DEQ Comment Response Matrix
Annual 2022 Groundwater Monitoring and LNAPL Removal Report
Terminal 4 Slip 3

Reviewer Comment No.	Section Name/ Topic	Section/Table/ Figure No.	DEQ Comments (3/18/2023)	Port Response (5/12/2023)
General 1	--	--	DEQ appreciates the Port expanding the analyte list for selected monitoring wells in 2022. The detection of manganese at elevated concentrations in HC-12D, BE-1 and BE-5 is not an unexpected result for an upland petroleum terminal site in Portland Harbor. However, DEQ concurs that porewater data collected as part of the in-water Supplemental PDI may help inform the status of source control at Slip 3 and looks forward to seeing what conclusions (if any) can be drawn from them.	Comment noted.
Specific 2	Chemical Analytical Results	Section 5.1	DEQ notes that reporting limits (RLs) for C10-C12 aliphatic hydrocarbons differed significantly between the April 2022 and August/November 2022 sampling events, likely reflecting the different methods used for the analyses (i.e., Method 8015C vs. NWEPH Method). As a result, the RLs for the August and November 2022 sampling events exceeded the Portland Harbor Table 17 cleanup level (CUL) of 2.6 ppb (i.e., porewater CUL and admittedly a conservative screening standard for upland groundwater) by factors of approximately 8 and 15, respectively. Please add discussion to this section regarding why a consistent method for the petroleum fraction analyses was not used.	For analysis of C10-C12 aliphatic hydrocarbons, EPA method 8015 was utilized for the April 2022 groundwater sampling event. This method change from Northwest Extractible Petroleum Hydrocarbons (NWEPH) was recommended by the analytical laboratory to achieve the Portland Harbor Table 17 Cleanup Level (CUL); however, data quality issues were noted after receipt of this data. Results were reported as individual compounds n-decane, n-undecane, and n-dodecane and not as summed carbon ranges that is typical with NWEPH. Alkanes are only a portion of C10-C12 aliphatic hydrocarbons (missing alkenes and alkynes, straight and branched chains) and the reported results were assumed to be biased low. After review of the April data using EPA method 8015, the decision was made to use the NWEPH method in subsequent sampling events to ensure that all aliphatic hydrocarbons within the C10-C12 range were reported. Reporting limits for the NWEPH method do not meet the Table 17 Portland Harbor CUL for C10-C12 aliphatic hydrocarbons but, when detected, results reported are more representative of groundwater conditions. Several laboratories were contacted and the 2.6 micrograms per liter (µg/L) CUL is unachievable without substantial modifications to the NWEPH method. Section 5.1 was expanded to discuss analytical methods and detection limits in greater detail.
Specific 3	BEBRA Wells	Section 5.2.1	DEQ concurs with the Port in noting there is uncertainty in the slope of the regression line for diesel-range hydrocarbons in BE-1. This section should also note potential uncertainty in the data for BAA and BAP in BE-5 owing to variability caused by the high concentrations detected in December 2020 and low calculated R^2 values.	The text in Section 5.2.1 has been revised to note the uncertainty in the regression lines for BAA and BAP in samples collected from monitoring well BE-5.
Specific 4	LNAPL Monitoring and Removal	Section 6.1	DEQ concurs that the requirements of the LNAPL monitoring and removal program have technically been met but agrees with the Port's recommendation to continue annual LNAPL monitoring and recovery coincident with annual groundwater monitoring.	Comment noted.
Specific 5	Source Control Considerations	Section 6.3	a) Please provide the source for the cited background levels of arsenic, copper, and zinc in groundwater from the Willamette Valley. Water Resources Investigations Report 98-4205, published by the U.S. Department of Interior and U.S. Geological Survey in 1998, reported detections in the ≤10 ppb range for samples collected in the Portland metropolitan area. b) Please provide additional discussion regarding the "other mechanisms" referenced in this section, beyond reducing conditions related to the presence of petroleum hydrocarbons, that are potentially influencing metal concentrations in wells BE-1, BE-5 and HC-12D. These wells are in proximity to residual petroleum contamination addressed by the BEBRA and the Head of Slip 3 Cap, as well as a historical source area for petroleum hydrocarbons.	The references have been added and the text revised to remove "other mechanisms". In addition, because this report is related to the Upland Facility cleanup ROD and to remove any confusion, references to Portland Harbor ROD cleanup levels have been removed from the report.

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Specific 6	Recommendations for Additional Monitoring	Section 6.4	Section 6.4 Recommendations for Additional Monitoring – Due to the detection of elevated levels of manganese in HC-5, HC-12D, BE-1 and BE-5, DEQ requests that these wells also be sampled semi-annually in 2023 (i.e., and for the expanded analyte list), similar to the monitoring proposed for wells HC-2 and HC-6S.	The text has been revised to include semiannual monitoring and sampling in 2023 of monitoring wells HC-5, HC-12D, BE-1 and BE-5 with the expanded analyte list. No sampling is recommended for wells HC-2 and HC-6S based on the 2022 results.