Comment Response Matrix
Groundwater Source Control Evaluation Report and Groundwater Sampling Work Plan Scope Outline
Willamette Cove Uplands

Comments from the Five Tribes – Groundwater Source Control Evaluation Report				
Reviewer Comment No.	Section Name/ Topic	Section/ Table/ Figure No.	Five Tribes Comments 1/31/2024	Port Response/Action
Specific 1	Historical Site Use	Section 2.2	Section 2.2 describes historical operations on the West Parcel "as a plywood mill and… wood products facility…" We recommend that a more detailed and specific description of historical operations be provided. In particular, boring logs for monitoring wells MW-1 and MW-2 report creosote odor and chemical analyses of groundwater have detected pentachlorophenol, both of which suggest that wood treating may have occurred on site. The report references former wood treatment operations associated with the adjacent McCormick & Baxter operations; however, we suspect that site is too distant to have caused creosote odors within Willamette Cove site borings. Since wood treating is associated with dense non-aqueous phase liquids (DNAPLs) and high concentrations of polycyclic aromatic hydrocarbons (PAHs), past wood-treating operations would be a potentially significant factor in evaluating contamination on site. Thus, a better understanding of historical operations could inform the investigation of the West Parcel.	Section 2.2 is a high-level overview of the site history. Additional detail regarding potential sources is presented in Section 2.4. An introductory sentence was added to Section 2.2 directing the reader to Section 2.4 for discussion of potential sources. There is no historical information or evidence of wood treatment activities or NAPLs on the West Parcel. The fill placed in the former log pond was sourced from multiple sites within Portland Harbor, and this fill is the primary source of the contaminants driving the source control evaluation on the West Parcel. Section 2.4 has been expanded to clarify the potential sources on the West Parcel.
Specific 2	Hydraulic Properties in Vicinity of MW-2	Section 6.3.4	Section 6.3.4 includes a discussion of the anomalous water levels in monitoring well MW-2. We recommend that this section also make reference to the water-level hydrographs in Appendix F. Those hydrographs show that water levels in MW-1, MW-3, MW-4, MW-5, and MW-9 track Willamette River water levels fairly closely, suggesting good hydraulic connectivity between the aquifer and the river. In contrast, water levels in MW-2 bear almost no resemblance to the river hydrograph and show only a muted and time-lagged reflection of the river's annual variation. The hydrograph data thereby suggest that MW-2 is installed in a pocket of water-bearing material that is isolated from the rest of the on-site aquifer and which has virtually no hydraulic connectivity with the river. Site data are insufficient to determine the size of this "pocket aquifer," which leaves uncertain the significance, if any, of water-level readings and chemical analyses from MW-2. For this reason, we recommend that the groundwater flow lines emanating from MW-2 in Figure 21 be shown in a qualified fashion (e.g., using dashed lines). Similarly, we question the validity of the 'Time to Reach River' estimate for MW-2 in Table 3, which is relatively rapid.	We agree with the conclusions presented in the comment as those conclusions are consistent with the overall model presented. Section 6.3.4 was expanded to include discussion of the hydrographs in Appendix G (formerly Appendix F). Figures 20 and 21 were revised to show the flow path lines emanating from MW-2 as dashed lines. We agree that the travel times for MW-2 are likely high. We presented the travel time estimates using a consistent approach for all wells (e.g., estimating hydraulic conductivity from correlation to soil type) and recognized that the estimates for MW-2 are likely high, but chose to keep as these are conservative (i.e., rapid travel times are more likely to indicate potential for groundwater to be a source control concern). In hindsight, the transducer data is a strong line of evidence for reduced hydraulic conductivity in the vicinity of MW-2. We have updated the travel time estimates in Table 3 (and revised corresponding text as needed) taking into consideration the transducer data to modify hydraulic conductivity estimates where appropriate.
Specific 3	Hydraulic Properties in Vicinity of MW-2	Section 6.3.4	Section 6.3.4 also includes this description of the hydrogeology around MW-2: "Fundamentally, higher water levels will occur where local inflow exceeds local outflow. This may occur from either a larger inflow, smaller outflow, or both. Either of these factors could be impacted by local geology (e.g., shallow coarse-grained soil near the surface in the vicinity of MW-2 could act as a conduit for greater infiltration, or fine-grained soil downgradient of MW-2 could impede groundwater flow away from the vicinity of the well). However, observing the soil conditions at MW-2 relative to nearby wells (see Figures 7 and 8), neither of these conditions are observed." We find this language to be speculative and recommend that it be removed. In particular, we do not believe that there are soil borings downgradient of MW-2 to support the last sentence of this quotation. MW-2 is screened within the former log pond, which was filled well after the remainder of the site. As such, the hydraulic properties in that area may be very different from elsewhere on site and could have given rise to the pocket aquifer in which MW-2 seems to be screened (see Comment #2). We believe that site data—and particularly the hydrographs in Appendix F—establish that MW-2 is hydrogeologically isolated and not representative of the site aquifer.	We revised Section 6.3.4 to remove general discussion about potential causes of the higher water levels in MW-2.

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Specific 4	Groundwater Seepage Measurements	Section 6.3.6	Section 6.3.6 analyzes seepage data and concludes "This figure shows that temperature is a good predictor of groundwater discharge, especially at locations of higher groundwater discharge." We do not believe this conclusion is supported by the limited available data. In particular, most of the measured average specific discharge values in Figure 19 are near zero, and the relationship between specific discharge and temperature appears to be defined by the two leftmost points (i.e., two samples with the largest temperature contrast and co-located discharge). Because the specific discharge rates estimated from the temperature correlation are not well supported, we recommend removing these estimates from Figure 20.	We believe that the temperature data are a useful line of evidence in supporting an overall model of groundwater transport to the river. We note that the text, as written, was unclear about the correlations used to estimate groundwater flux. Section 6.3.6 has been revised to better clarify how the temperature data were used to estimate groundwater flux, and Figure 20 was revised to indicate an upper bound on groundwater flux as estimated from the temperature data.
Specific 5	Groundwater Discharge Model	Section 6.4	Section 6.4 presents a groundwater discharge model based on a flow-net analysis of shoreline discharge. The flow-net analysis assumes isotropic and homogeneous soil, neither of which is valid for this site. The weakness of this model is revealed by the seepage measurements from the field. While the model predicts stronger groundwater discharge nearer to shore than further from shore (as shown by more closely spaced flowlines in Figure 22), the distributed seepage measurements offshore of the West Parcel (Figure 20) show no pattern of shoreline focusing. Indeed, with a layered mix of historically placed fill, one would expect a heterogenous pattern of groundwater discharge rather than the regular pattern predicted by the flow-net analysis. We recommend Section 6.4 be revised to report and draw conclusions from actual observations only.	The intent of the flow-net model is to identify the distance range where impacted groundwater is likely to discharge in the absence of heterogeneities. We recognized that the model is idealized and included discussion of the influence of anisotropy due to layering. We believe the model is useful to identify the range where sediment/porewater data should be evaluated for potential impacts. Additionally, when accounting for heterogeneities, the seepage data are consistent with the model, showing decreasing discharge with increasing distance from the shore and greater variation nearer the shore. The text of Section 6.4 was expanded to discuss potential impacts of heterogeneities and comparison to seepage data.
Specific 6	Arsenic	Section 8.1	Section 8.1 offers on page 30 that "Wood waste associated with the former log pond is likely present beneath the fill." We recommend this speculative language be replaced by references to the boring logs for B-7, DP-2, DP-5, and MW-3, all of which show wood in soil within the footprint of the former log pond.	Section 8.1 was revised to be more specific on the evidence of wood waste in West Parcel soil.
Specific 7	Arsenic	Section 8.1	Section 8.1 concludes with "This result is consistent with the hypothesis that reducing conditions in the West Parcel are responsible for the concentrations of arsenic in groundwater greater than background, but conditions become oxidized as groundwater migrates toward the river, returning arsenic concentrations to background." While we find this to be a reasonable hypothesis, it is untested. The additional groundwater monitoring proposed for the West Parcel in Section 8.8 should include samples for arsenic and measurements to determine the redox state of the groundwater to confirm the hypothesized redox gradient from the wells to the river.	Additional sampling included analysis for arsenic and redox conditions. Section 8.1 was expanded to discuss the additional sampling.
Specific 8	Carcinogenic PAHs (BaP Eq)	Section 8.2	Section 8.2 begins with the statement "PAHs are associated with petroleum hydrocarbons that do not occur naturally in the vicinity." We recommend that "wood-treating chemicals" be added to petroleum hydrocarbons in this statement. As indicated in Comment #1, the presence of wood-treating chemicals on site is strongly suggested by the creosote odors noted in the logs for MW-1 and MW-2.	Added reference to wood-treating chemicals.
Specific 9	Carcinogenic PAHs (BaP Eq)	Section 8.2	Section 8.2 includes the statement that "These higher concentrations [of benzo(a)pyrene toxicity equivalent] are likely associated with historical releases from the wood products industries." We recommend that the vague reference to "wood products industries" be replaced with a more specific reference to "wood-treating operations," with qualifications as appropriate if historical review does not unequivocally establish such operations were on site.	No change was made. There is no historical information suggesting wood treating was conducted on the West Parcel. As discussed in the updates to Section 2.4, the most likely source of wood treating chemicals on the West Parcel is the soil obtained from off-site that was used to fill the former log pond.
Specific 10	Total PCBs	Section 8.4	With respect to polychlorinated biphenyls (PCBs), Section 8.4 includes the statement "The clusters of sediment samples above RALs [remedial action levels] do not spatially correlate with higher groundwater concentrations (two of the three clusters are not adjacent to areas of higher groundwater concentrations)." We strongly	The statement as written is oversimplified. Section 8.4 has been revised to clarify the following points: 1) Two of the three areas with RAL exceedances are not adjacent to areas of higher groundwater concentrations. This establishes that there are sources of PCB RAL exceedances that are not the result of

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Willamette Cove Uplands

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			recommend that this sentence be deleted. Figures 29 and 30 make clear that there is a strong spatial correlation between the highest concentrations of PCBs in groundwater at MW-3 and the highest concentration of PCBs in sediment at WC-S005. Porewater samples near this location also show elevated concentrations of PCBs, implying a potential groundwater-to-sediment pathway for PCBs from the West Parcel. Accordingly, we recommend that the proposed additional monitoring (and new wells) on the West Parcel continue to be sampled for PCBs.	groundwater impacts, so the presence of RAL exceedances adjacent to the higher groundwater concentrations may be from a source other than groundwater. 2) With respect to the RAL exceedances near the West Parcel, review of PCB concentrations with depth indicate that the groundwater is not the source. Subsurface data are available for four of the five locations with surface sediment RAL exceedances. PCB concentrations are below cleanup levels or detection limits at depths below 1 to 3 feet in three locations (PCBs are less than the cleanup level below a depth of 3 feet at WC-S006 where the surface sediment PCB concentration is 11,700 µg/kg) and below a depth of 5 feet at the fourth location.
Specific 11	Dioxin/Furan TEQ	Section 8.5	The table in Section 8.5 (page 36) reports dioxin/furan toxicity equivalent (TEQ) values that differ from those in Table A-6, leaving uncertain which concentrations are accurate. The table below contrasts the summary information in Section 8.5 with the reported concentrations in Table A-6 for wells MW-1, MW-2, MW-3, and MW-5. The maximum values for MW-1 and MW-2 do not match the reported values, and the minimum values do not match for any well. We recommend that these discrepancies be rectified and/or explained. [Table included representing discrepancies between the table in Section 8.5 and Table A-6]	The values included in the text are correct (the minimum value for MW-5 and maximum values for MW-5 and MW-6 were incorrect and were updated). Table A-6 is a historical table that reported TEQ values as reported from the laboratory, not in accordance with Portland Harbor protocols for handling non-detect values in calculations. Table A-6 has been revised to report TEQ values consistent with Portland Harbor protocols.
Specific 12	DDD, DDE, DDT, and DDx	Section 8.6	Section 8.6 states "…fill used to reclaim the West Parcel log pond may have contained DDT [dichlorodiphenyltrichloroethane]." In contrast, Apex (2019b) indicates that the fill was sourced from the Arkema Chemicals Company site, a chemical manufacturing plant that produced, among other products, DDT. We recommend that more specific information about the likely nature of the log pond fill be used in the updated GW SCE report.	Additional details on fill sources were added to Section 2.4, and reference to that section was added to Section 8.6.
Specific 13	Groundwater Contaminant Flux to River	Section 8.7	Section 8.7 predicts an exceedance factor for dichlorodiphenyldichloroethane (DDD) based on the concentration in MW-2 and its subsequent attenuation. Given the problems with MW-2 as discussed above (Comments #2 and #3), we question the validity of predictions based on that particular well.	Section 8.7 was deleted from the updated report.
Specific 14	Groundwater Source Control Conclusions and Recommendations	Section 8.8	Section 8.8 states "We recommend collecting groundwater samples between the West Parcel upland monitoring wells and the porewater sampling locations offshore of the West Parcel and analyzing the samples for PAHs and DDD." We recommend the proposed sampling be described in more detail. There are no established sampling points between the monitoring wells and porewater sampling locations, so it is unclear if new monitoring wells or other sampling methods are being proposed. We strongly recommend that additional monitoring wells be installed to better understand the peculiar hydrogeology at MW-2. We also recommend that wells in the West Parcel be hydraulically tested through either an aquifer test or slug tests to further inform the understanding of the hydrogeology. Finally, as indicated in Comment #7, we recommend the monitoring program include measures of redox conditions in the West Parcel as well as additional sampling for arsenic.	A separate work plan describing the proposed sampling was prepared and approved by the DEQ. The sampling was implemented in February/March 2025, and discussion of the results was added in Sections 5.1, 8.1, 8.2, 8.4, and 8.6. To support discussion of the additional groundwater data, a new Section 5.4 was added to the report discussing upland soil data.
Editorial 15	Riverbank Profiles	Figure 12	Section 6.2.2 makes reference to the top of bank in discussing Figure 12. We recommend that the top of bank be labeled in Figure 12.	Top of bank label was added to Figure 12.
Editorial 16	Bathymetric Change, 2002 to 2009	Figure 13	Section 6.2.2 also makes reference to a linear feature in Figure 13. We recommend that feature be labeled in Figure 13.	The linear feature was identified on Figure 13.
Editorial 17	Groundwater Contaminant Flux to River	Section 8.7	Section 8.7 discusses attenuation without clearly defining the term. We recommend a definition be included to avoid ambiguity.	Section 8.7 was deleted from the report.

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Willamette Cove Uplands

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Editorial 18	Dioxins/Furans in Groundwater	Table A-6	Table A-6 reports dioxin and furan concentrations in µg/L, which leads to numerous leading zeroes and greatly reduces the legibility of the table. In addition, dioxin/furan TEQ is reported variously in scientific notation and decimal notation. We recommend the table be reproduced in units of pg/L to match the units used in the text.	The TEQ values in Table A-6 were revised.

Comments from EPA – Groundwater Source Control Evaluation Report				
Reviewer Comment No.	Section Name/ Topic	Section/ Table/ Figure No.	EPA Comments 4/23/2024	Port Response/Action
Primary 1	Recontamination Concerns	--	There are recontamination concerns if groundwater contamination has the potential to increase porewater concentrations in the Willamette River such that sediment cleanup levels (CULs) are exceeded over the long term. Recontamination is not just based on remedial action levels (RALs) and principal threat waste (PTW) threshold exceedances. Figures 23 through 37 present results inconsistently against screening levels, CULs, RALs, PTW thresholds, and non-PHSS ROD regional background. Since the purpose of this document is to evaluate recontamination potential of the PHSS ROD in-water remedy, revise the figures to consistently present sample results screened against the applicable CULs established in PHSS ROD Table 17. Additional contours/color bins can be added to the surface sediment figures for chemicals of potential concern (COPCs) with RALs and/or PTW thresholds.	Figures 24, 25, 30, 33, and 34 (re-numbered as Figures 28, 29, 45, 48, and 49 in revised report) have been revised to add screening against CULs.
Primary 2	Spatial Distribution of COPC Exceedances	--	The presence of elevated COPC exceedances in other locations and media of the Facility outside of areas of upland groundwater contamination does not necessarily mean that observed impacts are not spatially correlated or associated with adjacent and noted groundwater impact areas (i.e., the former log pond area). Provide additional rationale that explains how spatial distribution of COPC exceedances in other locations and media sampled negate, or diminish, the correlation seen between groundwater concentrations with sediment and porewater concentrations in the west parcel area. Absent this further explanation, EPA does not agree with the "lack of correlation" statements and conclusions. EPA also notes that the area offshore of the West Parcel is identified as erosional and as a result, the porewater samples are likely more representative of upland groundwater concentrations and less likely to be representative of concentrations imparted from deposited contaminated sediment.	Upon review, we agree that the discussion provided was confusing. The discussion has been revised to clarify the points intended to be made such as: • The presence of higher sediment concentrations in areas clearly not impacted by groundwater demonstrate that there are other sources of sediment impacts. • The presence of both higher groundwater concentrations and higher sediment concentrations does not confirm that one caused the other. In fact, in this case, other lines of evidence such as site history and elevated riverbank concentrations point to a common source to both groundwater and sediments. The discussion will be expanded to address implications of net erosion (primarily less than 2 feet over the study period).
Primary 3	Soil Porosity Values	--	EPA believes that the 0.4 assumption for the porosity of the various soil types present at the Facility (i.e., silt, silty sand, and sand) used in the groundwater velocity calculation is inappropriate. In addition, the document does not recognize or state that **effective** porosity for these soil types is what is being used, which is a separate porosity value representative of water released from the pore spaces in the context of groundwater movement. As a result, the porosity used in the velocity calculation presented in Table 3 is at the very high end of effective porosity published for these soil types. For the soil types present in the project area (i.e., silt, silty sand, and sand), effective porosity values ranging from 0.15 to 0.23 are more appropriate (Woessner and Poeter, 2020). Using these values in the calculation would result in higher groundwater velocities that need to be corrected throughout the subsequent calculations that utilize the groundwater velocity results and propagate into the mass flux and attenuation factor estimates.	We note that for the alluvial/fill soils without significant clay content that are present at the site, effective porosity is essentially the same as total porosity. However, we acknowledge that the value used was toward the higher end of typical ranges. We have revised the calculations using a value of 0.3 for porosity (we note that there were also a few of the calculations that did not get updated when additional water level data were incorporated – those calculations were also updated). These revisions were carried through the other calculations. The overall conclusions did not change.

Comment Response Matrix
Groundwater Source Control Evaluation Report and Groundwater Sampling Work Plan Scope Outline
Willamette Cove Uplands

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Reviewer Comment No.	Section Name/ Topic	Section/ Table/ Figure No.	EPA Comments 4/23/2024	Port Response/Action
Primary 4	Groundwater Velocities and River Level Effects	Section 6.3.5, Figure 17	The calculations performed in Section 6.3.5 to evaluate horizontal distances traveled for a theoretical water particle from a monitoring well at the Facility are oversimplified. EPA recommends the paragraph and associated figure (Figure 17) be removed from the document. The movement of water particles is a more complex evaluation than a simple cumulative summation of water movement based on the gradient condition between the river stage and a monitoring well. It is also unclear what conclusions are being made from this evaluation.	We agree that this is a simple model. However, we believe that these results provide an additional line of evidence supporting the overall groundwater flow model conclusions that groundwater flow is primarily to the river. Section 6.3.5 was revised to clarify how the model was used.
Primary 5	Attenuation Factors	--	The approach for developing attenuation factors appears to be biasing the attenuation factors high and should be reevaluated. Based on the groundwater flow net in Figure 22, it appears that the monitoring well groundwater samples and the sediment porewater samples used in the calculations were not collected from the same flow path. Based on Figure 22, the upland groundwater mass flux is based on monitoring wells screened in the shallow flow path, but the offshore sediment mass flux is based on porewater samples from locations representing a deeper flow path (>50 feet). To avoid the discordant flow paths and bias present in the calculation, porewater samples within 25 feet of the riverbank should be installed and sampled in the western area (i.e., the area of greatest COPC concentrations) or seep samples collected and these concentrations should be used for the mass flux in the river sediment to derive more representative attenuation factors along similar flow paths between upland groundwater and in-river discharge. This additional porewater sampling effort is consistent with the recommendation stated in Section 8.8 to collect additional samples between the West Parcel upland monitoring wells and the porewater sampling locations offshore of the West Parcel. Additionally, EPA requests that the upland party outline, in a simple decision logic diagram, the next steps based on the results of the future porewater sampling, including whether the additional, closer-to-shore sampling verifies the presence or absence of COPCs.	The section discussing attenuation was deleted from the updated report. Additional groundwater data were collected, and discussion of the results was added in Sections 5.1, 8.1, 8.2, 8.4, and 8.6. To support discussion of the additional groundwater data, a new Section 5.4 was added to the report discussing upland soil data.
Primary 6	Former Log Pond Area	--	Based on the information presented in this report, EPA believes the former log pond area in the western parcel could be a source of upland groundwater contamination that may be causing elevated COPC concentrations discharging to the river above ROD CULs. The former log pond area is not a naturally formed subsurface feature and its presence was introduced by past land use practices. As a result, the contaminants being introduced by this feature from groundwater flux and geochemical processes may be contributing to arsenic and other COPCs leaching. Due to the result of these processes and short flow paths to the river, additional analysis of COPCs identified in Table 4 (i.e., arsenic, carcinogenic polycyclic aromatic hydrocarbon (cPAHs; BaP eq), polychlorinated biphenyls (PCBs), and DDx) should be conducted as part of the planned porewater sampling to support a more robust evaluation of the potential impacts to the river.	Additional sampling of groundwater was conducted to address the uncertainty in potential groundwater impacts. The analyte list for the additional sampling will include arsenic, PAHs, PCBs, and DDx. Discussion of the results was added in Sections 5.1, 8.1, 8.2, 8.4, and 8.6. To support discussion of the additional groundwater data, a new Section 5.4 was added to the report discussing upland soil data.
To Be Considered 1	Conclusions	--	The conclusion section should include a summary table with quantitative lines of evidence and comparisons in the context of potential groundwater recontamination from upland sources. Revise discussions and conclusions for individual COPCs accordingly.	New Table 5 summarizes the results of the groundwater SCE conclusions.

Comment Response Matrix
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Willamette Cove Uplands

Comments from DEQ – Groundwater Source Control Evaluation Report				
Reviewer Comment No.	Section Name/ Topic	Section/ Table/ Figure No.	DEQ Letter, 6/12/2024	Port Response/Action
General 1	Overall Impression	--	Based on the CSM and site-specific data, DEQ considers the site to represents a low recontamination risk via groundwater discharge to the Willamette River. The relatively low to moderate concentrations detected in West Parcel upland wells and to a lesser extent porewater (which may contain contributions from sediment), do not currently appear to DEQ to be actionable in terms of implementing a upland source control measure.	This is consistent with our overall conclusions.
General 2	Proposed Supplemental Sampling	--	It is possible the additional sampling proposed will reduce areas of uncertainty regarding the groundwater pathway in the West Parcel area. Given the low concentrations under scrutiny (excepting arsenic but attributed to regional background levels) and intrinsic uncertainties in sampling collection methods, it is also possible that additional sampling may continue to yield inconclusive results. DEQ wants to recognize this potential outcome and if it occurs, should not distract from completion of the upland SCE. With that said, DEQ accepts the proposal to proceed with development of a West Parcel work plan.	Additional sampling of groundwater was conducted to address the uncertainty in potential groundwater impacts. Discussion of the results was added in Sections 5.1, 8.1, 8.2, 8.4, and 8.6. To support discussion of the additional groundwater data, a new Section 5.4 was added to the report discussing upland soil data.

Comments from DEQ – Groundwater Sampling Scope Outline				
Reviewer Comment No.	Section Name/ Topic	Section/ Table/ Figure No.	DEQ Email, 6/12/2024 Regarding Groundwater Sampling Scope Outline	Port Response/Action
General 1	Overall Impression	--	DEQ has some reservations regarding the value of additional sampling to assess the groundwater pathway to the river as proposed. Groundwater discharge to the river for this site poses a low recontamination potential including the West Parcel area. Two porewater sampling events have not provided definitive conclusions, in addition to upland groundwater monitoring data spanning many years. Additional sampling may likewise not provide resolution and the uncertainty that exists appears inconsequential given the low risk present based on multiple lines of evidence.	This is consistent with our overall conclusions. The additional sampling was conducted primarily in response to EPA Primary Comment 6: "EPA believes the former log pond area in the western parcel could be a source of upland groundwater contamination that may be causing elevated COPC concentrations discharging to the river above ROD CULs."
General 2	Proposed Sampling	--	Regarding a supplemental sampling work plan, DEQ recommends the following: • Preferably additional sampling activities and methodologies would build on the existing data set. This includes consistency with previous porewater sampling methods. • DEQ is concerned the sampling collection methods proposed may provide lower quality data than previously collected. Specifically, it is different methodology and is less refined. This may introduce uncertainty, particularly if the results are inconsistent or worse than the already existing data set. • Provide further justification for the proposed sampling depths. One approach would be additional shallow and deeper samples, and/or use of a spatial grid approach to capture groundwater to surface water (GW-SW) discharge. • The approach should provide confidence sampling will capture the actual groundwater flow path. To reduce the uncertainty, consider increasing sampling density within proposed borings (e.g., every five feet) for contaminants of potential concern (and geochemistry) to generate vertical profiles. For in-water borings, also consider additional shallow sampling depths consistent with previous porewater sampling activities (e.g., 0.5-1 and 1.5-2 feet bml).	The additional sampling was implemented under a work plan developed considering these comments, and the work plan was approved by the DEQ. For the additional sampling, note the following: • The primary intent was to collect data between the wells and the prior porewater sampling. Other than use of a temporary well screen (versus a permanent well screen at the wells), the sampling methods were consistent with the upland groundwater sampling. • The proposed methods were as consistent as possible with prior groundwater sampling. The only substantive difference is prior monitoring well samples were collected from permanent well screens and the additional samples were collected from temporary well screens.

Comment Response Matrix
Groundwater Source Control Evaluation Report and Groundwater Sampling Work Plan Scope Outline
Willamette Cove Uplands

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Specific 1	Proposed Sampling	--	To support proposed locations/rationale, the submittal would benefit from the inclusion of a figure with PDI and Supplemental PDI porewater sampling results offshore of the West Parcel in proposed sampling area, along with most recent results from upland wells MW-1, -2, and -3. The former are illustrated in Figures 4-7 and 4-17 of the respective PDI and SPDI reports.	The work plan included cross sections and plan views showing existing data and proposed sampling locations.
Specific 2	Proposed Sampling	--	In-water locations appear to be positioned directly downgradient of upland wells, rather than a more spatially oriented approach offshore of the Former Log Pond Fill Area. While the logic is noted, placing the locations between the existing porewater transects would provide better coverage of the offshore groundwater discharge area.	Sampling locations were selected in consideration of both well locations and existing porewater locations.
Specific 3	Proposed Sampling	--	Rationale for upland and in-water sampling depths is not well-articulated. Preferably, the sample depths would consider previous sampling depths (wells and porewater) and inferred GW-SW CSM. Currently: a. Upland: first water, 12' below, and 24' below b. In-water: 5' bml and 20' bml. Additional clarity is also needed to support that the targeted depths are consistent with the inferred groundwater flow paths and previous sampling depths. As noted in general comments, greater sampling density is recommended in each boring to increase confidence the groundwater flow path is intercepted and to better align with previous sampling activities.	The work plan included both cross sections and plan views to justify the location of samples.
Specific 4	Proposed Sampling	--	Sampling methodology identifies sonic for in-water but not upland borings, and "grab" groundwater samples for both efforts. Methodology should be further articulated. As noted above different sampling methods from previous porewater sampling can introduce uncertainty in the results.	Sonic drilling was used. Samples were collected by pushing a temporary screen ahead of the drill string.
Specific 5	Proposed Sampling	--	Text indicates "metals" analysis but individual elements are not specified. Other contaminants for which EPA (originally) expressed concern were not included. Please clarify. Also specify total and dissolved analysis for all sample analytes.	The additional sampling included arsenic, PAHs, PCBs, and DDx.
Specific 6	Proposed Sampling	--	Resampling of upland wells MW-1 to -3 is proposed. Presumably sampling would occur near or at the same time as the in-water work. DEQ recommends that monitoring well sampling occur prior to upland boring advancement to avoid saturated zone disturbance.	Sampling of wells occurred concurrently with (MW-1 and MW-2) and following (MW-3) the upland borings.
Specific 7	Proposed Sampling	--	Specify that parameters (temperature, DO, ORP, etc.) will be measured during sampling of the monitoring wells, upland borings, and in-water borings. These parameters are helpful to gauge whether the porewater is influenced more by groundwater or surface water. Suggest the use of a flow through cell during collection of grab samples to collect real-time parameter data.	Sampling included the listed field parameters as well as geochemical parameters (nitrate, manganese, ferrous iron, sulfate and carbon dioxide) to evaluate redox. The sampling technique included use of a flow through cell.
Specific 8	Proposed Sampling	--	It would be helpful if a figure would illustrate in plan view the anticipated boring termination location accounting for the 40-degree divergence from vertical.	The work plan figures included sample locations, including the locations accounting for the angled borings.