EPA Assessment of PDI/BL Data Uses

General Comment:

The pre-design investigation and baseline sampling (PDI/BL) program was overall a very well-designed and implemented study due to the collaboration between the Pre-RD Group and EPA. The new data are a comprehensive and incredibly useful both during remedy design and remedial action and as a baseline record that EPA will incorporate into the existing Portland Harbor Superfund Site (site) database that will be compared against future long-term monitoring data to assess the success of the selected remedy. As discussed further below, during remedial design and remedial action, these data will assist in the refinement of sediment management areas (SMAs), inform site-specific remedial technology selections, contribute to the understanding of fish behavior and tissue concentrations, and aid in the sequencing of active remediation.

EPA appreciates all the hard work and time that went into collecting these data and look forward to their current and future uses consistent with the site Record of Decision objectives for informing remedial design and remedial action as well as the overarching remedial design principles articulated below.

Remedial Design Principles:

The following remedial design principles were developed to assure all parties working on remedial designs at the Site have a common understanding of these topics. The remedial design principles will be incorporated in the Remedial Design Guidelines and Considerations document and are meant to supplement, not supersede or revise, the ROD.

1) *Sediment Management Area:* According to Section 10.1 of the ROD, "sediment management areas (SMAs) were identified as areas where containment or removal technologies were considered to immediately reduce risks upon implementation." A SMA is where active remediation versus natural recovery will be performed as selected in the ROD. As further described in the ROD, a SMA will be delineated by surface and subsurface contamination above remedial action levels (RALs) and where exposure is occurring or has the potential for exposure. Through the remedial design process and with more detailed remedial design sampling, estimated SMAs identified in the ROD will be further refined and ROD technologies will be applied through application of the decision tree as discussed in No. 4 below.

2) *Buried Contamination*: In some areas, sediment contaminants of concern (COCs) that exceed the RAL may be buried beneath surficial sediments that are cleaner than the RAL trigger. Whether or not these areas will be included in an SMA is dependent on the chemical and physical stability of the buried material. During remedial design, site-specific information will be developed by performing parties to assess whether the sediments with COC concentrations exceeding the RAL are likely to be exposed or if porewater COCs exceeding groundwater cleanup levels are likely to advect to the sediment surface. The assessments will address the physical and chemical stability of the buried contamination based on the following factors, but not limited to: erosion/scour potential, chemical concentration compared to RAL thresholds, depth of contamination, and advective transport. The remedial action applied to these areas will involve planning and implementing a long-term monitoring program to confirm site-specific determinations on deposit stability and chemical isolation.

3) *Data Replacement*: Performing parties in remedial design will develop their own site-specific data replacement strategy and the strategy must meet reasonable statistical standards and considerations. These considerations will include, but not limited to: presence of outliers, unbiased sampling approach, heterogeneity of the substrate, natural recovery occurrence, deposition, erosion/scour potential, sampling density /resolution, and age of the data.

The use of updated data to replace older data is not precluded. Whether replacement is warranted will be determined on a site- and location-specific basis, recognizing that subsurface data tied to an elevation is unlikely to need replacement. Surface data replacements need to consider differences in the sample dates and locations between sample pairs. In general, older surface samples that are in close proximity to newer samples are reasonable candidates for replacement if the new sample was taken much more recently than the older surface sample.

4) *Technology Assignment*: When determining the remedial technologies to apply in a certain area, the ROD decision tree should be applied, and a remedy selected that is consistent with the ROD's design requirements outlined in Section 14.2.9. The ROD decision tree contains flexibility in the application of remedial technologies, for example, by specifying "dredge and/or cap" in some areas of the intermediate zone. In areas with this type of flexibility, approaches should be selected based on an analysis of the chemical, physical, and anthropogenic features and the compatibility with dredging or capping. In some areas where the decision tree specifies a technology, EPA retains the flexibility to modify that outcome if there are site-specific circumstances that preclude the feasible implementation of the approach. For example, capping is specified under functional structures, but in some cases the construction of a cap may not be feasible (for example, on over-steepened slopes where cap materials would not be stable). Performing parties need to develop the necessary site-specific information and considerations to be incorporated under the remedial design process for final remedial technology assignments.

<u>Media-Specific Data Uses:</u>

Bathymetry:

- The 2018 bathymetry survey was the first one conducted since 2009 and updated EPA's understanding of the river bed elevations. These new data will be used during remedial design along with the older surveys to understand site-specific changes in sediment deposition and erosion at small spatial scales over time. Additionally, the 2018 survey will help inform remedial technology selection, identify possible construction difficulties such as steep slopes, and understand how sediment deposition affects flood rise.

Surface Sediment:

- A total of 714 surface sediment samples were collected in the site and upstream during the PDI/BL sampling and provide invaluable new information on contaminant concentrations in the biologically active zone. During remedial design, these new data along with data from additional samples collected during remedial design will be used to refine the SMAs and select appropriate remedial technologies. Additionally, the unbiased surface sediment samples will serve as the baseline record to compare the success of the remedy against during long-term monitoring. This baseline record is invaluable to ensure that the cleanup is functioning as intended.

Subsurface Sediment Cores:

- A smaller number of subsurface sediment cores were collected during the PDI/BL sampling targeting depths of 5 to 15 feet below the river bottom. Since contamination exists in both the surface and subsurface sediment, it is essential to understand the depth of contamination for both risk and cost. The PDI/BL subsurface sediment cores will be used along with additional samples collected during remedial design to delineate the SMAs at depth, select appropriate remedial technologies, estimate volumes of dredge material for disposal, and determine what the costs of remedial action will be.

Sediment Traps:

- The upstream sediment traps deployed during the PDI/BL sampling provided an updated understanding of possible contamination entering the site from upstream. These data also demonstrate how tidal flow reversals in the lower Willamette River can cause contamination in the site to smear upstream. During remedial design, the PDI/BL sediment trap data will be helpful in determining the sequencing of dredging and capping operations by providing an understanding of the fate and transport of suspended sediment concentrations during seasonal river stage conditions.

Surface Water:

- The PDI/BL surface water data are an invaluable aspect of the baseline record for Portland Harbor. Attaining surface water cleanup levels (CULs) may take longer than the sediment CULs due to the complexity of the site and other watershed effects. The PDI/BL surface water sampling will be repeated as a part of the long-term monitoring program to assess the progress towards attaining surface water CULs.

Smallmouth Bass Fish Tissue:

- Smallmouth bass are an indicator species in Portland Harbor and are one of the many species consumed by people in the region. The PDI/BL fish tissue data are an invaluable aspect of the baseline record for Portland Harbor and represent a statistically robust dataset. These data will be used during remedial design to inform technology selection in nearshore areas and will be compared against future data collected during long-term monitoring to assess the success of the remedy.

Acoustic Fish Tracking Study:

- The size of smallmouth bass home ranges represents a midpoint for the different species in the site that are consumed by people. The PDI/BL acoustic fish tracking study was a large-scale deployment of a relatively new technology and provides fine-scale location data for individual fish. The improved understanding of fish movement behavior obtained with these data confirm the use of smallmouth bass as an indicator species and will be essential during remedial design. The data can be used to inform technology selection in nearshore areas (e.g., around structures),

material selection in the design of caps and river bank remedies, and best management practices during remedy construction.

Background Porewater:

- The PDI/BL porewater study represents the first attempt at understanding background concentrations of arsenic and manganese in the lower Willamette River. These two compounds occur naturally in the volcanic soils of the watershed and dissolved concentrations are sensitive to the amount of oxygen present. These data will be used during remedial design to understand whether arsenic and manganese in porewater may be due to natural processes or can be attributed to human activity. Additionally, with further study conducted during remedial design, the groundwater CULs for arsenic and manganese may be adjusted to background or another regulatory criterion.

Dioxin/Furan Data Uses

The PDI/BL sediment, surface water, and fish tissue data provide a comprehensive sitewide and upstream dataset for dioxins/furans. This represents a significant improvement in the spatial resolution of the existing dioxin/furan data at the site and will greatly aid in the delineation of SMAs with dioxin/furan contamination during remedial design, allow for better understanding of the spatial relationship between sediment and fish tissue concentrations, provide an update on dioxins/furans in suspended and settleable sediments in the water column, and establish a comprehensive baseline record for the long-term monitoring program.