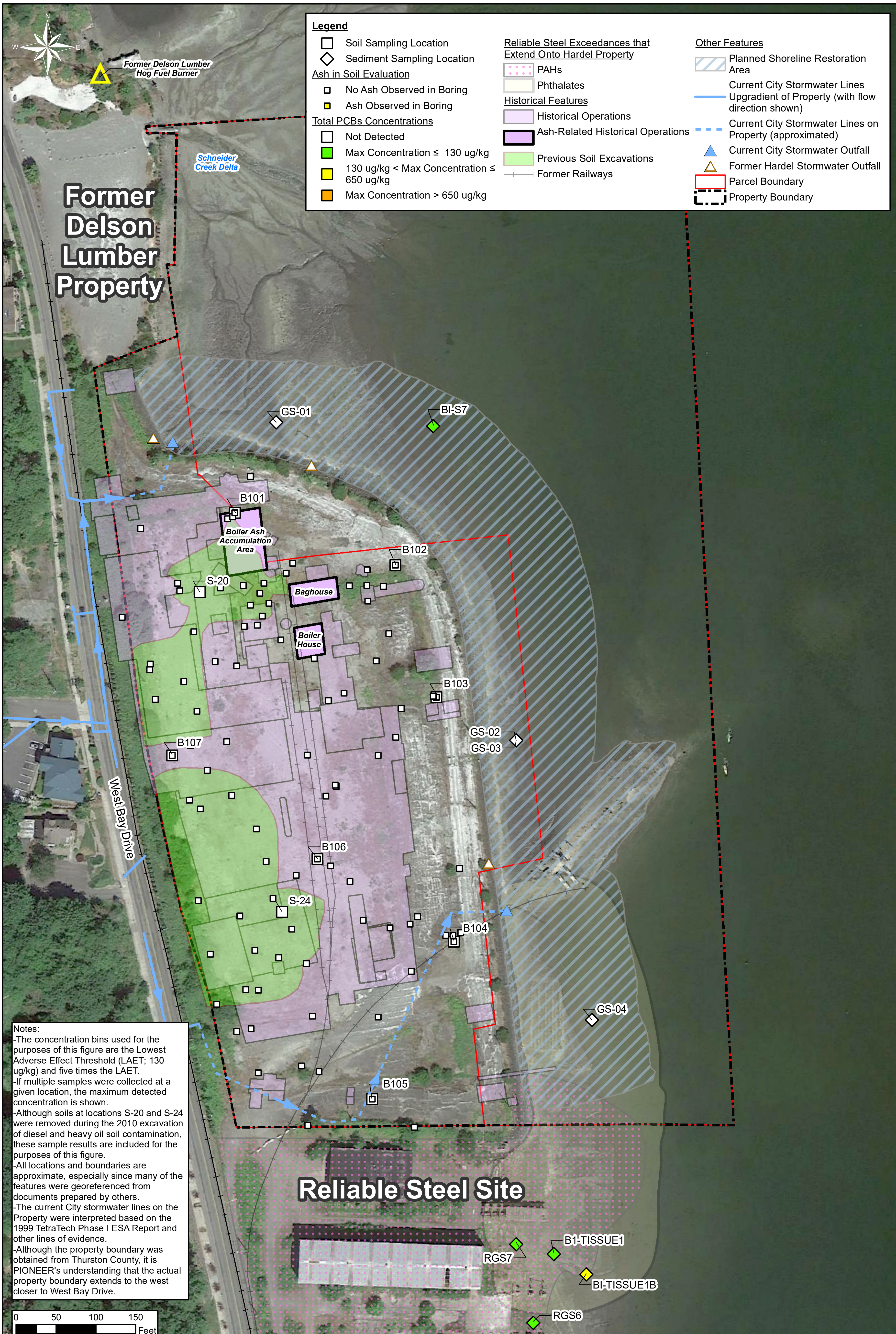


PIONEER TECHNOLOGIES CORPORATION

Pentachlorophenol Sediment and Soil Results
Hardel Mutual Plywood Corporation Site

Figure 2

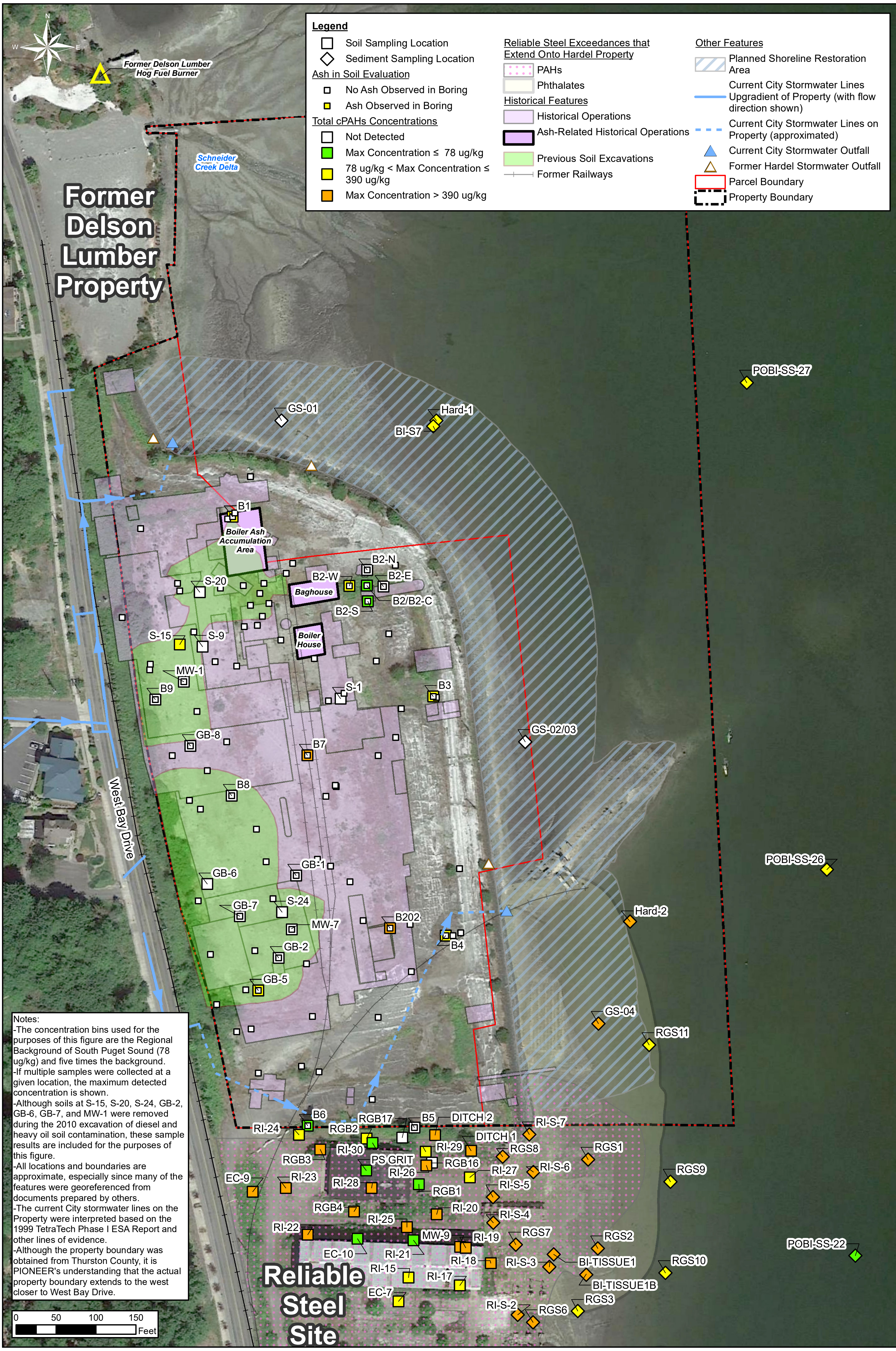
Document Path: G:\Projects\Hardel\Maps\2022\Ecy RI Data Gaps\Fig 3_Historical Operations & Data.mxd; Author: MK; Date Saved: 10/18/2022



PIONEER TECHNOLOGIES CORPORATION

Total PCBs Sediment and Soil Results
Hardel Mutual Plywood Corporation Site

Figure 3



PIONEER TECHNOLOGIES CORPORATION

Total cPAHs Sediment and Soil Results
Hardel Mutual Plywood Corporation Site

Figure 4

Document Path: G:\Projects\Hardel\Maps\2022\Ecy RI Data Gaps\Fig 4_Historical Operations & cPAH Data.mxd; Author: MK; Date Saved: 10/18/2022

Charts

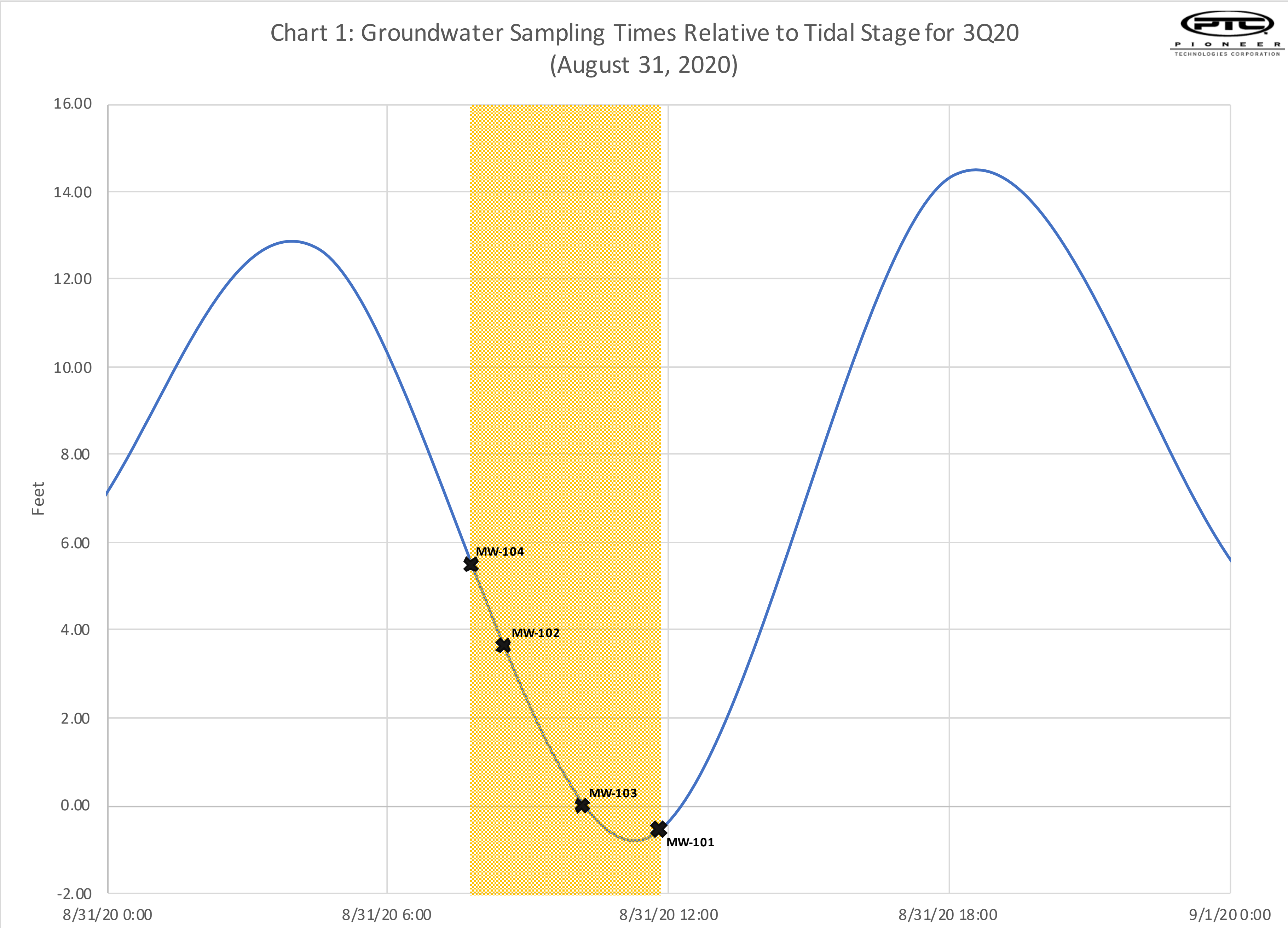


Chart 1: Groundwater Sampling Times Relative to Tidal Stage for 3Q20
(August 31, 2020)
PIONEER
TECHNOLOGIES CORPORATION
Feet
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
MW-104
MW-102
MW-103
MW-101
8/31/20 0:00
8/31/20 6:00
8/31/20 12:00
8/31/20 18:00
9/1/20 0:00

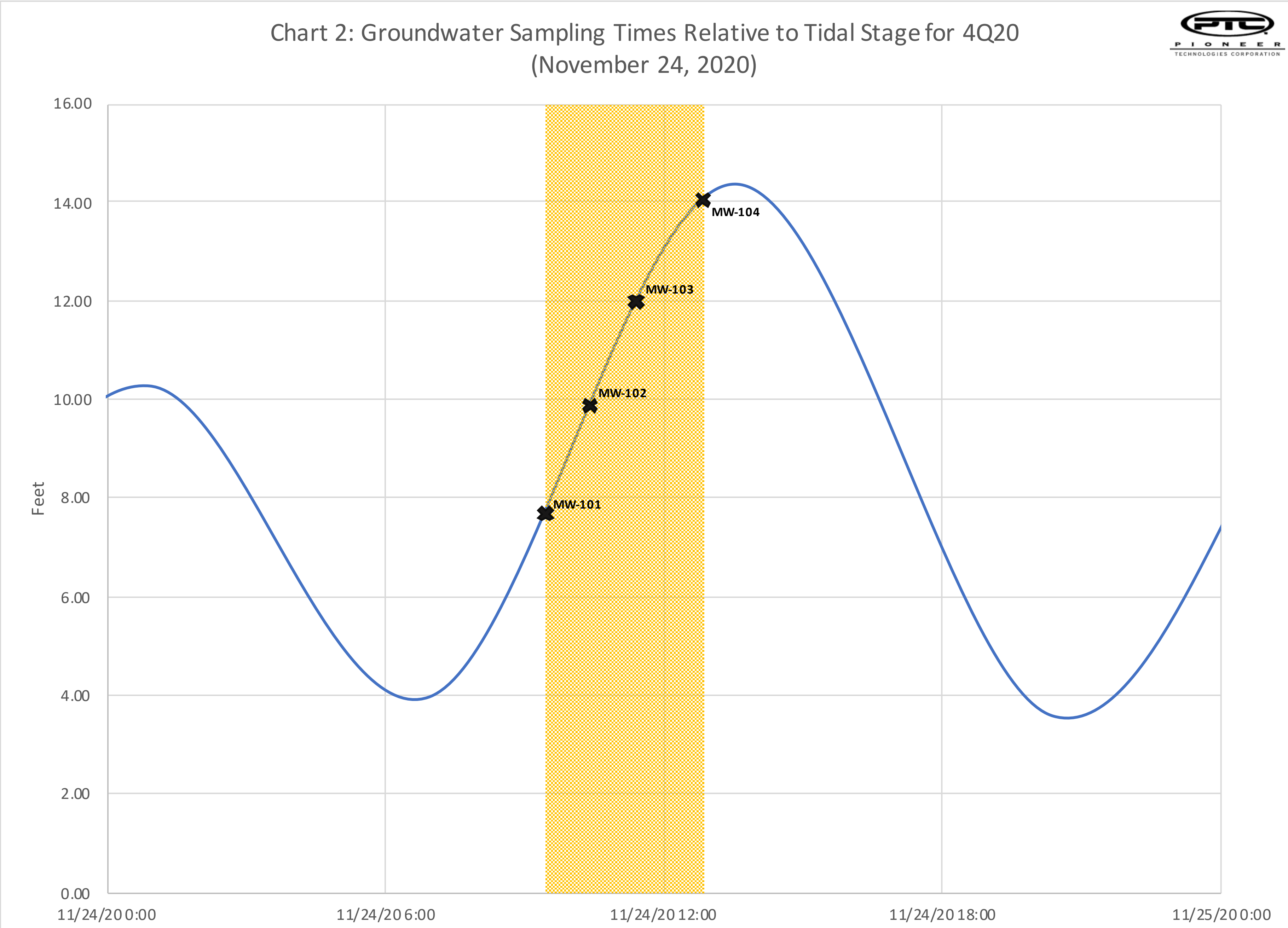


Chart 2: Groundwater Sampling Times Relative to Tidal Stage for 4Q20
(November 24, 2020)
PIONEER
TECHNOLOGIES CORPORATION
Feet
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
11/24/20 0:00
11/24/20 6:00
11/24/20 12:00
11/24/20 18:00
11/25/20 0:00
MW-101
MW-102
MW-103
MW-104

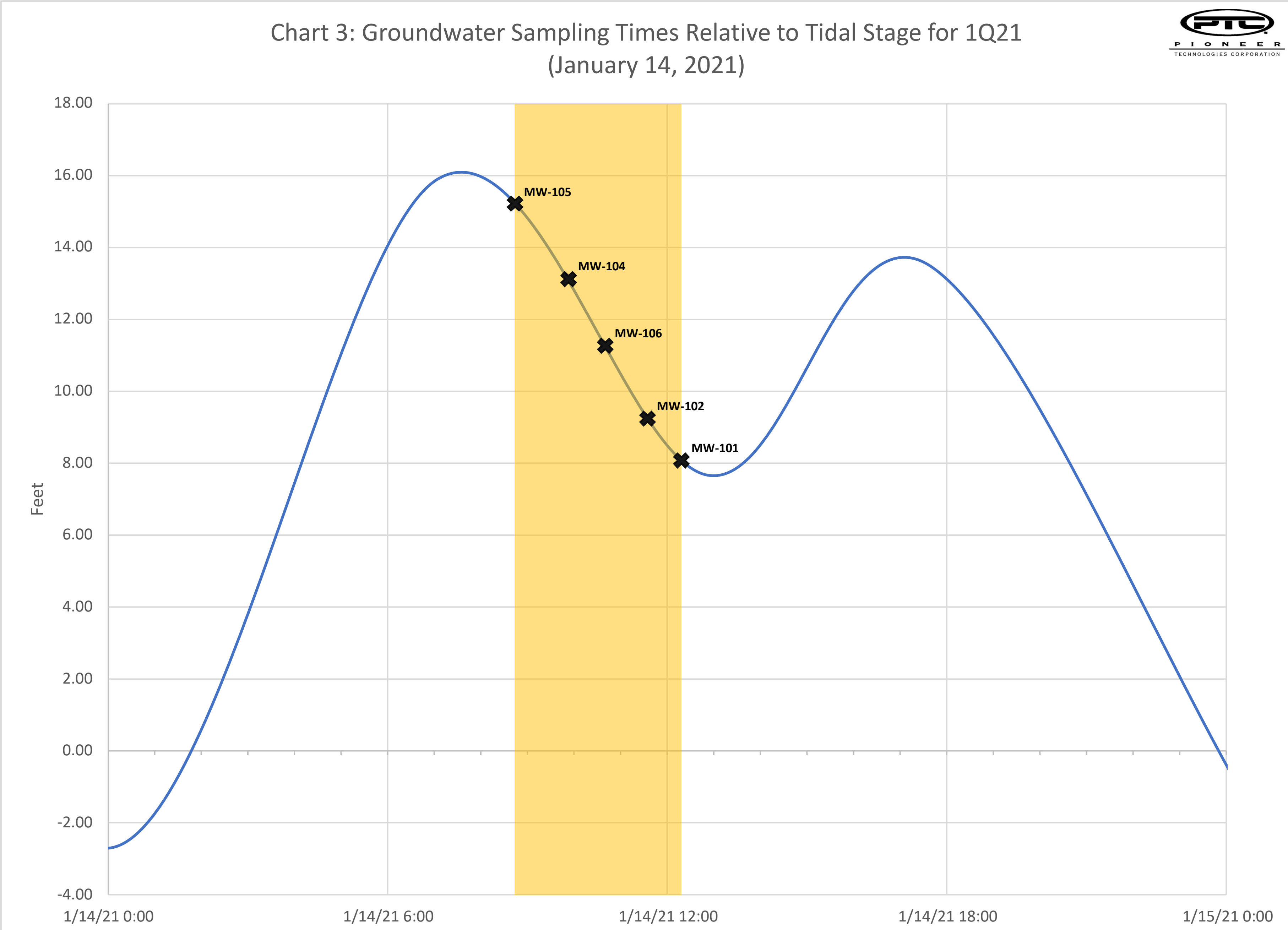


Chart 3: Groundwater Sampling Times Relative to Tidal Stage for 1Q21
(January 14, 2021)
PIONEER
TECHNOLOGIES CORPORATION
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
Feet
MW-105
MW-104
MW-106
MW-102
MW-101
1/14/21 0:00
1/14/21 6:00
1/14/21 12:00
1/14/21 18:00
1/15/21 0:00

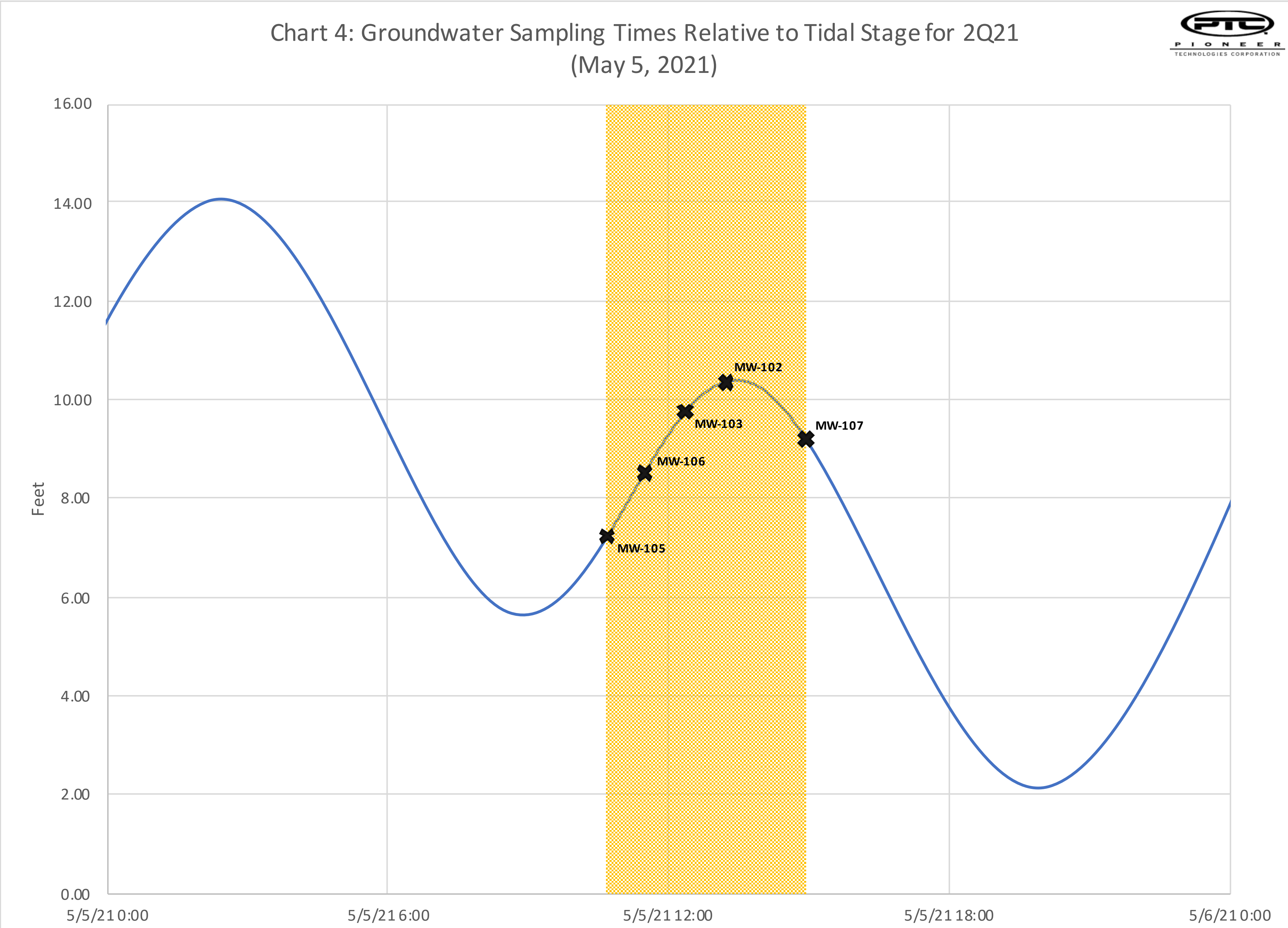


Chart 4: Groundwater Sampling Times Relative to Tidal Stage for 2Q21
(May 5, 2021)
PTC
PIONEER
TECHNOLOGIES CORPORATION
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Feet
MW-102
MW-103
MW-107
MW-106
MW-105
5/5/21 0:00
5/5/21 6:00
5/5/21 12:00
5/5/21 18:00
5/6/21 0:00

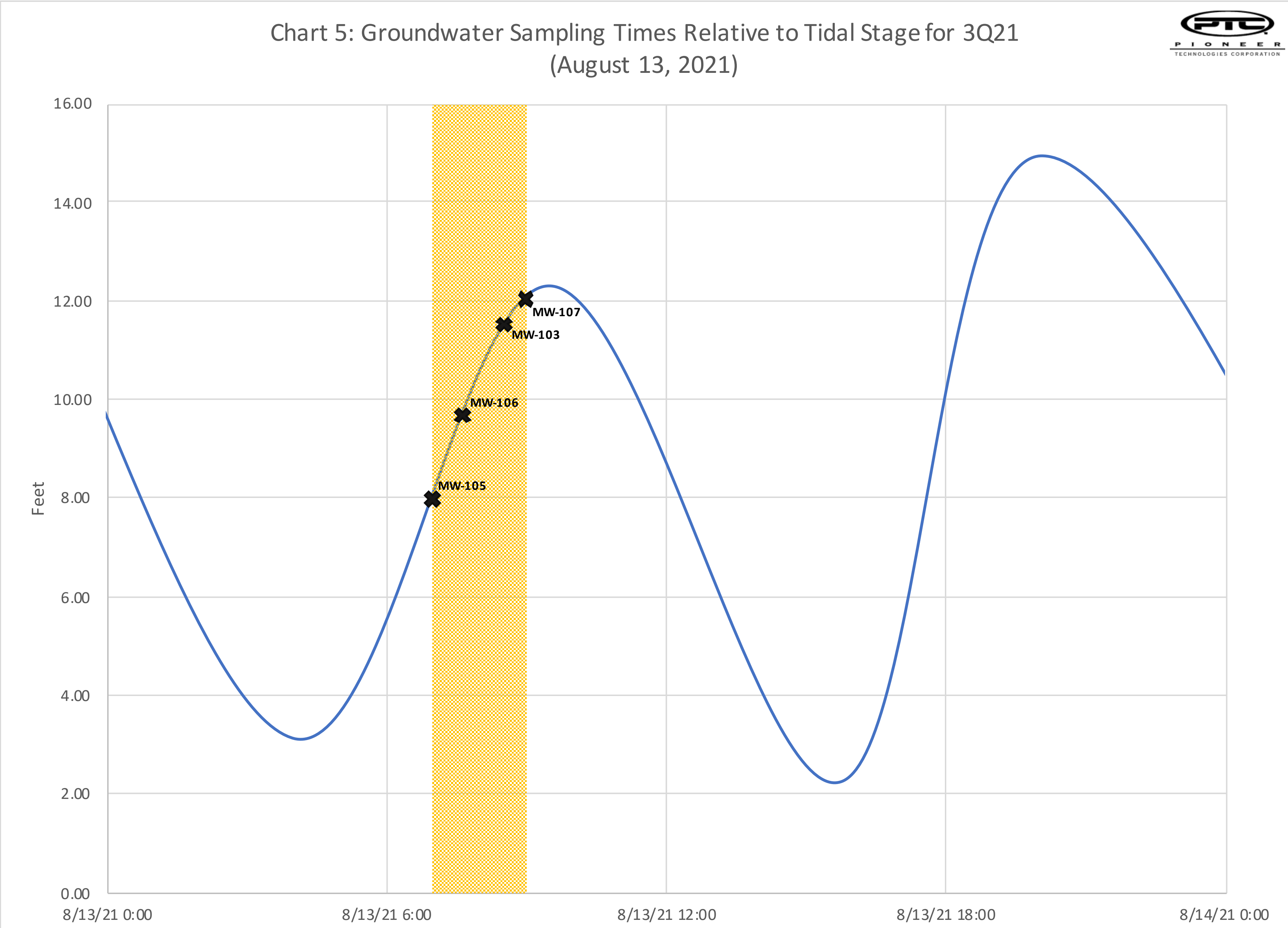


Chart 5: Groundwater Sampling Times Relative to Tidal Stage for 3Q21
(August 13, 2021)
PTC
PIONEER
TECHNOLOGIES CORPORATION
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Feet
MW-107
MW-103
MW-106
MW-105
8/13/21 0:00
8/13/21 6:00
8/13/21 12:00
8/13/21 18:00
8/14/21 0:00

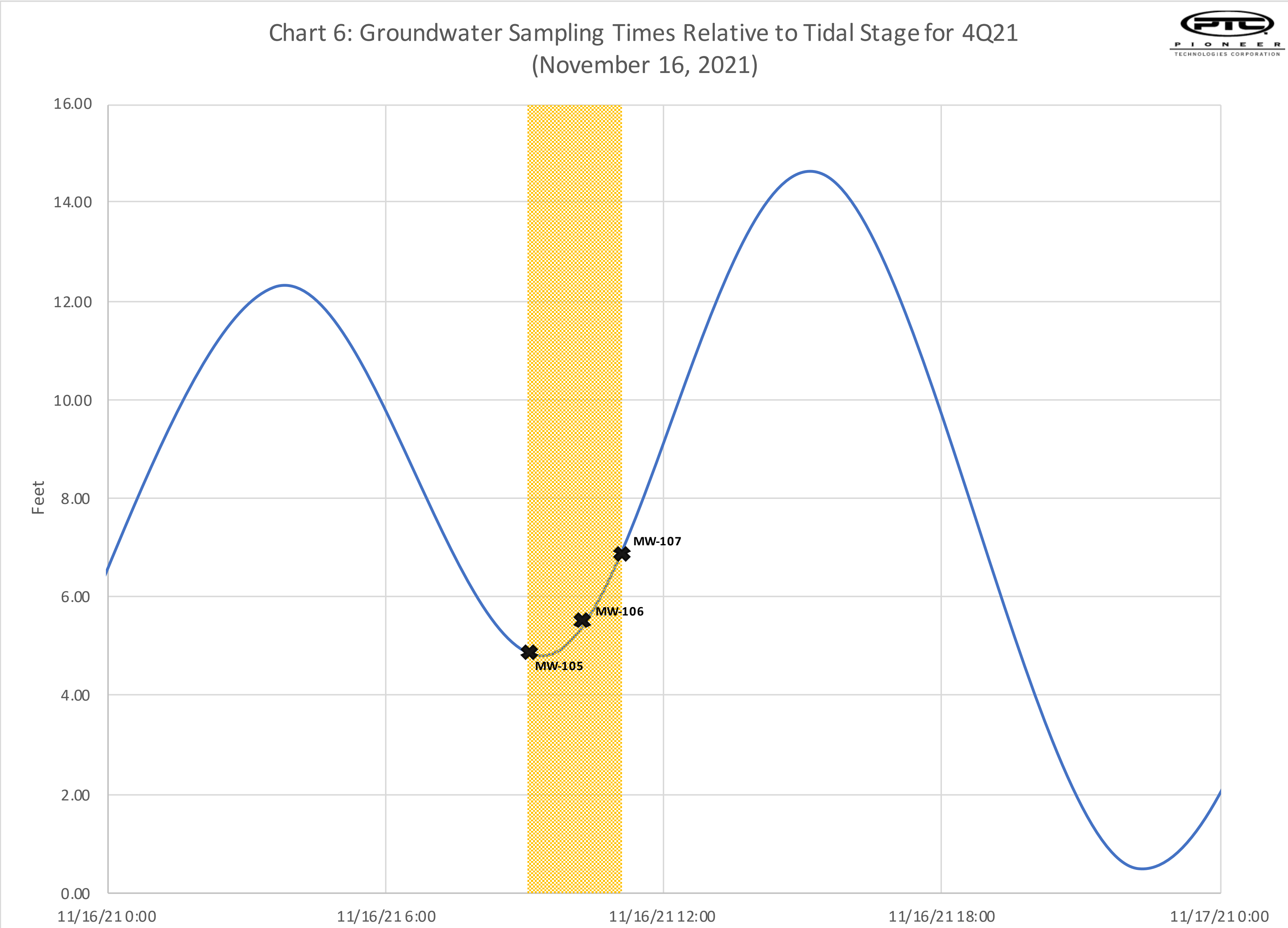


Chart 6: Groundwater Sampling Times Relative to Tidal Stage for 4Q21
(November 16, 2021)
PIONEER
TECHNOLOGIES CORPORATION
Feet
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
11/16/21 0:00
11/16/21 6:00
11/16/21 12:00
11/16/21 18:00
11/17/21 0:00
MW-105
MW-106
MW-107

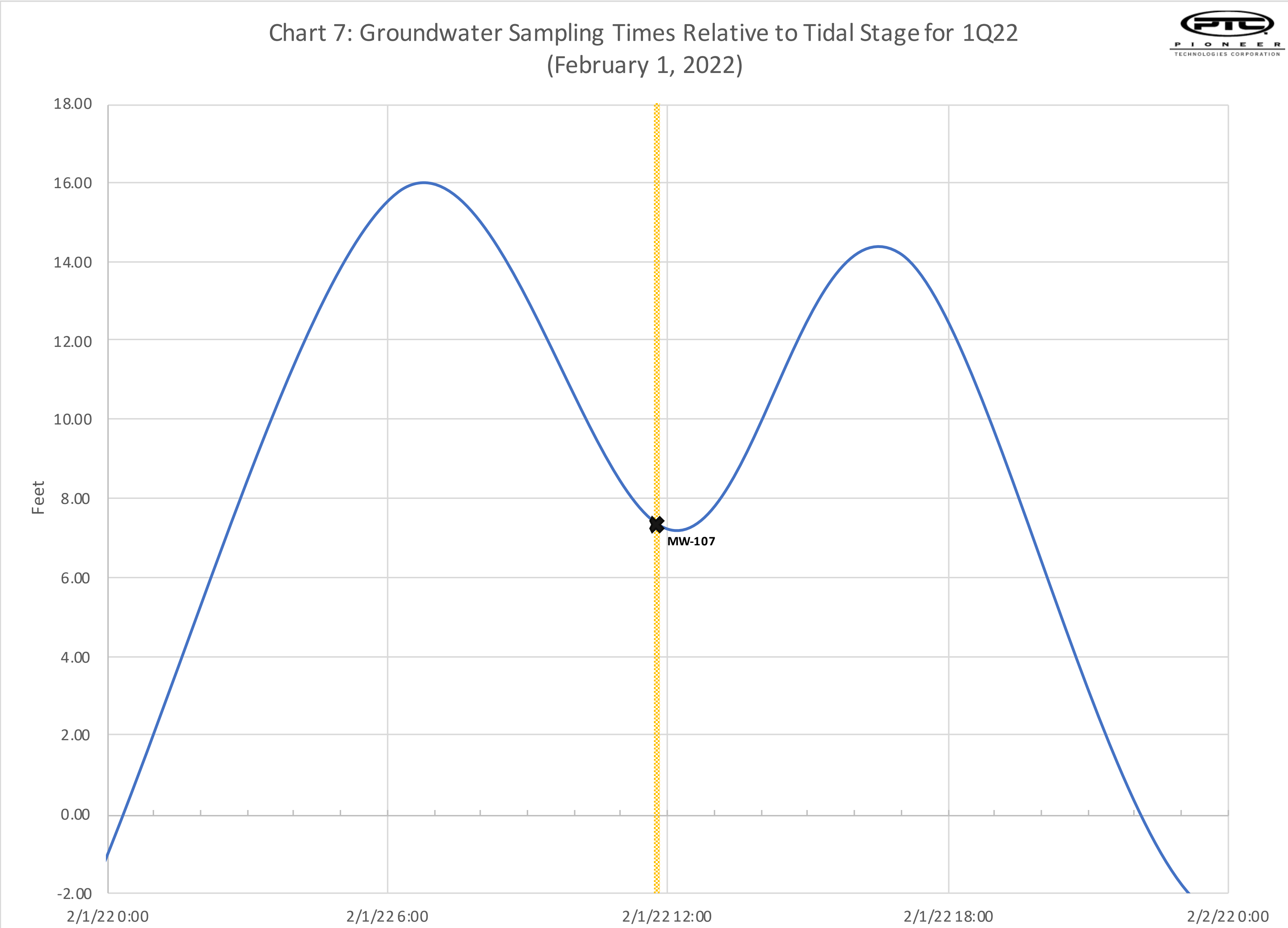


Chart 7: Groundwater Sampling Times Relative to Tidal Stage for 1Q22
(February 1, 2022)
PTC
PIONEER
TECHNOLOGIES CORPORATION
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
Feet
MW-107
2/1/22 0:00
2/1/22 6:00
2/1/22 12:00
2/1/22 18:00
2/2/22 0:00

Appendix A

Photographic Log

Table of Contents

Photographic Log

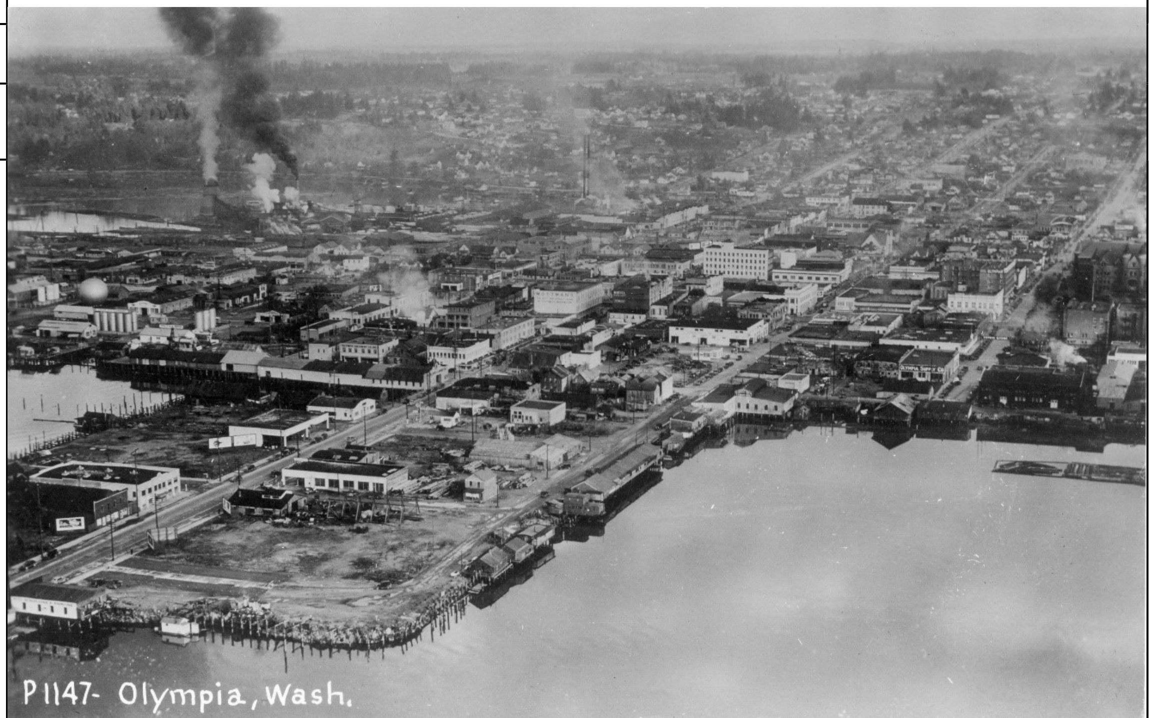
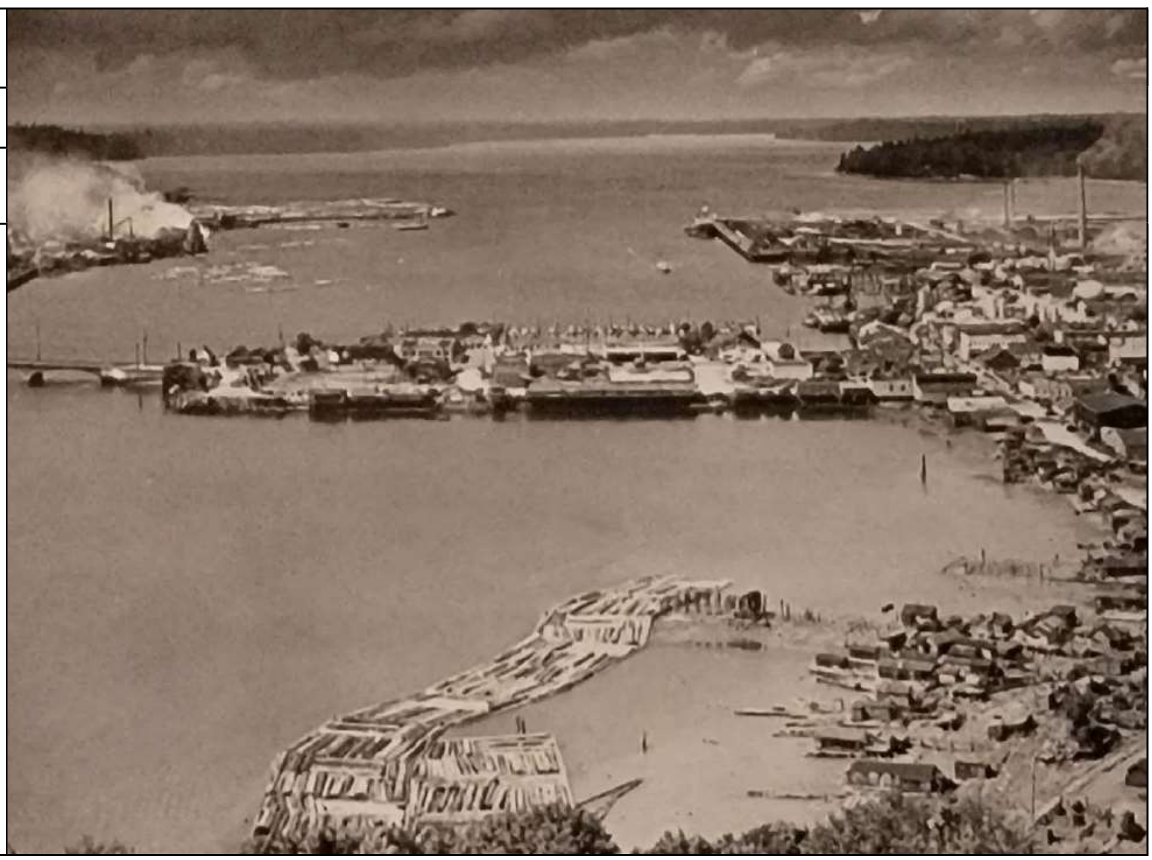
Photo No. 1: Industrial Shoreline Example #1	
Date: Unknown	
Direction Photo Taken: Southeast	
Description: Downtown Olympia shoreline. Note industrial nature of shoreline, number of buildings cantilevered over water, and various emissions.	

Photo No. 2: Industrial Shoreline Example #2	
Date: 1939	
Direction Photo Taken: North	
Description: West Bay shoreline prior to construction of 5th Avenue Dam in 1951. Note industrial nature of shoreline, number of buildings cantilevered over water, Solid Wood HFB emissions (upper left portion of photo), and various emissions on Port Peninsula (upper right portion of photo).	

Photographic Log

Photo No. 3: Historical Port Peninsula Emissions Example	
Date: Unknown	
Direction Photo Taken: East	
Description: Various emissions on Port Peninsula. It would be expected that many of these emissions were from burning salt-laden wood waste.	

Photo No. 4: Historical Emissions Around West Bay Example	
Date: 1949	
Direction Photo Taken: South	
Description: Various emissions surrounding West Bay. Note substantial emissions on Port Peninsula (center left portion of photo), Solid Wood HFB (center right portion of photo), and minimal emissions from the side-by-side Hardel smokestacks (lower right portion of photo).	

Photographic Log

Photo No. 5: More Recent Emissions Near West Bay #1	
Date: 1965	
Direction Photo Taken: South	
Description: Various emissions surrounding West Bay in 1965. Note emissions on Port Peninsula (left portion of photo) traveling to the west side of West Bay (right portion of photo), where the Hardel Site is located.	

Photo No. 6: More Recent Emissions Near West Bay #2	
Date: 1970	
Direction Photo Taken: Southeast	
Description: Various emissions surrounding West Bay in 1970. Note Delson Lumber HFB (lower left portion of photo), HFB and other emission sources on Port Peninsula (upper portion of photo), and minimal emissions from the side-by-side Hardel smokestacks (lower center portion of photo).	

Photographic Log

Photo No. 7: Delson Lumber HFB #1

Date: Unknown

Direction Photo Taken: Northeast

Description: Emissions from Delson Lumber HFB (center portion of photo). It is expected that this HFB burned salt-laden wood waste.

Photo No. 8: Delson Lumber HFB #2

Date: 1968

Direction Photo Taken: Not applicable

Description: Emissions from Delson Lumber HFB (upper left portion of photo). Note the substantially larger quantity of Delson Lumber HFB emissions compared to emissions from the side-by-side Hardel smokestacks (center left portion of photo).

Photographic Log

Photo No. 9: Butane-Fired Hardel Boiler

Date: Circa 1953-1958

Direction Photo Taken: Not applicable

Description:
Posing before the Hardel butane-fired boiler following installation. Note the side-by-side smokestacks extending through the roof of the boiler house (upper center potion of photo).

Photo No. 10: Butane Storage Tank

Date: Circa 1953-1958

Direction Photo Taken: Unknown

Description:
Hardel butane storage tank following installation of butane-fired boiler.

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Photographic Log

Photo No. 11: Early Hardel Operations

Date: Circa 1950

Direction Photo Taken: Northwest

Description:
Hardel Plant circa 1950. Note minimal emissions from side-by-side smokestacks (center right portion of photo), emissions form Delson Lumber HFB (upper right portion of photo), and logway (center right portion of photo).

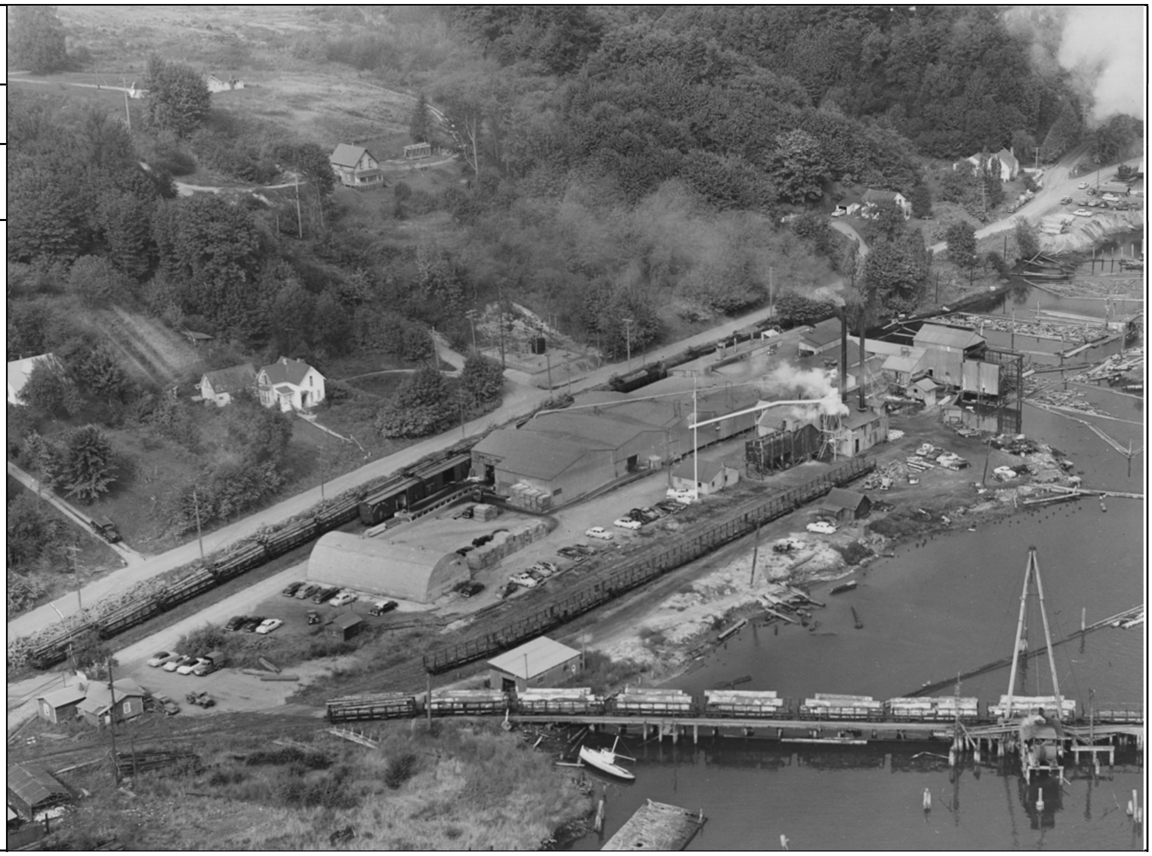
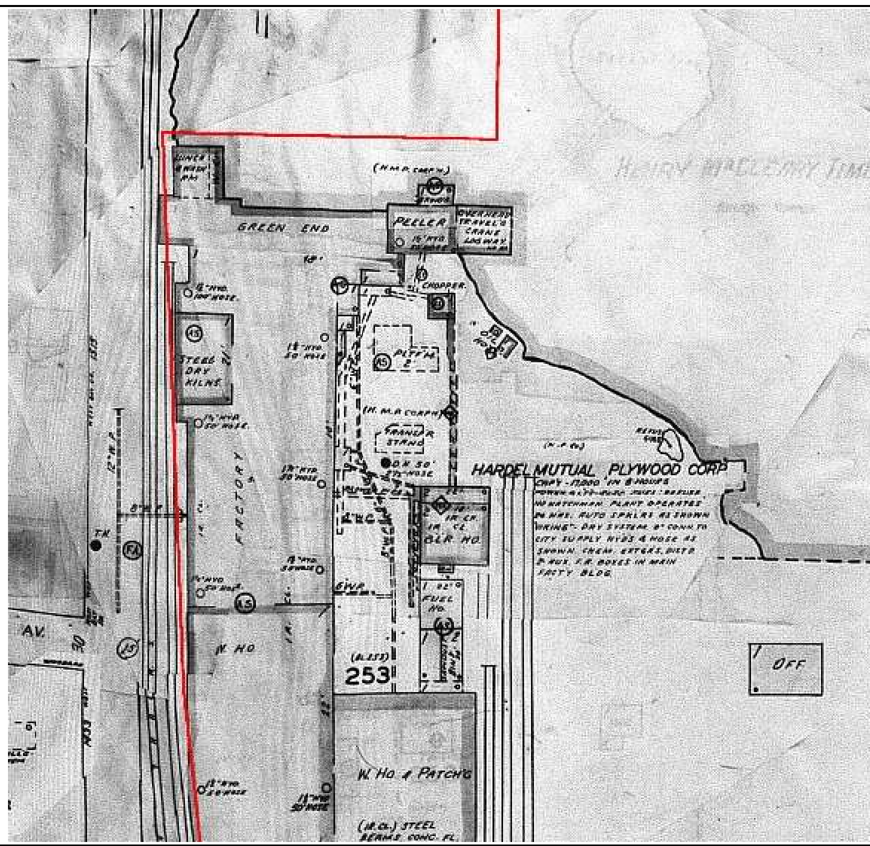


Photo No. 12: 1968 Sanborn Map

Date: 1968

Direction Photo Taken: Not applicable

Description:
Portion of 1968 Sanborn map. Note Boiler House (“BLR. HO.” in center of photo), Fuel House (“FUEL HO.” immediately beneath the Boiler House in the photo), and the logway (upper center portion of photo).



Attachment 2

Work Plan to Address Ecology's RI Data Gaps

Hardel Mutual Plywood Corporation Site
1210 West Bay Drive NW
Olympia, Washington
VCP Project ID SW1757
Formerly Agreed Order DE 4108
Cleanup Site ID 3704

Prepared for:

West Bay Development Group, LLC
8512 Canyon Road East, Suite 101
Puyallup, Washington 98371

Prepared by:

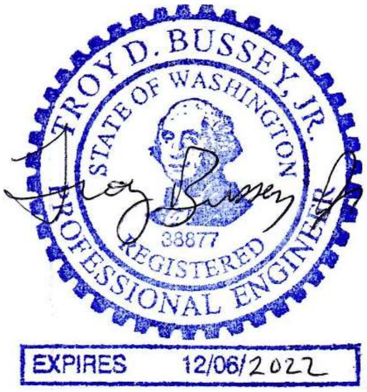
PIONEER TECHNOLOGIES CORPORATION

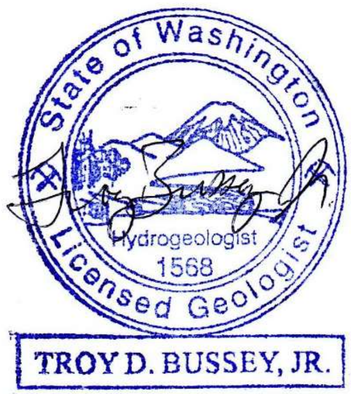
5205 Corporate Center Ct. SE, Suite A
Olympia, Washington 98503
Phone: 360.570.1700
Fax: 360.570.1777
www.uspioneer.com

October 2022

Professional Certification

This document was prepared under my direction. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I hereby certify that I was in responsible charge of the work performed for this document.





October 25, 2022

Date

Troy D. Bussey Jr.
Principal Engineer
PIONEER Technologies Corporation
Washington P.E. Registration No. 38877
Washington L.G. and L.HG. Registration No. 1568

Table of Contents

Figures

Tables

Appendices

List of Acronyms

Acronym	Explanation
bgs	Below ground surface
CFR	Code of Federal Regulations
Dioxins/Furans	Chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans
Ecology	Washington State Department of Ecology
EDB	Ethylene dibromide (or 1,2-dibromoethane)
ESA	Environmental Site Assessment
GW	Groundwater
GWM	Groundwater Monitoring
Hardel	Hardel Mutual Plywood Corporation
LNAPL	Light Non-Aqueous Phase Liquid
MTCA	Model Toxics Control Act
MW	Monitoring Well
NAVD88	North American Vertical Datum of 1988
NTU	Nephelometric Turbidity Unit
PCE	Tetrachloroethylene
PID	Photoionization Detector
PIONEER	PIONEER Technologies Corporation
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plan
QC	Quality Control
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
Site	Hardel Mutual Plywood Corporation Site
SL	Screening Level
SVP	Soil Vapor Probe
USEPA	United States Environmental Protection Agency
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compound
WAC	Washington Administrative Code
Work Plan	Work Plan to Address Ecology's RI Data Gaps

SECTION 1: INTRODUCTION

The purpose of this Work Plan is to present the plan for implementing investigation activities to address the remaining Model Toxics Control Act (MTCA) remedial investigation (RI) data gaps identified by the Washington State Department of Ecology (Ecology) for the Hardel Mutual Plywood Corporation (Hardel) Site (Site). The three remaining RI data were verbally identified by Ecology's Nick Acklam during a Voluntary Cleanup Program (VCP) technical consultation meeting with Troy Bussey of PIONEER Technologies Corporation (PIONEER) and Kim Seely of Coastline Law Group on January 11, 2022. Even though the Site was successfully investigated and remediated to Ecology's satisfaction under an Agreed Order (AO) between Ecology and Hardel, supplementary RI data gap activities have been conducted since June 2020 to further evaluate the Site's suitability for the planned West Bay Yards brownfield redevelopment project. RI data gap investigation activities and results to date as well as Site background information are presented in PIONEER's RI Data Gap Report (PIONEER 2021b) and RI Data Gap Report Addendum #1 (PIONEER 2022a). MTCA work at the Site is currently being conducted under the VCP, pursuant to Washington Administrative Code (WAC) 173-340-515. The location of the property associated with the Site is shown on Figure 1.

SECTION 2: OBJECTIVES AND BACKGROUND

2.1 Data Gap Objectives

PIONEER developed the following objectives to address the three remaining RI data gaps verbally communicated by Ecology's Nick Acklam during a VCP technical consultation meeting on January 11, 2022:

- Data Gap #1: Further evaluate the source, nature, and extent of the slight groundwater (GW) screening level (SL) exceedances in the B5 and B6 direct-push GW samples collected on the border between the former Hardel property and the Reliable Steel property.
- Data Gap #2: Further investigate the potential for ash in soil near the former Boiler House, former Boiler Ash Accumulation Area, and former Baghouse, and collect additional soil samples for chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans (dioxins/furans) analyses in these locations.
- Data Gap #3: Refine areas where methane soil gas concentrations exceed 30% to inform the locations for long-term monitoring and institutional control requirements associated with methane.

2.2 Key Background Information

A brief summary of key background information for each of Ecology's three RI data gaps is presented in this section.

2.2.1 Data Gap #1

To address a January 11, 2022 verbal comment from Ecology's Nick Acklam, additional investigation activities will be conducted to further evaluate the source, nature, and extent of the slight GW SL exceedances in the B5 and B6 direct-push GW samples. The existing lines of evidence indicate the slight B5 and B6 GW exceedances are attributable to a release on the Reliable Steel site as summarized in the following paragraph.

Known releases on the south-adjoining Reliable Steel property were identified as a Recognized Environmental Condition in the Phase I Environmental Site Assessment (ESA; PIONEER 2020a). Borings B5 and B6 were specifically positioned on the border between the former Hardel property and the Reliable Steel property to evaluate the potential for transport of these Reliable Steel releases onto the former Hardel property (PIONEER 2020b). There were no soil SL exceedances in the soil samples collected from B5 and B6 during the Phase II ESA in June 2020 (PIONEER 2020b, 2021b). Direct-push GW samples were also collected from temporary GW monitoring wells (MWs) installed in the B5 and B6 borings in June 2020. The only GW SL exceedance in the B5 GW sample was a tetrachloroethylene (PCE) concentration of 3.4 ug/L (the SL is 2.9 ug/L). The only GW SL exceedances in the B6 GW sample were an ethylene dibromide (EDB) concentration of 0.11 ug/L (the SL is 0.05 ug/L) and an arsenic concentration of 9.8 ug/L (the SL is 8 ug/L). These slight PCE, EDB, and arsenic GW SL exceedances in the B5 and B6 borings along the boundary of the south-adjoining Reliable Steel property are attributable to the Reliable Steel site for the following reasons:

- The Reliable Steel building located immediately south of sampling locations B5 and B6 is a likely source of the B5 and B6 GW SL exceedances since it was historically used as a paint shop (GeoEngineers 2013). In addition, there has been obvious trespasser use inside the remaining paint shop building shell for many years, and products containing PCE, EDB, and/or arsenic could have been used and released by trespassers.
- The GW flow direction near the former paint shop and the B5 and B6 sampling locations is to the northeast/east towards the Hardel Site (GeoEngineers 2013).
- Potential Reliable Steel releases in the vicinity of the former paint shop have not been adequately characterized (e.g., no GW samples were collected within or downgradient of the former paint shop, soil samples collected within the former paint shop were not analyzed for volatile organic compounds [VOCs; GeoEngineers 2013]).
- The B5 and B6 GW samples were specifically positioned on the Reliable Steel property line in order to assess potential GW impacts migrating from Reliable Steel (e.g., former paint shop).
- There were no historical Hardel operations proximate to sampling locations B5 and B6 (TetraTech 1999; PIONEER 2020a). In addition, there were no PCE, EDB, or arsenic detections in the co-located B5 and B6 soil samples, with the exception of an arsenic detection below the Puget Sound natural background soil concentration (Ecology 1994) in the B5 soil sample.

2.2.2 Data Gap #2

To address a January 11, 2022 verbal comment from Ecology's Nick Acklam, additional soil sampling will be conducted to further investigate if ash or elevated dioxins/furans soil concentrations are present near the three ash-related historical operations: the former Boiler House, the former Boiler Ash Accumulation Area, and the former Baghouse. This data gap is associated with Ecology's comment that the former Hardel boiler may have burned salt-laden wood waste, and therefore may have generated dioxins/furans in the boiler ash. However, as discussed in PIONEER's responses to Nick Acklam's January 11, 2022 verbal comments (PIONEER 2022b), existing evidence indicates that the former Hardel boiler may not have burned any salt-laden wood waste. Further, as discussed in PIONEER's responses, ash has not been observed in any of the 92 existing Site soil boring logs, including soil borings located within or proximate to the footprints of the former Boiler House, the former Boiler Ash Accumulation Area, and the former Baghouse. In addition, the dioxins/furans soil concentrations in the seven existing on-site soil samples are extremely low and not indicative of a dioxins/furans release. For instance, the maximum dioxins/furans concentration in upland Site soil was at B105, with field duplicate concentrations of 2.8 ng/kg and 7.1 ng/kg. Thus, these additional investigation activities are expected to confirm the lack of ash and lack of elevated dioxins/furans concentrations in upland Site soil.

2.2.3 Data Gap #3

During the 2020 Phase II ESA, PIONEER installed and sampled two soil vapor probes (SVPs; B10 and B11) (see Figure 4). Methane soil gas concentrations (i.e., less than 30%) and pressure differentials (i.e., less than 500 pascals) in these two SVPs indicated that no further action was necessary regarding a potential methane hazard in accordance with ASTM International Designation E2993-16 (Standard Guide for Evaluating Potential Methane Hazards as a Result of Methane in the Vadose Zone). However, additional methane investigation activities were conducted because of the amount of subsurface wood debris at the Site, the relatively high methane concentration in the B11 SVP (23%), and the limited nature of the 2020 methane investigation activities (PIONEER 2020b). In accordance with the amended work plan (PIONEER 2021a, 2021c), 18 additional SVPs (SVP1 through SVP7, SVP9 through SVP12, SVP14, and SVP16 through SVP21) were installed in October 2021, and methane sampling events were conducted in October and November 2021.[1] Field measurements of the pressure differentials and methane, oxygen, and carbon dioxide soil gas concentrations were obtained from all 18 installed SVPs during at least two different sampling events. In addition, soil gas samples were collected from the three SVPs with the highest field methane concentrations and submitted to Fremont Analytical for analysis of methane, oxygen, carbon dioxide, and nitrogen by United States Environmental Protection Agency (USEPA) Method 3C.

The key methane soil gas results were (PIONEER 2022a):

- The maximum methane soil gas concentrations in SVP6, SVP7, SVP11, and SVP19 exceeded 30%.
- Methane soil gas concentrations in SVP6, SVP7, and SVP19 increased as the amount of SVP purging increased. By contrast, methane soil gas concentrations in SVP11 dramatically decreased as the amount of SVP purging increased.
- The methane concentrations in the SVP6, SVP7, and SVP19 samples analyzed by the laboratory replicated the SVP6, SVP7, and SVP19 field measurements.
- The maximum methane soil gas concentrations in SVP1 through SVP5, SVP9, SVP10, SVP12, SVP14, SVP16 through SVP18, SVP20, and SVP21 were less than 30%. However, the methane soil gas concentrations at SVP9, SVP16, and SVP18 have the potential to exceed 30% in the future since concentrations increased as the amount of SVP purging increased, and the final concentrations were near 30%.

Although methane soil gas concentrations at seven locations either exceeded 30% or have the potential to exceed 30% in the future (i.e., SVP6, SVP7, SVP9, SVP11, SVP16, SVP18, and SVP19 - collectively referred to as conceptual areas with methane soil gas concentrations of potential concern in Figure 4 of this Work Plan), the potential for subsurface methane to cause an indoor air hazard at this Site is low for several key reasons. First, there are no current buildings on the Site. Second, the proposed development includes the addition of clean soil fill material, which will raise the ground surface of the upland area from the current elevations of 13 to 16 feet North American Vertical Datum of 1988 (NAVD88) to a final elevation of 17 feet NAVD88 (PIONEER 2021b). For instance, approximately two feet of clean fill will be added during the planned development in the vicinity of the four SVPs with maximum methane soil gas concentrations exceeding 30% (PIONEER 2021b). This added soil will provide additional attenuation of methane between subsurface soil gas and indoor air. Third, the only indoor air space in the proposed development below an elevation of 26 feet NAVD88 will be a large subsurface parking garage underneath the buildings. In other words, there is a limited indoor air space for potential methane transport. Finally, in accordance with building, mechanical, and fire code requirements, the subsurface parking garage will have a mechanical ventilation system that satisfies code-required air exchange

[1] In accordance with the work plan (PIONEER 2021a), SVP8, SVP13, and SVP15 were not installed because the depths to GW at these proposed locations were less than three feet below ground surface (bgs).

requirements for an enclosed structure and satisfies code-required vertical and horizontal separation distances between the exhaust and fresh air intakes.[2] In other words, the ventilation system will prevent methane from accumulating within indoor air.

Even though the potential for an indoor air methane hazard is low, additional methane investigation activities and methane mitigation measures were recommended (in consultation with Ecology) to eliminate this potential pathway (PIONEER 2022a). Additional methane soil gas investigation activities were recommended to refine the areas where methane soil gas concentrations exceed 30%, and therefore define the areas where specific components of the MTCA methane remedy (i.e., long-term methane indoor air monitoring and institutional control requirements) would apply. The recommended methane mitigation measures are (1) implementing engineering controls for worker safety during all intrusive subsurface work, (2) installing a passive convertible venting system under the proposed parking garage, (3) installing an impervious vapor barrier under the parking garage between the passive convertible venting system and the garage slab, and (4) collecting indoor air samples following garage construction. During the VCP technical consultation meeting on January 11, 2022, Nick Acklam of Ecology indicated he was supportive of conducting additional methane soil gas investigation activities and the aforementioned recommended mitigation measures.

[2] Personal correspondence between Josh Gobel of Thomas Architecture Studios and Troy Bussey of PIONEER.

SECTION 3: SAMPLING AND ANALYSIS PLAN

The purpose of this sampling and analysis plan (SAP) is to present the methodology for collecting and analyzing samples pursuant to this Work Plan in accordance with WAC 173-340-820 and applicable components of Ecology guidance (Ecology 1995). Typical background contents of a stand-alone SAP are not repeated if included elsewhere in this Work Plan.

3.1 Sampling Design for Data Gaps

A sampling design was developed in order to address the three data gaps summarized in Section 2. The sampling activities, key sampling details, anticipated number of samples, and the constituents to be analyzed for each of the three sampling activities are presented in Table 1. The proposed sampling locations associated with Data Gaps #1 through #3 are shown on Figures 2 through 4, respectively.[3]

3.2 Investigation Roles and Responsibilities

The project team for implementing this SAP includes representatives from PIONEER, Holocene Drilling, Libby Environmental, and Pace Analytical. The specific roles and responsibilities that are anticipated for key personnel involved in this investigation project are summarized in Table 2.

3.3 Pre-Mobilization Tasks

Before the commencement of field work, PIONEER will:

- Subcontract and coordinate work with Holocene Drilling.
- Coordinate with West Bay Development Group, LLC about the proposed fieldwork schedule.
- Complete health and safety preparation tasks.
- Complete the public utility locate (i.e., call 811).
- Coordinate with the laboratories regarding the key elements of the SAP / Quality Assurance Project Plan (QAPP).
- Obtain all necessary equipment and supplies.

Before advancing soil borings or installing MWs, Holocene Drilling will ensure that applicable notices of intent and associated fees are submitted to Ecology's Water Resources Program.

3.4 Field Investigation Procedures

3.4.1 Drilling and Soil Sampling

A driller licensed in Washington State per Chapter 173-162 WAC will complete all drilling activities (e.g., advancing borings and installing MW108 and MW109 for Data Gap #1, advancing borings B301 through B305 for Data Gap #2, and advancing borings and installing SVP22 through SVP41 for Data Gap #3). Soil borings will be advanced using a direct-push, hollow stem auger, or similar rig. With the exception of borings being converted to SVPs, continuous sample cores will be collected from each boring using a

[3] Actual locations will be adjusted as necessary in the field based on utilities, obstructions, access, or other field considerations.

split-spoon sampler, dual tube sampler, or similar. Sample cores will be collected from up to three SVPs to verify GW depths prior to SVP installation; the remaining seven SVPs will be blind drilled. Once all soil samples have been collected from a given soil boring, the driller will decommission the soil boring in accordance with Chapter 173-160 WAC (unless the boring is being converted to a MW or SVP).

PIONEER will examine and classify sample cores in accordance with the Unified Soil Classification System, and will note any visual or olfactory observations associated with potential contamination. PIONEER will use a calibrated photoionization detector (PID) equipped with a 10.6 eV lamp to assess potential VOC impacts in the sample cores. Soil sample interval expectations and constituents to be analyzed are presented in Table 1. Key details about the laboratory analyses and sample containers are included in Section 3.5. PIONEER field personnel will log borehole lithology, and record drilling and soil sampling activities using the forms included in Appendix A.

3.4.2 MW Installation and Development

A licensed Washington driller will install permanent MWs (i.e., MW108 and MW109) in accordance with WAC 173-160 Part II using a direct-push, hollow-stem auger, or similar drill rig. The borings for MW108 and MW109 will be advanced approximately six to eight feet below where GW is first encountered, with a maximum expected depth of 20 feet bgs based on existing Site MWs. Following each borehole advancement, a MW consisting of (1) thread-coupled, flush-joint, two-inch diameter polyvinyl chloride (PVC) casing, (2) 10 or 15 feet of 10-slot PVC screen, and (3) a sand filter pack extending at least one-foot above the top of the screen will be constructed within the borehole. The MW screen will be placed at or near the bottom of the borehole so the screened interval straddles the depth at which GW was encountered, while taking into account potential seasonal fluctuations. Each MW will be sealed in accordance with WAC 173-160-450. In general, this MW sealing entails (1) installing a bentonite plug above the top of the filter pack, (2) filling the borehole annulus from the bentonite plug to near the land surface with bentonite or cement, and (3) installing a concrete surface seal. Flush-mount surface completions are planned. PIONEER field personnel will log borehole lithology and record MW construction details using the forms included in Appendix A.

Newly installed MW108 and MW109 will be developed after installation. Development will be conducted by over-pumping each MW with a submersible pump, using a surge block, and/or hand bailing until the turbidity in the development water is less than 5 nephelometric turbidity units (NTU). If it is clearly not practical to continue development to reach the 5 NTU goal, then an alternate development goal (e.g., 50 NTU or stable turbidity readings) may be established in consultation with the PIONEER Project Manager. A calibrated field turbidity meter will be used to measure the turbidity. PIONEER field personnel will record MW development activities and data using the forms included in Appendix A.

3.4.3 MW Surveying

A licensed surveyor will determine the vertical and horizontal locations of the newly installed MW108 and MW109 reference points (notch or mark, or north side of the top of PVC casing if no notch or mark).

The vertical elevation will be surveyed to an accuracy of 0.01-foot in NAVD88. The horizontal accuracy will be approximately one foot.

3.4.4 GWM Events

PIONEER will conduct two quarterly GW monitoring (GWM) events. During each GWM event, the static water level and any measurable thickness of light non-aqueous phase liquid (LNAPL) will be measured in all Site MWs (i.e., MW101 through MW109) and piezometers (PZ101 through PZ103) using an electronic interface probe. The depth-to-water and any LNAPL thickness will be recorded to the nearest 0.01 foot from a consistent reference point (e.g., mark on the top of the MW casing). These measurements will be collected as synoptically as possible near low tide.

During each GWM event, GW samples will only be collected for laboratory analysis from MW108 and MW109. The following low-flow purging standard operating procedures will be used to purge water from MW108 and MW109 prior to sampling. A peristaltic pump, equipped with dedicated polyethylene tubing, will be used to purge water from the MWs. The tubing intake will be positioned approximately two feet below the top of the MW screen or two feet below the water level, whichever is lower. However, depending on the amount of drawdown during purging, the pump intake may need to be adjusted to a deeper interval. A variable-frequency drive controller on the pump will be used to limit the purging flow rate to less than one liter per minute. During purging, relative water levels will be monitored with an interface probe or electronic water level indicator, and water quality parameters (i.e., pH, specific conductivity, turbidity, dissolved oxygen, temperature, and oxidation/reduction potential) will be measured with a calibrated water quality meter to verify stabilization. Acceptable stabilization criteria are listed on the GWM Form included in Appendix A. In the event that water quality parameters do not stabilize, purging will be considered complete after 60 minutes of continuous purging. GW samples will be collected immediately following purging without turning off the pumping system. If a MW is pumped dry before the sample can be collected, a GW sample will be collected as soon as GW in the MW recharges.

Constituents to be analyzed during the two GWM events are presented in Table 1. Key details about the laboratory analyses and sample containers associated with the GWM events are included in Section 3.5.

3.4.5 SVP Installation

A licensed Washington driller will install SVPs (i.e., SVP22 through SVP41). Following each borehole advancement, an SVP consisting of (1) ¼-inch diameter high density polyethylene tubing, (2) six inches of 10-slot PVC screen, and (3) a sand filter pack extending at least six inches above the top of the screen will be constructed within the borehole. SVP screens will be installed two feet above the first encountered GW or at a maximum depth of six feet bgs, whichever is shallower. If GW is encountered at a depth less than four feet bgs, the SVPs may not be installed. Each SVP will be sealed by installing a bentonite plug above the top of the filter pack to near the land surface, and capping the tube. Flush-mount surface completions are planned. PIONEER field personnel will log borehole lithology (if applicable) and record SVP construction details using the forms included in Appendix A.

3.4.6 Methane Soil Gas Sampling

For each new SVP that is installed (i.e., SVP22 through SVP41), at least three volumes of soil gas will be initially purged from each SVP using a GEM2000 landfill gas monitor. During this initial purging activity, the pressure differential and the methane, oxygen, and carbon dioxide concentrations will be measured with the GEM2000 landfill gas monitor at both the start of purging and the end of purging. The PIONEER Methane Field Measurements Form provided in Appendix A will be used in the field to record these data. Barometric pressure and other weather details will also be recorded on this form. The newly installed SVPs will be sealed with tape or rubber caps for at least 12 hours before any further field measurements are obtained.

At each new and existing SVP proposed for sampling (i.e., SVP6, SVP7, SVP9, SVP11, SVP16, SVP18, SVP19, and SVP22 through SVP41), additional purging will be conducted at least 12 hours after the initial purging (described in the previous paragraph) is completed. In this subsequent purging, the pressure differential and the methane, oxygen, and carbon dioxide concentrations will be measured with the GEM2000 landfill gas monitor at both the start of purging and the end of purging. The end of purging for this subsequent purging will be defined as 15 continuous minutes of purging or a stable methane concentration with an increase/decrease of less than 1% over five consecutive minutes of purging. The PIONEER Methane Field Measurements Form provided in Appendix A will be used in the field to record these data. Barometric pressure and other weather details will also be recorded on this form.

3.4.7 Global Positioning System Measurements

PIONEER will determine the horizontal coordinates of each sample location (excluding MWs) using a Trimble GeoXH global positioning system unit or similar unit, with an accuracy expectation of +/- one meter.

3.4.8 Equipment Decontamination Procedures

Non-dedicated sampling equipment (e.g., drill rods) will be decontaminated in accordance with the following procedures:

- All non-dedicated equipment will be cleaned before use.
- Following use at each sampling location, the affected portions of non-dedicated equipment will be scrubbed with potable water containing diluted detergent (e.g., Liquinox) before being sufficiently rinsed with potable water.
- All water generated during decontamination will be managed as investigation-derived waste.

3.4.9 Field Recordkeeping

PIONEER will complete the following forms to document each sampling event (see Appendix A):

- Field Checklist, which is used to assist with planning and coordination prior to a field event, and to document completion of field activities.
- Daily Field Report, which is used to document miscellaneous field activities on a daily basis (e.g., miscellaneous field notes, miscellaneous sampling notes).

- Subsurface Sampling Field Log, which is used to record drilling, lithologic (e.g., color, grain size, moisture, detail), and associated sampling details.
- MW Installation Form, which is used to record MW construction details and MW development data.
- GWM Form, which is used to record current MW conditions, static water level and LNAPL thickness measurements, purging data, sampling information, and investigation-derived waste details.
- Methane Field Measurements Form, which is used to record methane soil gas data for either the initial purging activity or the subsequent purging activity.

In addition, representative photographs should be taken as necessary to support documentation of the field investigation procedures.

3.5 Laboratory Analyses and Sample Containers

The constituents to be analyzed for Data Gap #1 will be select VOCs (i.e., EDB, PCE, and the PCE degradation products trichloroethylene, cis-1,2-dichloroethylene, and vinyl chloride) and arsenic (see Table 1). The constituents to be analyzed for Data Gap #2 will be dioxins/furans (see Table 1). No laboratory analyses will be necessary for Data Gap #3 because measurements of pressure differential, methane, oxygen, and carbon dioxide will be obtained in the field using a landfill gas monitor.

Laboratory analyses will be performed for soil and GW samples collected pursuant to this Work Plan. The analytical methods, sample container expectations, preservation requirements, and holding times relevant to each medium being sampled and the constituents being analyzed are presented in Table 3.

Requirements associated with filling soil and GW sample containers include:

- Sample containers will be provided by the laboratories.
- Unless otherwise noted below, sample containers will be filled until almost full in order to provide the laboratory with sufficient sample volume.
- Particles larger than approximately 1/4-inch should not be included in soil sample containers.
- At each sampling location, sample containers for VOC analyses will be filled before all other containers.
- Soil samples for VOC analyses will be collected and prepared in accordance with USEPA Method SW846-5035.
- GW sample containers for VOC analyses will be filled to a positive meniscus so that the containers do not contain any headspace.
- GW samples for arsenic analyses will be filtered in the field using a 0.45-micron filter.

3.6 Sample Labeling and Shipment

3.6.1 Sample Labeling

Sample labels will clearly indicate the Site location, sample number identification, date, time, sampler's initials, parameters to be analyzed, and added preservative (if any). Each sample will be individually labeled. Each sample number identification will be unique and will adhere to the PIONEER sample number schema included in Appendix B.

3.6.2 Chain-of-Custody Documentation

Chain-of-custody procedures will be followed to maintain and document sample possession. A sample is considered under a person's custody if it is in that person's physical possession, within visual sight of that person after taking physical possession, secured by that person so that the sample cannot be tampered with, or secured by that person in an area that is restricted to unauthorized personnel.

The originator (the sampler) will complete requested information on the custody record, including signature and date. Original signed custody records listing the samples in the cooler will accompany sample shipments.[4] The originator of the custody record will retain a copy of the custody record.

3.6.3 Sample Shipment

Sample packaging and shipping procedures are based on USEPA specifications and United States Department of Transportation regulations as specified in 49 Code of Federal Regulations (CFR) 173.6 and 49 CFR 173.24. Soil and GW samples will be packed in coolers with bubble wrap, bags, and ice in a manner to achieve preservation requirements while also preventing breakage of sample containers and leakage of melting ice. Samples will be shipped express delivery to the laboratory or dropped off at the laboratory by PIONEER field staff. If shipped, samples will be shipped as environmental samples and not hazardous material.

3.7 Investigation-Derived Waste

The following types of investigation-derived waste will be generated during sampling activities and will be handled as follows:

- Cuttings from soil borings will be placed in sealed and labeled drums, and temporarily stored in a secure area of the Site.
- Development water, purge water, and decontamination water will be placed in sealed and labeled drums, and temporarily stored in a secure area of the Site.
- Personal protective equipment (e.g., nitrile gloves) and other disposable sampling equipment will be disposed of as solid waste in the standard municipal solid waste stream.

All drummed investigation-derived waste will be characterized and then removed by a licensed waste transporter for off-Site treatment and/or disposal at a facility permitted to accept the waste.

[4] More than one custody form may be needed per cooler to list all the samples contained in the cooler.

SECTION 4: QUALITY ASSURANCE PROJECT PLAN

The purpose of this QAPP is to summarize the methodology for ensuring usable sampling and analysis data of acceptable quality are generated. This QAPP was prepared in general accordance with WAC 173-340-820 and Ecology guidance (Ecology 2016).

Typical contents of a stand-alone QAPP are not repeated if included elsewhere in this Work Plan. For instance, requirements for laboratory analytical methods, sample containers, preservation, and holding times are already described in the SAP. Likewise, field procedures associated with quality assurance (e.g., equipment decontamination, field recordkeeping, sample identification schema, sample handling and shipment) are already described in the SAP.

4.1 Calibration of Field Equipment

The PID, turbidity meter (used for MW development), and water quality meter (used for GWM) will be calibrated daily using procedures in accordance with the manufacturer's recommendations. The calibration will be documented in the field notes.

4.2 Field Quality Control Samples

Field quality control (QC) samples will include field duplicates, a matrix spike/matrix spike duplicate[5], VOC trip blanks, and cooler temperature blanks. Unless otherwise noted, field QC samples will be handled, preserved, and documented in the same manner as primary samples. The frequency expectation for each type of field QC sample is listed in Table 1.

Field duplicates and the matrix spike/matrix spike duplicate will be collected at random locations selected by the field sampling team. Field duplicate and matrix spike/matrix spike samples will be collected simultaneously with the primary sample using the same sample collection and preparation techniques. Blind duplicates will not be collected; rather, the duplicate sample will be identified with the same Site ID as the primary sample. Field duplicates and the matrix spike/matrix spike duplicate will be analyzed for the same constituents as the primary sample.

VOC trip blanks and cooler temperature blanks will be prepared and provided by Libby Environmental. VOC trip blanks will consist of organic-free water.

4.3 Laboratory Quality Control Samples

Libby Environmental and Pace Analytical will be responsible for conducting laboratory QC procedures and reporting laboratory QC results in accordance with the analytical methods and their standard operating procedures. Laboratory QC samples provide important qualitative results used to evaluate the laboratory QC procedures. Laboratory QC samples for applicable analyses will include method blanks,

[5] Matrix spikes and matrix spike duplicates are lab QC samples, but are also included with the field QC samples since the field sampling team is responsible for ensuring that appropriate sample volumes are collected for analysis of matrix spikes and matrix spike duplicates.

laboratory control samples (also known as blank spikes), matrix spikes, and matrix spike duplicates once per batch of analyses. Expectations for laboratory control limits for laboratory control samples, matrix spikes, and matrix spike duplicates are presented in Table 4. In addition, it is also expected that Libby Environmental and Pace Analytical will perform and report results of surrogate recovery for every sample (excluding analyses for arsenic). Expectations for laboratory control limits for surrogate recoveries are shown in Table 4.

4.4 Laboratory Target Reporting Limits

Analytical methods and laboratories have been selected to achieve low target reporting limits. The constituents being analyzed in each medium and a comparison of target reporting limits with the most stringent SLs are presented in Table 5. All of the target reporting limits are less than or equal to the corresponding SLs, with the exception that the EDB soil target reporting limit and the vinyl chloride soil and GW target reporting limits exceed the corresponding SLs. However, these EDB and vinyl chloride target reporting limits are reasonably sensitive and considered appropriate for the purpose of this investigation.

4.5 Data Quality Review

An evaluation of data quality will be performed for all field and lab data. Specifically, field records will be reviewed by PIONEER for completeness, accuracy, and legibility. The laboratories will review their results relative to method criteria and laboratory QC procedures as the data are generated. The laboratories will report their QC results and qualify data as necessary in a report suitable for a Level II data validation. PIONEER will also evaluate precision, accuracy, representativeness, comparability, completeness, and sensitivity by reviewing the following items relative to analytical method criteria, laboratory control limits, and national functional guidelines (USEPA 2016a, 2016b) as necessary:

- Comparison of actual analyses versus requested analyses
- Comparison of consistency between laboratory reports and associated electronic data deliverables
- Holding times
- Field QC sample results
- Lab QC sample results
- Actual reporting limits

As a result of the data quality review process, PIONEER may reject data or add other qualifications in addition to the laboratory qualifications. The data quality review documentation will be included with the applicable laboratory reports for reporting purposes.

4.6 Corrective Action

The need for corrective action will be evaluated as appropriate for deviations from the SAP/QAPP and other potential data quality issues that arise in the field or the laboratory. Relatively minor field issues will be discussed, resolved, and documented by the PIONEER Project Manager, PIONEER Field Team

Lead, and/or laboratories. Corrective action decisions will be situation-dependent. Potential corrective action decisions may include one or more of the following:

- Revising the sampling and analysis methodology
- Collecting a new sample
- Reanalyzing an existing sample
- Accepting the data with a recognized level of uncertainty
- Revising the sampling design

SECTION 5: REFERENCES

Ecology. 1994. Natural Background Soil Metals Concentrations in Washington State, Publication No. 94-115. October.

Ecology. 1995. Guidance on Sampling and Data Analysis Methods. January.

Ecology. 2016. Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies. December.

Ecology. 2022a. Natural Background Groundwater Arsenic Concentrations in Washington State, Publication No. 14-09-044. January.

Ecology. 2022b. Toxics Cleanup Program's Cleanup Levels and Risk Calculations database, https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx, accessed August.

GeoEngineers. 2013. Ecology Draft Final Remedial Investigation/Feasibility Study Report. Former Reliable Steel Site. 1218 West Bay Drive NW, Olympia, Washington. July 18.

PIONEER. 2020a. Phase I Environmental Site Assessment. Hardel Mutual Plywood Corporation. 1210 West Bay Drive NW. Olympia, Washington. February.

PIONEER. 2020b. Phase II Environmental Site Assessment, Hardel Mutual Plywood Corporation, 1210 West Bay Drive NW, Olympia, Washington. October.

PIONEER. 2021a. RI Data Gaps Investigation Work Plan, Hardel Mutual Plywood Corporation, 1210 West Bay Drive NW, Olympia, Washington. March.

PIONEER. 2021b. Remedial Investigation Data Gap Report, Hardel Mutual Plywood Corporation Site, 1210 West Bay Drive NW, Olympia, Washington. August.

PIONEER. 2021c. Minor Updates/Clarifications to the March 2021 RI Data Gaps Investigation Work Plan for Methane Soil Vapor Sampling at the Hardel Mutual Plywood Corporation Site, Olympia Washington USEPA Brownfield Assessment Grant (BF01J66201). September 28.

PIONEER. 2022a. RI Data Dap Report Addendum #1, Hardel Mutual Plywood Corporation Site, 1210 West Bay Drive NW, Olympia, Washington. March 31.

PIONEER. 2022b. Responses to Nick Acklam's January 11, 2022 Verbal Comments on the August 2021 RI Data Gap Report, Hardel Mutual Plywood Corporation Site, 1210 West Bay Drive NW, Olympia, Washington. October 25.

TetraTech. 1999. Phase I Environmental Site Assessment. Hardel Mutual Plywood Waterfront Property, 1210 N.W. West Bay Drive, Olympia, Washington. 1999.

USEPA. 2016a. National Functional Guidelines for Inorganic Superfund Methods Data Review. EPA-540-R-2016-001. September.

USEPA. 2016b. National Functional Guidelines for Superfund Organic Methods Data Review. EPA-540-R-2016-002. September.

Figures

PIONEER TECHNOLOGIES CORPORATION

Location Map
Work Plan to Address Ecology's RI Data Gaps
Hardel Mutual Plywood Corporation Site

Figure 1

PIONEER TECHNOLOGIES CORPORATION

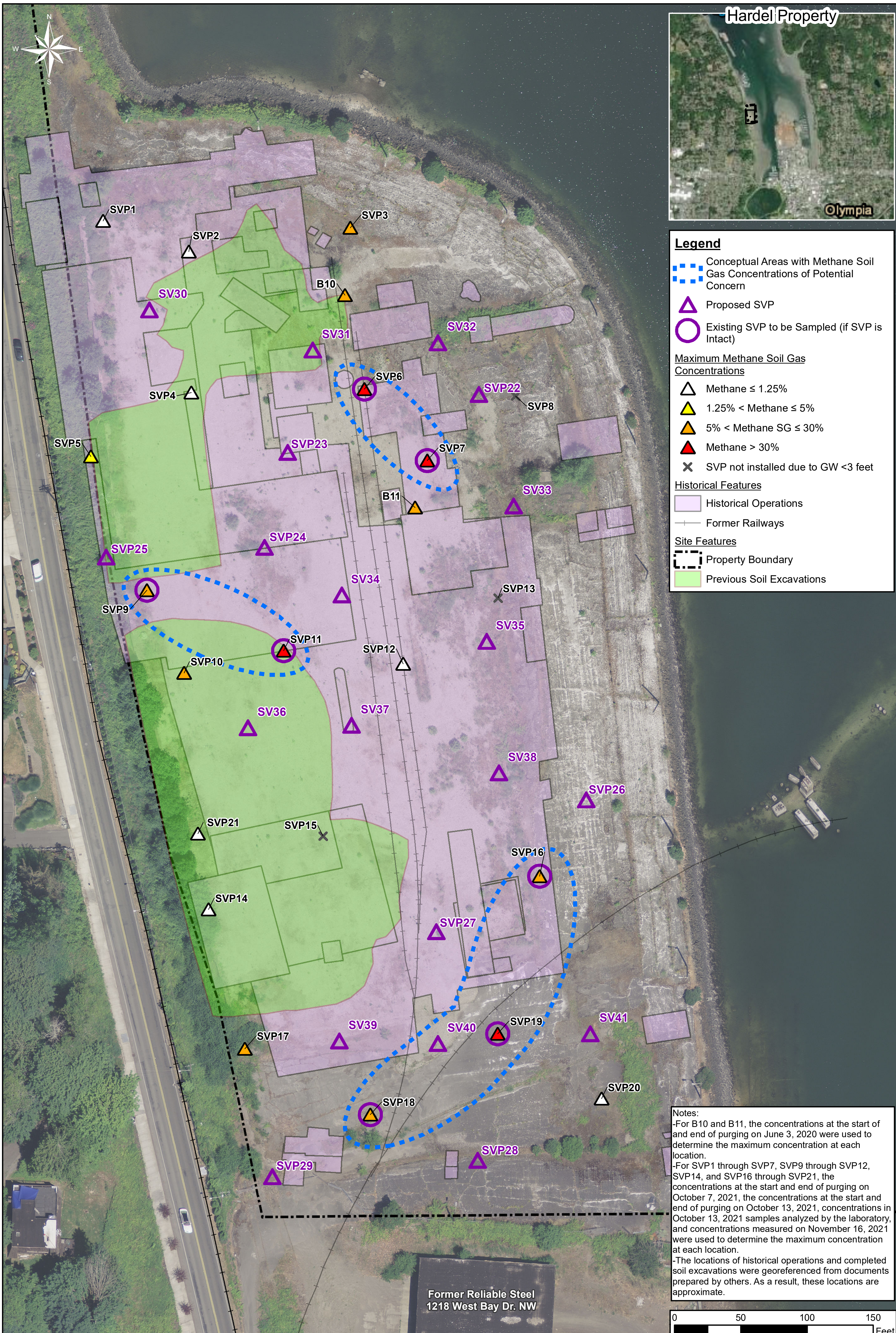
Proposed Sampling Locations for Data Gap #1
Work Plan to Address Ecology's RI Data Gaps
Hardel Mutual Plywood Corporation Site

Figure 2

PIONEER TECHNOLOGIES CORPORATION

Proposed Sampling Locations for Data Gap #2
Work Plan to Address Ecology's RI Data Gaps
Hardel Mutual Plywood Corporation Site

Figure 3



PIONEER TECHNOLOGIES CORPORATION

Proposed Sampling Locations for Data Gap #3
Work Plan to Address Ecology's RI Data Gaps
Hardel Mutual Plywood Corporation Site

Figure 4

Document Path: G:\Projects\Hardel\Maps\2022\Ecy RI Data Gaps\Sept 2022 Work Plan Update\Fig 4_ProposedSampleLocationsDG3.mxd; Author: VN; Date Saved: 10/18/2022

Tables

Table 1: Sampling Design to Address Ecology's RI Data Gaps

Data Gap #	Summary of Sampling Activity to Address Data Gap	Investigation-Specific Sampling Design Details [1]	Constituents and Anticipated # of Samples				
			Media	Select VOCs [2]	Arsenic	Dioxins/ Furans	Field Methane Measurements
1	Install, develop, and survey new MWs MW108 and MW109 (see Figure 2).	• Install MWs in the shallowest GW-bearing unit. • Log each boring with visual, olfactory, and frequent PID measurements. • If visual, olfactory, or PID evidence of contamination is encountered in a boring during drilling, collect one soil sample from the worst-case interval based on field screening results and analyze for select VOCs. • If visual, olfactory, or PID evidence of contamination is not encountered in a boring during drilling, do not collect a soil sample.	Soil	To be determined	To be determined	--	--
	Conduct two quarterly GWM events.	• None (see Section 3.4.4).	GW	4	4	--	--
2	Advance, log, and sample soil borings B301 through B305 (see Figure 3).	• Advance each boring to 10 feet bgs. • Carefully screen each boring for the presence of ash. • If ash is encountered in a boring, collect one worst-case sample of the ash. • If ash is not encountered in a boring, collect one soil sample from the shallowest soil underneath post-1996 fill (e.g., underneath the crushed concrete layer placed on the surface during the 2010 interim action).	Soil	--	--	5	--
3	Install new SVPs SVP22 through SVP41 (see Figure 4).	• Most borings will be blind drilled and will not receive field screening (see Section 3.4.1). • No soil samples will be collected.	--	--	--	--	--
	Collect field methane soil gas measurements at new SVPs SVP22 through SVP41 (see Figure 4).	• None (see Sections 3.4.5 and 3.4.6).	SG	--	--	--	20
	Collect field methane soil gas measurements at existing SVPs SVP6, SVP7, SVP9, SVP11, SVP16, SVP18, and SVP19 (see Figure 4) if these existing SVPs remain intact.		SG	--	--	--	7
Waste characterization and field QC samples [3]		Waste characterization composite	Soil	1	1	0	--
		Waste characterization composite	GW	1	1	0	--
		Field duplicate	Soil	0	0	0	--
		Field duplicate	GW	1	1	0	--
		VOC trip blank	GW	2	--	--	--
			Total soil samples	1	1	5	0
			Total GW samples	8	6	0	0
			Total SG samples	0	0	0	27

Notes:

--: not applicable; SG: soil gas

(1) The purpose of this column is to add or clarify key investigation-specific sampling design details that are not explicitly mentioned in the standard field investigation procedures (see Section 3.4).

(2) The select VOCs are EDB, PCE, trichloroethylene, cis-1,2-dichloroethylene, and vinyl chloride.

(3) Frequency expectations for field QC samples are one field duplicate for all GW samples (across both GWM events), two VOC trip blanks (one for each GWM event), and cooler temperature blanks (one for each cooler). In addition, extra volume will be collected for one soil matrix spike/matrix spike duplicate and one GW matrix spike/matrix spike duplicate.

Table 2: Anticipated Investigation Roles and Responsibilities

Project Role	Name and Contact Information	Key Responsibilities
PIONEER Principal and Project Manager	Troy Bussey, P.E., L.G., L.HG. busseyt@uspioneer.com (360) 570-1700	• Manage overall completion of the investigation • Communicate and coordinate with client and Ecology • Oversee preparation of planning and reporting documents • Oversee completion of fieldwork • Support implementation of site-specific health and safety plan
PIONEER Health and Safety Manager	Kevin Gallagher, ASP gallagherk@uspioneer.com (360) 570-1700	• Develop site-specific health and safety plan • Oversee implementation of site-specific health and safety plan
PIONEER Field Team Lead and Site Safety Officer	Joel Hecker, L.G., L.HG. heckerj@uspioneer.com (360) 570-1700	• Support project manager with preparation of planning and reporting documents • Implement site-specific health and safety plan • Coordinate and oversee completion of all field work • Collect all samples
PIONEER Field Staff	To be determined	• Support Field Team Lead with collection of samples and methane readings
Licensed Driller	Holocene Drilling (253) 848-6500	• Advance soil borings • Install MWs and SVPs • Develop MWs
Licensed Surveyor	To be determined	• Determine the horizontal coordinates of the MWs • Determine the vertical elevations of the MW measuring points
Analytical Laboratories	Libby Environmental (360) 352-2110	• Analyze soil and GW samples associated with Data Gap #1 • Perform laboratory quality control activities
	Pace Analytical (612) 607-6400	• Analyze soil samples for dioxins/furans analyses (Data Gap #2) • Perform laboratory quality control activities

Table 3: Analytical Methods, Sample Containers, Preservation, and Holding Times

Constituent(s)	Media	Analytical Method	Sample Containers	Preservation	Extraction Holding Times (days)	Analysis Holding Time (days)
VOCs	Soil	USEPA Method SW846-8260D	Two pre-tared 40 mL VOA vials with Teflon septa lids	Lab-supplied methanol preservative in each VOA [1]; Place on ice to cool to 4°C +/- 2°C	--	14
	GW		Two 40 mL glass VOA vials with Teflon septa lids	Lab-supplied HCl preservative in each VOA; No headspace in VOA; Place on ice to cool to 4°C +/- 2°C	--	14
Arsenic	Soil	USEPA Method SW846-6000 Series	One 8 oz amber glass jar	Place on ice to cool to 4°C +/- 2°C	--	180
	GW		One 125 mL HDPE bottle		--	180
Dioxins/Furans	Soil	USEPA Method SW846-8290A	One 8 oz amber glass jar	Place on ice to cool to 4°C +/- 2°C	--	30

Notes:

--: not applicable; °C: degree Celsius; HCL: hydrochloric acid; HDPE: high density polyethylene; mL: milliliter; oz: ounce; VOA: volatile organic analysis

(1) Soil samples for VOC analysis will be collected and prepared in accordance with USEPA Method SW846-5035.

PIONEER TECHNOLOGIES CORPORATION

Table 4: Laboratory Control Limits

Constituent(s)	Media	Analytical Method	LCS	MS/MSD		Surrogates
			% Recovery	% Recovery	RPD	% Recovery
VOCs	Soil and GW	USEPA Method SW846-8260D	80 - 120	65 - 135	≤ 20	70 - 130
Arsenic	Soil and GW	USEPA Method SW846-6000 Series	80 - 120	75 - 125	≤ 20	N/A
Dioxins/Furans	Soil	USEPA Method SW846-8290A	67 - 158	N/A	≤ 25	35 - 197

Notes:

LCS: Laboratory control sample; MS/MSD: Matrix spike/matrix spike duplicate; N/A: Not applicable; RPD: Relative percent difference

Table 5: Target Reporting Limits

Constituent	Soil: Analytical Method	Soil: Target Reporting Limit [1] (mg/kg)	Soil: Most Stringent Soil SL [2] (mg/kg)	GW: Analytical Method	GW: Target Reporting Limit [1] (ug/L)	GW: Groundwater SL [2] (ug/L)
VOCs						
Ethylene Dibromide (EDB)	SW846-8260D	**0.0050**	0.00079 [3]	SW846-8260D	0.010	0.050
Tetrachloroethylene		0.020	0.029		1.0	2.9
Trichloroethylene		0.020 [4]	0.020 [3]		0.70 [4]	0.70
1,2-cis-Dichloroethylene		0.020	0.079		1.0	16
Vinyl Chloride		**0.020**	0.0011		**0.20**	0.18
Metals						
Arsenic	SW846-6000 Series	5.0	20	SW846-6000 Series	1.0	8.0
Dioxins/Furans						
Total dioxins/furans [5]	SW846-8290A	1.0E-06 to 1.0E-05	1.30E-05	N/A	N/A	N/A

Notes:

N/A : not applicable; CLARC: Cleanup Levels and Risk Calculation; PQL: practical quantitation limit

Target reporting limits in bold font exceed the corresponding SL.

(1) It may not be possible to achieve these reporting limits in all samples (e.g., samples requiring extra dilution to achieve laboratory control limits, interferences).

(2) The most stringent SL from the RI Data Gap Report (PIONEER 2021b), with the exception that (1) 1,2-cis-dichloroethylene and vinyl chloride SLs were obtained from Ecology's CLARC database (Ecology 2022b) since SLs for these constituents were not presented in the RI Data Gap Report, and (2) the arsenic GW SL was adjusted up to the new Puget Sound Basin natural background concentration (Ecology 2022a). In addition, the latest CLARC database (Ecology 2022b) was reviewed to verify the validity of SLs from the RI Data Gap Report. Some SLs may need to be adjusted up to the practical quantitation limit if used as the basis for a cleanup level.

(3) For current screening purposes in the RI Data Gap Report (PIONEER 2021b), the lowest practical PQL in any sample was considered for a current PQL adjustment in accordance with WAC 173-340-740(5). In the case of EDB and trichloroethylene, the current SLs were adjusted up to the lowest PQL in any sample. The current SL may need to be adjusted up further in the future in accordance with WAC 173-340-740(5) since some samples had PQLs greater than this SL.

(4) These target reporting limits for trichloroethylene (which are slightly lower than the laboratory's standard target reporting limits) will be requested.

(5) The range of shown target reporting limits captures the target reporting limits for the 17 different dioxin/furan congeners, while the SL is for the 2,3,7,8-tetrachloro dibenzo-p-dioxin toxicity equivalency quotient concentration.

Appendix A

PIONEER TECHNOLOGIES CORPORATION (PTC)
FIELD CHECKLIST

Project/Task Name: ______________________ Site Location: ______________________

Requested By / Date: ______________________ Work Deadline: ______________________

SERVICES REQUESTED — **COMPLETED**

______________________	☐ YES ☐ NO
______________________	☐ YES ☐ NO
______________________	☐ YES ☐ NO
______________________	☐ YES ☐ NO
______________________	☐ YES ☐ NO
______________________	☐ YES ☐ NO
______________________	☐ YES ☐ NO
______________________	☐ YES ☐ NO
______________________	☐ YES ☐ NO
______________________	☐ YES ☐ NO
______________________	☐ YES ☐ NO
______________________	☐ YES ☐ NO

ADDITIONAL STANDARD INSTRUCTIONS	COMPLETED		COMPLETED
☐ Review Docs: ______________	☐ YES ☐ NO	☐ Health & Safety Meeting	☐ YES ☐ NO
☐ Agency NOI / Utility Locate / Concrete Coring	☐ YES ☐ NO	☐ Call PM from Site	☐ YES ☐ NO
☐ Coordinate Access: ______________	☐ YES ☐ NO	☐ Draw Site Map ______________	☐ YES ☐ NO
☐ Coordinate Sub / Equip: ______________	☐ YES ☐ NO	☐ Cuttings / Purge Water Characterization & Disposal	
☐ Purchase / Rent Equip: ______________	☐ YES ☐ NO	☐ Potential HW ______________	☐ YES ☐ NO
☐ Client/Agency Coordination: ______________	☐ YES ☐ NO	☐ Non-Haz ______________	☐ YES ☐ NO
☐ Calibrate Equipment: ______________	☐ YES ☐ NO	☐ Background ______________	☐ YES ☐ NO

____

____

SAMPLING REQUIREMENTS

☐ Field Testing: ____

☐ Lab Testing: ______________________________ Laboratory: ______________

☐ Lab Testing: ______________________________ Laboratory: ______________

☐ Lab Testing: ______________________________ Laboratory: ______________

FIELD SUPPLIES NEEDED

☐ Site Map ☐ Camera ☐ Survey Equip / GPS ☐ Vehicle

☐ Std Field Equip (keys, forms, SAP, HASP, PPE, decon, tools)

☐ Drilling Equip (PID, references, knife, baggies, tape)

☐ Soil Equip (SS bowls, spoon/shovel, hand auger, pick, sieves)

☐ GWM (pump, tubing, gen., compres., bailers, rope/string, PDB)

☐ Pump / Slug Test Equip (GWM Equip, slug, stopwatch)

☐ Water Level Indicator / Interface Probe

☐ Water Quality Meter ________ ☐ Field Test Kits________

☐ Sample Kit / Cooler / COC / Ice ________

☐ IDW: ☐ Drums ________ ☐ 5-gal buckets ________

☐ Other: ______________________

☐ Other: ______________________

PIONEER TECHNOLOGIES CORPORATION (PTC)
DAILY FIELD REPORT

Date:______________ Site Location: ______________________________ Site Arrival Time: ___________ Site Departure Time :___________

WEATHER	Clear Sun	Overcast	Drizzle	Rain	Snow
TEMPERATURE	To 32	32-50	50-70	70-85	85 Up
WIND	Calm	Med.	Strong	Severe	

PEOPLE PRESENT ON-SITE

NAME	ASSOCIATION	TIME ON-SITE AND OFF-SITE

NOTES ON WORK COMPLETED

SIGNATURE:____ DATE:________________

PIONEER TECHNOLOGIES CORPORATION

Project No.: ____________________

Project Name: ____________________

Location: ____________________

Subsurface Sampling Field Log

(applicable for direct-push Geoprobes, hand augers, and test pits)

Drilling Date(s): ____________________ Client: ____________________

Drilling Company: ____________________ Field rep: ____________________

Sampling Location ID: ____________

Sampling Method/Equipment: ____ Geoprobe Rig No. ____________ Driller(s): _Casey______________

Soil Collection and Recovery

Sampler No.	**Tool Length** (ft.)	**Actual Advanced Interval** (ft. - ft.)	**Recovery** (in.)
1			
2			
3			
4			
5			
6			

SOIL Analytical Sample(s)

Sample Interval	**Basic Soil Type**	**Time**	**Weight for Meth** (g)	**Dup #**

PID Screening

Depth (ft.)	**Result** (ppm)
1	
3	
5	
7	
9	
11	
13	
15	

Soil Profile/Lithology (include thickness of surfacing material)

Interval (ft. - ft.)	**Description** (draw horizontal line breaks between units!) (Indicate all depths in feet, e.g. instead of 11 inches, write 0.92 ft.) (For fill, qualify the description with the prefix "FILL-")	**Symbol** (e.g. SP, CL, SM, etc)	**Remarks** (include specific depth of observation; note staining, odors, etc. in this column)

END OF BORING DEPTH: ___________

GROUNDWATER DEPTH DURING DRILLING:_________ AFTER:__________

GROUNDWATER Analytical Sample(s)

Screen Interval (ft. - ft.)	**Time**	**Dup #**	**Remarks** (e.g. odors, sheen, silty, filtered metals/PAHs, etc)

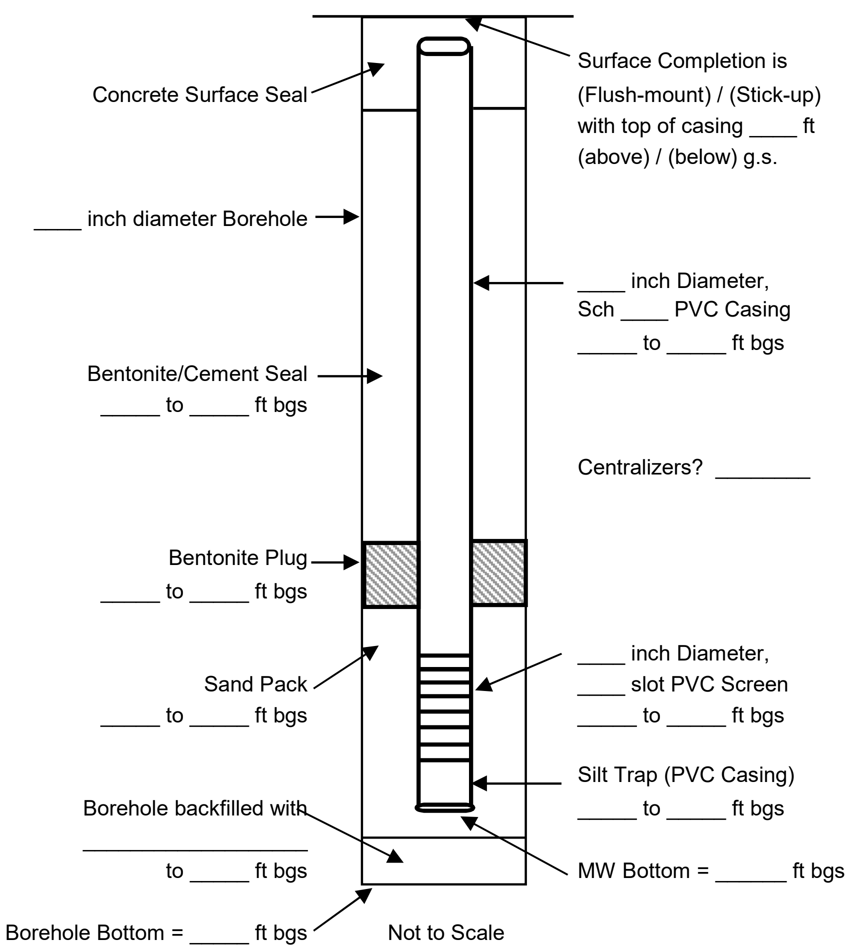
Borehole Backfill:

General Notes: (e.g. notes about location, site conditions, etc):

PIONEER TECHNOLOGIES CORPORATION (PIONEER)
MW INSTALLATION FORM

MW ID ________________ Installation Start Date/Time ________________ Installation Stop Date/Time ________________

CONSTRUCTION DETAILS



MATERIALS USED

_____ Sacks of ________________ Sand
_____ Sacks of ________________ Cement
_____ Sacks of Bentonite Pellets
_____ Sacks of Powdered Bentonite
_____ Sacks of Grout
_____ Feet of ______ -inch dia PVC Casing
_____ Feet of ______ -inch dia PVC Screen

WELL PROTECTION AND IDENTIFICATION

- ☐ Well Cap
- ☐ Locking Steel Cover (Stick-up)
- ☐ Bollards (Stick-up)
- ☐ Lock
- ☐ Agency Well Tag No. ____________
- ☐ Top of Casing Ref Pt. = ____________

WELL DEVELOPMENT

	Following Well Construction	Following Well Development
Depth To Water (ft below TOC)		
Total Well Depth (ft below TOC)		

Development Start Date/Time ____________________ Development Stop Date/Time ____________________
Development Method ________________________ Development Water Discharged to ________________________

Elapsed Time (min)	pH	Flowrate (gpm)	Sp. Cond. (mS/cm)	Turb (NTU)	D.O. (mg/L)	Temp (oC)	Comments on TSS/Color

Total Gallons Removed ________________________

Additional Remarks

PIONEER TECHNOLOGIES CORPORATION (PIONEER)
GROUNDWATER MONITORING FORM

Stabilization:
SWL < 0.33 ft — Turb ± 10%
pH ± 0.1 — DO ± 0.3 mg/L
SC, Temp ± 3% — ORP ± 10 mV

SITE NAME: ____________ **FIELD TECHNICIAN(S):** ____________ **DATE:** ____________

WELL INFO				DTW				PURGING											SAMPLE COLLECTION		PURGE WATER	
										Stabilization												
Well ID	Total Depth (ft)	Screen Interval (ft)	Current Condition (e.g., seal, cover, cap, casing, lock)	Time	Depth to NAPL (ft)	Depth to Water (ft)	NAPL Thick. (ft)	Pump Type	Intake Depth (ft)	Elaps. Time (min)	Flow Rate (L/min)	SWL (ft)	pH	Spec. Cond. (mS/cm)	Turb (NTU)	D.O. (mg/L)	Temp (^oC)	ORP (mV)	Time	Field Kit Results / General Comments	Vol (gal)	Disposal / Storage Comments

Methane Field Measurements Form

PIONEER TECHNOLOGIES CORPORATION

Site Name: ______________________

Sampler Name: ______________________

Date: ______________________

Weather Conditions: ______________________

Instrument: ______________________

Barometric Pressure (inches Hg): ______________________

Pressure Differential Units for This Instrument (e.g., inches Hg, inches H_2O): ______________________

Temp (^oF): ______________________

Samp_No	Start Time	Initial Conditions at Start of Purging					Final Conditions at End of Purging					Notes (e.g. did conditions stabilize?)
		Pressure Differential (Record Units!)	CH_4 (%)	O_2 (%)	CO_2 (%)	Balance (%)	Pressure Differential (Record Units!)	CH_4 (%)	O_2 (%)	CO_2 (%)	Balance (%)	

Notes: ______________________

Appendix B

Memo

5205 Corporate Ctr. Ct. SE, Ste. A
Olympia, WA 98503-5901
Phone: 360.570.1700
Fax: 360.570.1777
www.uspioneer.com

To: File

From: PIONEER

Date: July 13, 2016

Subject: PIONEER Technologies Corporation Sample Number Schema

All:

The following sample number schema should be used on all PIONEER Technologies Corporation (PTC) projects:

MediaCode-SiteID-DateCode-TopDepth-BotDepth-(PTCTypeCode) – Be sure to use Dashes and Not Underscores

- Media Code = 2 Letter Code for Media Sampled At Location (see Table 1)
- Site ID = 1 to 10 Letter/Number Code for Site ID (with Dash between Site ID and Site ID # (e.g., MW-01)
- DateCode = 6 Number Code for Date (no slashes between monthdayyear)
- TopDepth = Optional but must have 1 decimal point max.
- BotDepth = Optional but must have 1 decimal point max.
- PTCSampTypeCode = Optional (see below)
  - (01) – For Field Duplicate/Replicate #1/Test Case #1
  - (02) – Replicate #2 or Test Case #2
  - (03) – Replicate #3 or Test Case #3
  - (04) – Replicate #4 or Test Case #4
  - (05) – Replicate #5 or Test Case #5
  - (06) – Replicate #6 or Test Case #6
  - (07) – Replicate #7 or Test Case #7
  - (08) – Replicate #8 or Test Case #8
  - (09) – Replicate #9 or Test Case #9
  - (10) – Leachate Sample
  - (20) – Dissolved Sample (i.e., filtered in the field or by the lab)

Note: PTCSampTypeCodes can be combined. For example, a PTCSampTypeCode of "(11)" indicates that the sample is a field duplicate of a leachate sample and a PTCSampTypeCode of "(21)" indicates that the sample is a field duplicate of a dissolved/filtered sample.

Examples:

- EF-EF-01-100112 – No Depth Interval
- EF-EF-01-100112-(01) – No Depth Interval & Field Duplicate Sample of EF-EF01-100112
- GW-MW-01-100112-10.5-20.5 – With Depth Intervals (10.5 to 20.5 feet)

- SO-SS-01-100112-0-0.5 – With Depth Intervals (0 to 0.5 feet)

Note: Examples of leachate and dissolved samples that require field duplicates or replicates:

- SO-SS-01-100112-0-0.5-(11) – Field Duplicate of Leachate sample with depth Intervals (0 to 0.5 feet).
- SO-SS-01-100112-0-0.5-(14) – Replicate #4 of Leachate sample with depth Intervals (0 to 0.5 feet).
- GW-MW-01-100112-10.5-20.5-(21) – Field Duplicate of Dissolved/Filtered groundwater sample with depth intervals (10.5 to 20.5 feet)
- GW-MW-01-100112-10.5-20.5-(23) – Replicate #3 Triplicate of Dissolved/Filtered groundwater sample with depth Intervals (10.5 to 20.5 feet).

Table 1 – PTC Media Codes for Sample Numbers

Media	Media Code for Sample Number	Description
Ambient Air	AA	Ambient Air
Asphalt	AS	Asphalt
Bituminous Coating	BC	Bituminous Coating
Brick	BR	Brick
Concrete	CO	Concrete
Dust	DT	Dust
Equipment Blank	EB	Equipment Blank
Effluent	EF	Effluent
Field Blank	FB	Field Blank
Field Spike	FS	Field Spike Sample
Groundwater	GW	Groundwater
Indoor Air	IA	Indoor Air
Influent	IN	Influent
Midpoint Between IN and EF	MD	Midpoint Between Influent and Effluent Samples
Other Liquid	OL	Non-specified Liquid
Other Solid	OS	Non-specified Solid
Performance Evaluation	PE	Performance Evaluation Sample
Perched Water	PP	Perched Water
Paint	PT	Paint, Paint Chips, Paint Flakes
Pore Water	PW	Sediment Pore Water
Sierra-Crete	SC	Sierra-Crete
Sediment	SD	Sediment
Stack Sample (Emissions)	SE	Stack Sample (Emissions)
Soil Gas	SG	Soil Gas, Soil Vapors, Sub-Slab Soil Gas
Sludge	SL	Sludge
Soil	SO	Soil
Seep Water	SP	Seep Water from Bank Samples
Surfacewater	SW	Surfacewater

Table 1 – PTC Media Codes for Sample Numbers

Media	Media Code for Sample Number	Description
Trip Blank	TB	Trip Blank
Tap Water	TW	Tap Water, Drinking Water
Wood	WD	Wood Debris, Wood Waste
Waste Solid	WS	Investigation Derived Waste Solid
Waste Water	WW	Investigation Derived Waste Liquid
Treated Water	XW	Treated Water from Pilot Test, Treatability Study

Sincerely,

Chris Waldron

Attachment 3

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

DEPARTMENT OF ECOLOGY State of Washington

REQUEST FOR OPINION FORM

Use this form to request a written opinion on your planned or completed independent remedial action under the Voluntary Cleanup Program (VCP). Attach to this form the plans or reports documenting the remedial action. Please submit only one form for each request.

Step 1: IDENTIFY HAZARDOUS WASTE SITE

Please identify below the hazardous waste site for which you are requesting a written opinion under the VCP. This information may be found on the VCP Agreement.

Facility/Site Name: Hardel Mutual Plywood Corporation Site

Facility/Site Address: 1210 West Bay Drive NW, Olympia, WA

Facility/Site No: 75128579	VCP Project No.: SW1757

Step 2: REQUEST WRITTEN OPINION ON PLAN OR REPORT

What type of independent remedial action plan or report are you submitting to Ecology for review under the VCP? Please check all that apply.

- ☒ Remedial investigation plan
- ☐ Remedial investigation report
- ☐ Feasibility study report
- ☐ Property cleanup* plan (* cleanup of one or more parcels located within the Site)
- ☐ Property cleanup* report
- ☐ Site cleanup plan
- ☐ Site cleanup report
- ☒ Other – please specify: Will all RI data gaps be addressed once the work in the enclosed Work Plan is satisfactorily completed? Note the enclosed Work Plan is supplemental to Greylock's 2007 RI Report, Greylock's 2010 IA Closure Report, PIONEER's August 2021 RI Data Gap Report, PIONEER's March 2022 RI Data Gap Report Addendum #1, and the enclosed "Responses to Nick Acklam's January 11, 2022 Verbal Comments on the August 2021 RI Data Gap Report."

Do you want Ecology to provide you with a written opinion on the planned or completed independent remedial action?

☒ Yes ☐ No

Please note that Ecology's opinion will be limited to:

- Whether the planned or completed remedial action at the site meets the substantive requirements of the Model Toxics Control Act (MTCA), and/or
- Whether further remedial action is necessary at the site under MTCA.

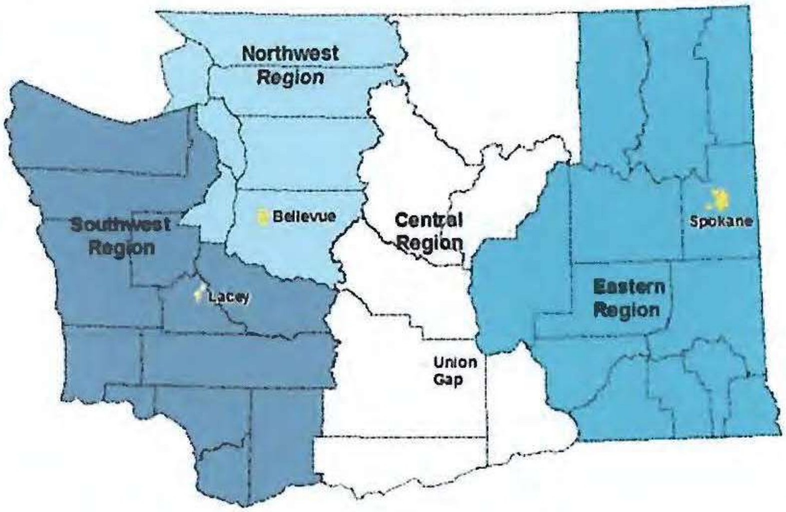
Step 3: REPRESENTATIONS AND SIGNATURE

The undersigned representative of the Customer hereby certifies that he or she is fully authorized to request services from Ecology under the Agreement for this VCP Project.

Name: Kim Seely	Title:
Signature:	Date: 10/25/22
Organization: Coastline Law Group PLLC	
Mailing address: 4015 Ruston Way, Suite 200	
City: Tacoma	State: WA / Zip code: 98402
Phone: 253-203-6226 / Fax:	E-mail: kseely@coastlinelaw.com

Step 4: SUBMITTAL

Please mail your completed form and the independent remedial action plan or report that you are requesting Ecology review to the site manager Ecology assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



Northwest Region: Attn: VCP Coordinator 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: VCP Coordinator 1250 West Alder St. Union Gap, WA 98903-0009
Southwest Region: Attn: VCP Coordinator P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Attn: VCP Coordinator N. 4601 Monroe Spokane WA 99205-1295

If you need this publication in an alternate format, please call the Toxics Cleanup Program at 360-407-7170. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

ECY 070-219 (revised July 2015)