Figure 3-2. Intertidal habitat and crab and shrimp sampling locations in the Lower Duwamish Waterway.
Figure 3-4. Benthic invertebrate community and sediment toxicity test sampling locations in the Lower Duwamish Waterway.
Samples associated with location numbers shown on this map are listed in Map Table 3 of the Phase 1 RI map folio.

Figure 3-5. Historical LDW tissue sampling locations

Prepared by RAC 12/30/03  Map 1218

W:\Projects\00-08-06_Duwamish_RI\data\gis\Phase2\SurfaceUpdate\Updated 122203

Windward Environmental
TOD normalization conducted for all samples with TOD concentrations greater than 0.2%. For samples with 0.2% TOD or lower or missing TOD concentrations, chemical concentrations were compared to lower AEI (equivalent to SQS) and second lowest AEI (equivalent to CSL) in dry weight units.

If both detected concentrations and detection limits exceed SQS or CSL at a location, only the exceedance associated with the detected concentration is shown.

Source information provided by EPA and Ecology based on a preliminary file search.

Historical ore pile
Historical cement plant\n
Proposed Phase 2 sample location
Historical surface sediment chemistry data
Locations where only PCBs measured
- sSQS, detected
- >sSQS and sCSL, detected
- >CSL, detected

Locations with multiple chemical groups
- >sSQS/SL and sCSL/ML, non-detect
- >CSL/ML, non-detect
- >sSQS/SL and sCSL/ML, detected
- >CSL, detected

Intertidal
Early action area
Tax parcel
Outfalls
- EPC, CSO, or CSO/SD
- Publicly-owned storm drain
- Pipe of unknown origin
- Stream, channel, or swale
- Seep
- Navigation channel
- River Mile

Figure 3-8a. Surface sampling locations for Phase 2 RI and historical surface sediment chemistry data (RM 0 - 1.2)

Pipes and seeps shown on the map were identified during a City of Seattle survey conducted during May-June 2003. The survey identified pipes and seeps using digital maps and aerial or surface properties (e.g., floating stuff on surface)

Prepared by: RAC 12/22/03 Map 1184

Historical cement plant:
- Log transfer facility
- PCB fill site at historic sewage treatment plant,
- COE/SPA cleanup of Slip 1 sediment

Current use - Military metal work, hazardous wastes received here; 1974 PCB spill and cleanup

Hazardous wastes received here:
- 1974 PCB spill and cleanup

Prepared by RAC 12/22/03 Map 1184

 prohibited from use
Figure 3-8d. Surface sampling locations for Phase 2 RI and historical surface sediment chemistry data (RM 3.6 - 4.9)

Toc concentrations considered for all samples with Toc concentrations greater than 0.2%. For samples with Toc >0.2%, or below or missing Toc concentrations, chemical concentrations were converted to lowest ACT (equivalent to Toc) and second lowest ACT (equivalent to Cu) in dry weight units.

For detected concentrations and detections for all measured SdG or Cu, see Table 3.2. Only the exceedance associated with the detected concentration is shown.

Outfall:
- EFO, CSOs, or CSO/SD
- Publicly-owned storm drain
- Pipe of unknown origin
- Stream, channel, or swale
- Seep
- Navigation channel
- River Mile

Phase and ages shown on the map were identified during a City of Seattle survey conducted during May-June 2003. Precipitation data was obtained from seven storm drains monitoring stations located throughout Seattle. Ternary plots were used to identify potential contamination. Sites identified for further investigation are those associated with the highest potential for contamination.

Proposed Phase 2 sampling locations:
- Historical surface sediment chemistry data
- Locations where only PCNs measured
- SQS, detected
- >SQS and LSCS, detected
- <LCS, detected
- Locations with multiple chemical groups
- SQS/LCS detected
- SQS/LCS and GLC/LCS non-detected
- >SQS/LCS detected
- >SQS/LCS and <SQS/LCS detected
- CSL, detected
- Further analysis
- Early action area
- Tax parcel

Historic fill with possible pollutants

Historic shipyard and metal scrap facility

SLIP 6

Turning Basin 3

Methane: PAHs, metals, pyridines, TBT
Figure 3-9. Phase 2 surface sediment sampling locations to be analyzed for organochlorine pesticides and historical DDT data

- Proposed Phase 2 sample location
- Historical sediment chemistry data
  - Total DDTs (µg/kg dw, non-detect)
    - ≤6.9 (≤SL)
    - >6.9 - 69 (>SL and ≤ML)
    - >69 (>ML)
  - Total DDTs (µg/kg dw, detected)
    - ≤6.9 (≤SL)
    - >6.9 - 69 (>SL and ≤ML)
    - >69 (>ML)
- River Mile
- Feet
- Meters
Detection limits for concentrations reported as undetected were assigned a value of half for the purpose of data aggregation.
Figure 3-11. Phase 2 surface sediment sampling locations to be analyzed for TBT and historical TBT data.

Proposed Phase 2 sample location

Historical sediment chemistry data

Tributyltin (µg/kg as ion, dry wt., detected)

- 1.0 - 20.0
- 20.1 - 50.0
- 50.1 - 100.0
- 100.1 - 200.0
- >200.0

Tributyltin (µg/kg as ion, dry wt., non-detect)

- 1.0 - 20.0
- >20.0

River Mile
Source information provided by EPA and Ecology based on a preliminary file search.

Detection limits for concentrations reported as undetected were based on the lowest quantification limit (QSL) of detection. Locations where only PCBs measured are noted.

<table>
<thead>
<tr>
<th>Location ID</th>
<th>Depth (ft)</th>
<th>PCBs (µg/kg dw)</th>
<th>BEHP (µg/kg dw)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1055</td>
<td>0-3.0</td>
<td>1840</td>
<td>1400</td>
</tr>
<tr>
<td>1054</td>
<td>0-3.0</td>
<td>1900</td>
<td>1500</td>
</tr>
<tr>
<td>1053</td>
<td>0-3.0</td>
<td>1950</td>
<td>1600</td>
</tr>
<tr>
<td>1055</td>
<td>0-3.0</td>
<td>2090</td>
<td>1500</td>
</tr>
<tr>
<td>1054</td>
<td>0-3.0</td>
<td>2150</td>
<td>1600</td>
</tr>
<tr>
<td>1053</td>
<td>0-3.0</td>
<td>2200</td>
<td>1700</td>
</tr>
<tr>
<td>1055</td>
<td>0-3.0</td>
<td>2250</td>
<td>1700</td>
</tr>
<tr>
<td>1054</td>
<td>0-3.0</td>
<td>2300</td>
<td>1800</td>
</tr>
<tr>
<td>1053</td>
<td>0-3.0</td>
<td>2350</td>
<td>1800</td>
</tr>
<tr>
<td>1055</td>
<td>0-3.0</td>
<td>2400</td>
<td>1900</td>
</tr>
</tbody>
</table>

Past use - Military metal work; hazardous wastes received here; 1974 PCB spill and cleanup

PCB fill site at historic sewage treatment plant, COE/EPA cleanup of Slip 1 sediment

Currently used for barge loading and unloading; evidence of erosion at low tide; historic sawmill, log rafts

Figure 3-13a. Phase 2 subsurface sediment sampling locations, and historical surface and subsurface chemistry data (RM 0-1.2)
场所的定义和位置

- 柱状图显示了污染物的分布情况。
- 比值图展示了污染物浓度的相对变化。
- 坐标图提供了准确的位置信息，便于进一步研究。

地点的描述与显示

- 地点1: 柱状图显示了污染物的分布情况。
- 地点2: 比值图展示了污染物浓度的相对变化。
- 地点3: 坐标图提供了准确的位置信息，便于进一步研究。
Figure 3-13c. Phase 2 subsurface sediment sampling locations, and historical surface and subsurface chemistry data (RM 2.4 - 3.6)

TOC normalization conducted for all samples with TOC concentrations greater than 0.2%. For samples with 0.2% TOC or lower, TOC content is reported as parent material. Chemical concentrations are reported as lowest AET (equivalent to SQS) and second lowest AET (equivalent to CSL) in dry weight units.

Detection limits for concentrations reported as untested were assigned a value of zero for the purpose of data aggregation.

Source information provided by EPA and Ecology based on a preliminary file search.

The overall information provided by Seattle Public Utilities, May 2002. Some tox polar polygons were edited by Interview to conform to the LDW shoreline for the purpose of map presentation.

Pipes and seeps shown on the map were identified during a City of Seattle survey conducted during May-June 2003. Pipe locations were first identified using drainage maps for many of the waterfront properties derived from Ecology WPASO industrial stormwater permit files and property owners. Pipe locations explored during the field work were those that appeared to be dangerous or hazardous. Some of the pipes may no longer be active. The pipes identified on the map are visible during the survey, but pipe identification was not the primary objective of the survey. Other pipes not noted on the map probably do exist.
Source information provided by EPA and Ecology based on a preliminary file search.

Detection limits for concentrations reported as undetected were 0.2% TOC or lower or missing TOC concentrations, chemical concentrations were compared to TOC normalization conducted for all samples with TOC concentrations greater than 0.2%. For samples and subsurface chemistry data (RM 3.6 - 4.9)

**Outfalls**
- Historical subsurface chemistry sampling locations
- Surface locations with multiple chemical groups
- <SQS/SL, <SSS, and <CSL/ML, detected
- >CSL/ML, detected
- Surface locations where only PCBs measured
- >SQS, detected
- >SSS and >CSL, detected
- >CSL, detected
- Historic subsurface chemistry sampling locations
- Subsurface location
  - Intertidal
  - Early action area
- Outfalls
  - EOF, CSO, or CSO/SD
  - Publicly-owned storm drain
  - Pipe of unknown origin
  - Stream, channel, or swale
  - Seep
  - Navigation channel
  - River Mile

**Location #** | **Depth** (ft) | **PCBs (µg/kg dw)** | **BEHP (µg/kg dw)**
---|---|---|---
786 | 0-2.0 | 832 | 160
786 | 2.0-4.0 | 227 | 470
850 | 0-2.0 | 37 | 370
850 | 2.0-4.0 | 108 | 650

Dredging conducted for all samples with TOC concentrations greater than 0.2%. For samples with 0.2% TOC at or lower or missing TOC concentrations, chemical concentrations were compared to stored NRT (equivalent to SQS) and stored lower level NRT (equivalent to CSL in dry weight and)

Detection limits for concentrations reported as undetected were assigned a value of zero for the purposes of data aggregation.

Source information provided by EPA and Ecology based on a preliminary file search.

The proposed Phase 2 sample location

Historical surface sediment chemistry data

Surface locations with multiple chemical groups

- <SQS/SL, <SSS, and <CSL/ML, detected
- >CSL/ML, detected

Surface locations where only PCBs measured

- >SQS, detected
- >SSS and >CSL, detected
- >CSL, detected

Historical subsurface chemistry sampling locations

- Subsurface location
  - Intertidal
  - Early action area
- Outfalls
  - EOF, CSO, or CSO/SD
  - Publicly-owned storm drain
  - Pipe of unknown origin
  - Stream, channel, or swale
  - Seep
  - Navigation channel
  - River Mile

**PCBs (µg/kg dw)** | **BEHP (µg/kg dw)**
---|---
812 | 0-2.0 | 97 | 340
812 | 2.0-4.0 | 210 | 650
5405 | 0.4-1.0 | 60 | 340
5403 | 0.4-0.0 | 22.8 | 60
5404 | 0.0-4.0 | 94 | 330
835 | 0-2.0 | 40U | 140
835 | 2.0-4.0 | 40U | 140
1088 | 0.1-0 | 80 | 1400
1088 | 1.0-2.0 | 15U | 130
1088 | 2.0-3.0 | 16U | 20
1088 | 3.0-3.9 | 16U | 24

Proposed Phase 2 sample location

Historical surface sediment chemistry data

Surface locations with multiple chemical groups

- <SQS/SL, <SSS, and <CSL/ML, detected
- >CSL/ML, detected

Surface locations where only PCBs measured

- >SQS, detected
- >SSS and >CSL, detected
- >CSL, detected

Historical subsurface chemistry sampling locations

- Subsurface location
  - Intertidal
  - Early action area
- Outfalls
  - EOF, CSO, or CSO/SD
  - Publicly-owned storm drain
  - Pipe of unknown origin
  - Stream, channel, or swale
  - Seep
  - Navigation channel
  - River Mile

Figure 3-13d. Phase 2 subsurface sediment sampling locations, and historical surface and subsurface chemistry data (RM 3.6 - 4.9)

PCBs and seeps shown on the map were identified during a City of Seattle survey conducted during May-June 2003

Pipe locations were first identified using dynamic maps for many of the wetland properties. The pipes were then surveyed in the field. The status of the pipes found during the survey has not been confirmed. Some of the pipes may no longer be active. Those pipes identified on the map were visible during the survey, but their identification was not the primary objective of the survey. Other seeps not noted on the map probably do exist.
Figure 3-13e. Phase 2 subsurface sediment sampling locations, and historical surface and subsurface chemistry data (RM 4.2 - 5.8).

- Proposed Phase 2 sample location
- Historical surface sediment chemistry data
  - Surface locations with multiple chemical groups
    - ≤SQS, detected
    - ≤SQS/SL and ≤CSL/ML, detected
    - ≤CSL, detected
  - Surface locations where only PCBs measured
    - ≤SQS, detected
    - ≤SQS/SL and ≤CSL, detected
    - ≤CSL, detected
- Historical subsurface chemistry sampling locations
  - Subsurface location
    - Intertidal
    - Early action area
- Outfalls
  - EDF, CSO, or CSO/SD
  - Publicly-owned storm drain
  - Pipe of unknown origin
  - Stream, channel, or swale
  - Sewp
  - Navigation channel
  - River Mile

TAX parcel information provided by Seattle Public Utilities, May 2002. Source information provided by EPA and Ecology based on a preliminary file search. Some tax parcel polygons were edited by Windward to conform to the LDW shoreline for the purpose of map presentation.

Detection limits for concentrations reported as underdetected were assigned a value of zero for the purpose of data aggregation.

Source information provided by EPA and Ecology based on a preliminary file search.

*OC normalization conducted for all samples with TOC concentrations greater than 0.2%. For samples with 0.2% TOC or lower or nearing TOC concentrations, chemical concentrations were compared to solvent AET (equivalent to SQS) and second lowest AET (equivalent to CSL) in dry weight units with 0.2% TOC or lower or missing TOC concentrations, chemical concentrations were compared to TOC normalization conducted for all samples with TOC concentrations greater than 0.2%.

Pipes and seeps shown on the map were identified during a City of Seattle survey conducted during May-June 2003.

Pipes locations were first identified using drainage maps for many of the waterfront properties obtained from Ecology WARES (warehouse) and property owners. Pipeline locations exposed during low tides were then surveyed in the field. However, the status of the pipes found during the survey has not been confirmed. Some of the pipes may no longer be active. The seeps identified on the map were visible during the survey, but seep identification was not the primary objective of the survey. Other seeps not noted on this map probably do exist.
Figure 4-1. Phase 2 RI/FS schedule