

**From:** [Kristin Anderson](#)  
**To:** [Schwarz, Julia \(ECY\)](#); [Ansari, Mahta \(ECY\)](#); [Carp, Brett \(ECY\)](#)  
**Cc:** [Kapoi, Christina](#); [Ezzard, Lanelle](#); [Lynn Grochala](#); [Dan Hennessy](#)  
**Subject:** Silver Bay Logging Site- RI field adjustment summary  
**Date:** Friday, October 11, 2024 5:35:52 PM  
**Attachments:** [Figure 6.9 Proposed Groundwater Investigation adjustment 10.11.24.pdf](#)  
[Figure 6.10 Proposed Soil Investigation adjustment 10.11.24.pdf](#)  
[Table C.3 adjustment 10.11.24.pdf](#)  
[Table C.4 adjustment 10.11.24.pdf](#)  
[Table C.5 adjustment 10.11.24.pdf](#)  
[Table C.2 adjustment 10.11.24.pdf](#)

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## External Email

Hi Julia,

Below and attached are materials summarizing our proposed approach to mitigate the access constraints on the Site due to a large (1,000+ cubic yard) waste pile of gypsum backing paper that belongs to the property tenant. The tenant has not made any progress to export the material and we do not believe they will do so before they are relocated by SPU in the next ~1 year.

The following proposed sample locations are currently beneath the pile:

- proposed soil borings FS-17 and FS-28
- existing wells MW-08 and MW-09

During the utility location today, we additionally found that a sewer line runs east-west along the north side of the waste pile. Due to the sewer line, we will need to install FS-14 at its original work plan location rather than moving this boring to the southeast as discussed. In light of this, we're proposing an additional well to fill the groundwater monitoring objectives, which is discussed in more detail below.

The revised sampling plan is summarized here by location and also illustrated in the attached figure and table markups.

- FS-28: this boring was intended to characterize general fill soil quality, potential impacts from residual petroleum contamination left in interim action area A5A, and potential impacts related to slug bait handling operations. In its place, adjacent contingency boring FS-29 will be sampled and analyzed immediately according to the plan for FS-28 (refer to Figure 6.10 and Tables C.4 and C.5 for details regarding sampling and analysis)
- FS-17: this boring was intended to characterize potential soil impacts related to boat building (specifically in the vicinity of the current building in the southern part of the property) and slug bait handling. The objectives of this boring will still be adequately filled for the purposes of the RI/FS as follows (refer to Figure 6.10):
  - potential boat building impacts in the vicinity of the building will be characterized by FS-16, FS-18, FS-19 and FS-21

- potential slug bait handling impacts will be characterized by FS-15, FS-16 and FS-36 as well as by immediate analysis at boring FS-29 described above
- MW-08: this existing well was intended to characterize groundwater impacts from metals, TPH and CVOCs and to collect contaminant partitioning and hydrogeologic data. In its place, an additional well is proposed at the FS-14 boring location downgradient of MW-08 (refer to Figure 6.10). This new well (MW-22) will be installed with a screened interval spanning the water table consistent with MW-08 and sampled and analyzed according to the plan for MW-08; soil samples will be collected in accordance with the RIWP for FS-14 (refer to Figure 6.9 and Tables C.2 through C.5 for details regarding sampling and analysis).
- MW-09: this existing well was intended to characterize groundwater impacts from metals, TPH and CVOCs; to characterize potential impacts related to A5A, boat building and slug bait handling; and to collect contaminant partitioning and hydrogeologic data. In its place, an additional well is proposed at the FS-23 boring location downgradient of MW-09 (refer to Figure 6.10). This new well (MW-23) will be installed with a screened interval spanning the water table consistent with MW-09 and will be sampled and analyzed according to the plan for MW-09; soil samples will be collected in accordance with the RIWP for FS-23 (refer to Figure 6.9 and Tables C.2 through C.5 for details regarding sampling and analysis).

Additionally per RIWP Section 6.3, the need for additional remedial investigation to better define screening level exceedances or characterize hot spots will be evaluated in coordination with Ecology after receipt of the initial RI soil and groundwater data.

Thanks,

**Kristin Anderson, LHG Senior Geologist (she/her)**

**FLOYD | SNIDER**

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**From:** [Kristin Anderson](#)  
**To:** [Schwarz, Julia \(ECY\)](#)  
**Cc:** [Ansari, Mahta \(ECY\)](#); [Carp, Brett \(ECY\)](#); [Christina Kapoi](#); [Ezzard, Lanelle](#); [Lynn Grochala](#); [Dan Hennessy](#)  
**Subject:** Re: Silver Bay Logging Site- utility locate update  
**Date:** Monday, October 14, 2024 1:28:36 PM

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External Email

Hi Julia, your interpretation is correct. The original MW-01 location was installed in 2003 and the stormwater treatment system was installed in the same area in 2009. The flood control infrastructure was added more recently, after the RIWP was finalized.

I'm at the site today but I can send a composite markup tomorrow.

Thanks,  
Kristin

On Oct 14, 2024, at 12:06 PM, Schwarz, Julia (ECY) <[jusc461@ecy.wa.gov](mailto:jusc461@ecy.wa.gov)> wrote:

Hi Kristen,

Thank you for the additional updates following utility locates. With regards to the location of MW-01R, if you cannot put in the replacement well closer to MW-01, then the proposed location is acceptable. However, it seems like previous work has been able to place a well and a boring near the shoreline area in the vicinity of MW-01. Can you please explain why it is not possible to place a replacement well within 10 feet of the original well location? Is it because of more recently installed stormwater infrastructure, and if so, when was this infrastructure installed?

Also, please provide Ecology with a combined version of this figure with the new wells MW-22 and MW-23, so that this is a compilation of all field changes proposed thus far.

Thanks,  
Julia

**Julia Schwarz**, LHG (she/her)  
Site Manager, Toxics Cleanup Program  
Department of Ecology Northwest Region Office

Cell: 425-515-5992

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**From:** Kristin Anderson <Kristin.Anderson@floydsnider.com>

**Sent:** Friday, October 11, 2024 6:15 PM

**To:** Schwarz, Julia (ECY) <jusc461@ECY.WA.GOV>; Ansari, Mahta (ECY) <MAHT461@ECY.WA.GOV>; Carp, Brett (ECY) <brec461@ECY.WA.GOV>

**Cc:** Kapoi, Christina <Christina.Kapoi@seattle.gov>; Ezzard, Lanelle <lanelle.ezzard@hdrinc.com>; Lynn Grochala <Lynn.Grochala@floydsnider.com>; Dan Hennessy <Dan.Hennessy@floydsnider.com>

**Subject:** Silver Bay Logging Site- utility locate update

External Email

Hi Julia,

I have an additional update to share with you after completing the utility locates today. All of our soil boring locations were fortunately able to be placed within ~5 feet of their proposed RIWP locations. We were also generally able to site the wells as proposed, with a couple moves as summarized below and shown on the attached markup. We did not have to remove any locations due to utility conflicts.

MW-14 and MW-15 both had minor moves to the north (approximately 15 feet) due to interfering utilities. This will not impact the achievement of DQOs:

MW-14

- extent of TPH in groundwater surrounding MW-03R and MW-10
- general groundwater quality relative to CVOCs
- groundwater quality in the former treated wood storage area
- upgradient groundwater quality
- contaminant partitioning
- hydrogeology (groundwater elevations)

MW-15

general groundwater quality relative to CVOCs

• upgradient groundwater quality

• contaminant partitioning

• hydrogeology (groundwater elevations)

A larger move at MW-01R (approximately 40 feet to the southeast) was necessitated by sewer pipes/outfalls, above- and below-ground stormwater treatment infrastructure, and recently constructed flood control infrastructure along the top of the riverbank. There are not any concerns for achieving most of the DQOs at the new location, including:

- general groundwater quality relative to metals and CVOCs
- potential impacts from historical boat-building/repair in the east-central portion of the property
- general quality of groundwater discharges to surface water
- contaminant partitioning
- hydrogeology (groundwater elevations)

Our only concern with the new MW-01R location is further investigating the total DRO+ORO impacts that were previously detected at MW-01. However, the new location in combination with MW-12 and new well MW-21 will give good information regarding the extents and potential source of those impacts, therefore we don't have concerns relative to RI/FS at this time.

Thanks and have a great weekend,

**Kristin Anderson, LHG Senior Geologist (she/her)**

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Location	Data Quality Objective <sup>(4)</sup>												
	1	2	3	4	7	8	9	10	11	12	13		
MW-01R	X	X	X		X				X	X	X		
MW-03R	X	X	X					X		X	X		
MW-05	X		X						X		X		
MW-05D			X						X		X		
MW-06			X					X			X		
MW-07	X	X		X					X		X		
MW-08	X	X	X							X	X		
MW-09	X	X	X	X	X		X			X	X		
MW-10	X		X					X			X		
MW-11	X	X	X						X	X	X		
MW-12		X	X	X					X		X		
MW-13	X	X	X					X			X		
MW-14		X	X		X			X	X	X	X		
MW-15			X		X			X		X	X		
MW-16			X		X			X		X	X		
MW-17			X					X		X	X		
MW-18			X		X			X		X	X		
MW-19			X		X				X	X	X		
MW-20	X	X	X	X					X		X		
MW-21	X	X	X						X		X		
MW-22	X	X	X							X	X		
MW-23	X	X	X	X	X		X			X	X		

MW-8 and MW-9 DQOs filled by proposed MW-22 and MW-23:  
 -metals in groundwater (DQO-1)  
 -TPH in groundwater (DQO-2)  
 -CVOCs in groundwater (DQO-3)  
 -remedial action area soil (DQO-4)  
 -boat building (DQO-7)  
 -slug bait handling (DQO-9)  
 -contaminant partitioning (DQO-12)  
 -hydrogeology (DQO-13)

Notes:  
 1. Approximate shoreline based on Condition Assessment Report (HDR 2022).  
 2. Details regarding previous remedial excavations are provided in construction completion reports prepared by The Riley Group, Inc. (RGI 2017, RGI 2018, RGI 2019).  
 3. Overall groundwater flow direction was determined from tidal studies conducted by the Riley Group (RGI 2016).  
 4. Refer to Table 6.1 for details regarding data quality objectives.  
 · Parcel boundaries obtained from King County, 2020.  
 · Orthomimagery obtained from Nearmap, 2021.

Abbreviation:  
 RI/FS = Remedial Investigation/Feasibility Study

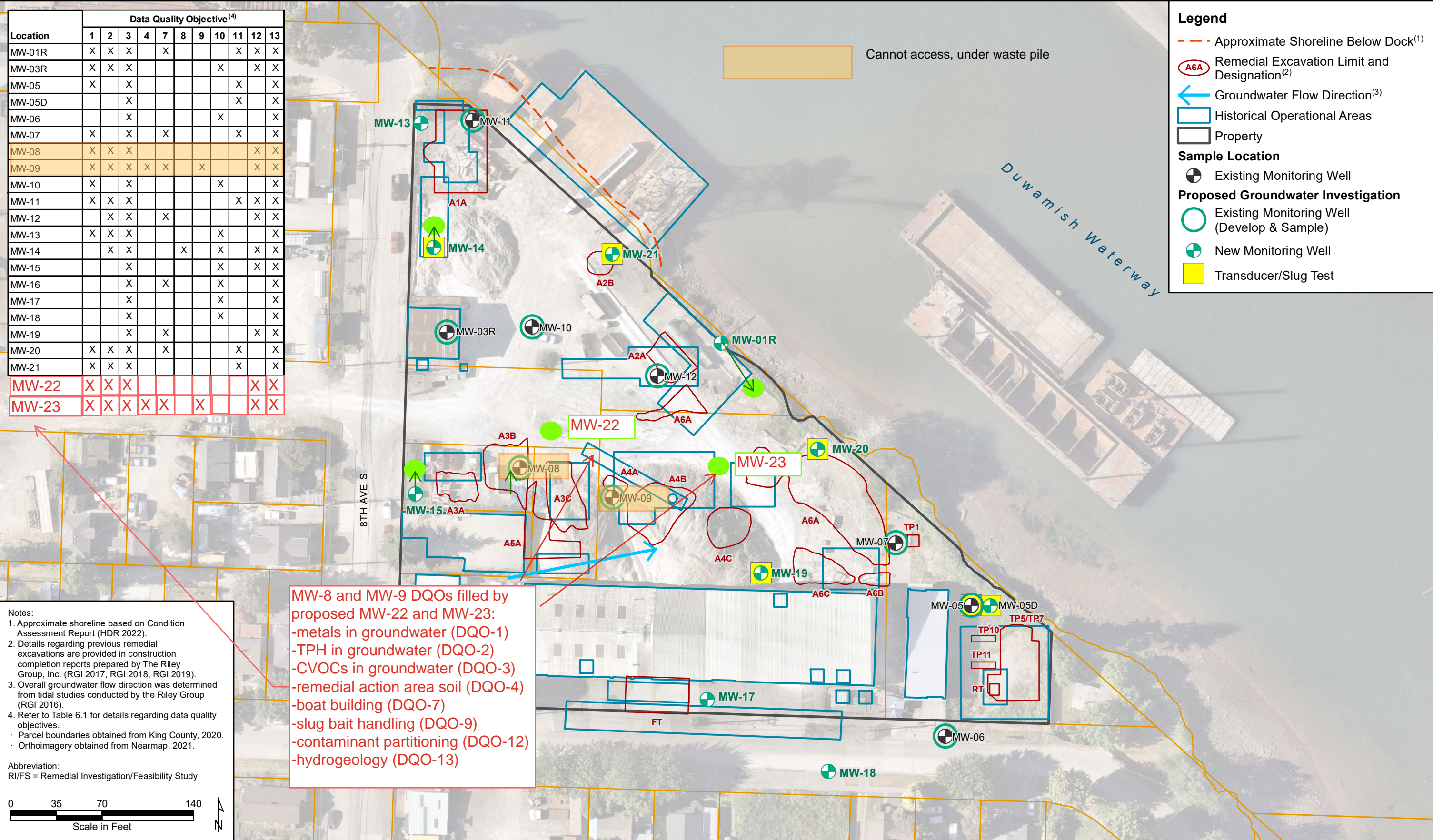
0 35 70 140  
 Scale in Feet

**Legend**

- - - Approximate Shoreline Below Dock<sup>(1)</sup>
- A6A Remedial Excavation Limit and Designation<sup>(2)</sup>
- ← Groundwater Flow Direction<sup>(3)</sup>
- Historical Operational Areas
- Property

**Sample Location**

- Existing Monitoring Well
- Proposed Groundwater Investigation
- Existing Monitoring Well (Develop & Sample)
- New Monitoring Well
- Transducer/Slug Test



Cannot access, under waste pile

H:\GIS\Projects\HDR-SPU-WQFMXD\RI\FS Work Plan\Figure 6.9 Proposed Groundwater Investigation.mxd  
 2/27/2023

Location	Data Quality Objective <sup>(3)</sup>												
	3	4	5	6	7	8	9	12					
FS-01			X										
FS-02			X										
FS-03			X										
FS-04/MW-13				X									
FS-05			X	X		X							
FS-06			X										
FS-07			X										
FS-08/MW-14						X		X					
FS-09							X						
FS-10			X										
FS-11/MW-21			X	X									
FS-12				X		X							
FS-13					X		X						
FS-14			X										
FS-15/MW-15				X				X					
FS-16/MW-16				X	X			X					
FS-17					X			X					
FS-18				X	X								
FS-19/MW-19					X			X					
FS-20/MW-20				X									
FS-21				X	X								
FS-22				X									
FS-23				X	X								
FS-24					X								
FS-25					X								
FS-26				X									
FS-27				X									
FS-28		X	X					X					
FS-29		X	X					X					
FS-30C													
FS-31C													
FS-32/MW-01R				X				X					
FS-33/MW-05D	X			X									
FS-34/MW-17	X												
FS-35/MW-18	X												
FS-36									X				

FS-17 DQOs to be filled: boat building (DQO-7) in vicinity of current building by FS-16, FS-18, FS-19, FS-21 slug bait handling (DQO-9) by FS-15, FS-16, FS-29, FS-36

FS-01 and FS-26 completed 9/2024 (during daytime low tide).

Proposed additional well installation (MW-22)

Proposed additional well installation (MW-23)

FS-29 to be installed and sampled immediately; add fill soil analyses to fill DQO-6 as proposed for FS-28

MW-05D, MW-18 and FS-22 borings completed in 2023

**Legend**

- - - Approximate Shoreline Below Dock<sup>(1)</sup>
- (A6A) Remedial Excavation Limit and Designation<sup>(2)</sup>
- Historical Operational Areas
- Property

**Previous Sample Location**

- Monitoring Well
- Direct Push Soil Boring
- Hand Auger Soil Boring
- Test Pit

**Proposed Soil Investigation**

- Proposed Soil Boring
- Contingent Soil Boring

**Notes:**

1. Approximate shoreline based on Condition Assessment Report (HDR 2022).
2. Details regarding previous remedial excavations are provided in construction completion reports prepared by The Riley Group, Inc. (RGI 2017, RGI 2018, RGI 2019).
3. Refer to Table 6.1 for details regarding data quality objectives.

· Parcel boundaries obtained from King County, 2020.  
· Orthoimagery obtained from Nearmap, 2021.

**Abbreviation:**  
RI/FS = Remedial Investigation/Feasibility Study

Scale in Feet

I:\GIS\Projects\HDR-SPU-WQFMXD\RI/FS Work Plan\Figure 6.10 Proposed Soil Investigation.mxd  
4/18/2023

**Table C.2**  
**Water Sample Locations and Data Quality Objectives**

Location	Metals in Groundwater (DQO #1)	Petroleum in Groundwater (DQO #2)	CVOCs in Groundwater (DQO #3)	Remedial Action Area Soil (DQO #4)	Boat Building (DQO #7)	Treated Wood Storage Area (DQO #8)	Slug Bait Handling (DQO #9)	Upgradient Groundwater (DQO #10)	Groundwater Discharge to Surface Water (DQO #11)	Contaminant Partitioning (DQO #12)	Hydrogeology (DQO #13)
MW-01R	x	x	x		x				x	x	x
MW-03R	x	x	x					x		x	x
MW-05	x		x						x		x
MW-05D			x						x		x
MW-06			x					x			x
MW-07	x		x		x				x		x
MW-22	x	x	x		x					x	x
MW-23	x	x	x	x	x		x			x	x
MW-10	x		x					x			x
MW-11	x	x	x						x	x	x
MW-12		x	x		x					x	x
MW-13	x	x	x					x			x
MW-14		x	x			x		x		x	x
MW-15			x					x			x
MW-16			x					x			x
MW-17			x					x			x
MW-18			x					x			x
MW-19			x		x					x	x
MW-20	x	x	x		x				x		x
MW-21	x	x	x						x		x

Abbreviations:

CVOC Chlorinated volatile organic compound

DQO Data quality objective



**Table C.3  
Water Sample Locations and Analytical Parameters**

Location	Well Screen Interval (feet bgs)	Metals	TPHD	TPHG	PCBs <sup>(1)</sup>	PAHs <sup>(5)</sup>	SVOCs <sup>(5)</sup>	D/F	TBT	VOC	TOC	Carbaryl/ Acetaldehyde	EPH	VPH
MW-01R	2–12	X	X <sup>(2)</sup>	X	X	--	X	X	X <sup>(3)</sup>	X	X	X <sup>(4)</sup>	X <sup>(2)</sup>	X <sup>(2)</sup>
MW-03R	5–20	X	X <sup>(2)</sup>	X	X	--	X	X	--	X	--	--	X <sup>(2)</sup>	X <sup>(2)</sup>
MW-05	7–12	X	X	X	X	--	X	X	X <sup>(4)</sup>	X	--	X <sup>(4)</sup>	--	--
MW-05D	20–30	X	X	X	X	--	X	X	X <sup>(4)</sup>	X	--	X <sup>(4)</sup>	--	--
MW-06	5–15	X	X	X	X	--	X	X	--	X	--	--	--	--
MW-07	6–20	X	X	X	X	--	X	X	X <sup>(3)</sup>	X	--	X <sup>(4)</sup>	--	--
MW-22	5–20	X	X <sup>(2)</sup>	X	X	X	--	--	--	X (CVOC)	--	--	X <sup>(2)</sup>	X <sup>(2)</sup>
MW-23	7–17	X	X <sup>(2)</sup>	X	X	X	--	--	X <sup>(3)</sup>	X (CVOC)	--	X	X <sup>(2)</sup>	X <sup>(2)</sup>
MW-10	7–18	X	X	X	X	--	X	X	--	X	--	--	--	--
MW-11	5–20	X	X <sup>(2)</sup>	X	X	--	X	X	X <sup>(4)</sup>	X	--	X <sup>(4)</sup>	X <sup>(2)</sup>	X <sup>(2)</sup>
MW-12	5–20	X	X <sup>(2)</sup>	X	X	X	--	--	X <sup>(3)</sup>	X (CVOC)	--	--	X <sup>(2)</sup>	X <sup>(2)</sup>
MW-13	4–14	X	X	X	X	--	X	X	--	X	--	--	--	--
MW-14	3–12	X	X <sup>(2)</sup>	X	X	--	X	X	--	X	X	--	--	--
MW-15	2–11	X	X	X	X	--	X	X	--	X	--	--	--	--
MW-16	3–12	X	X	X	X	--	X	X	X <sup>(3)</sup>	X	--	--	--	--
MW-17	5–14	X	X	X	X	--	X	X	--	X	--	--	--	--
MW-18	6–14	X	X	X	X	--	X	X	--	X	--	--	--	--
MW-19	5–14	X	X <sup>(2)</sup>	X	X	X	--	X	X <sup>(3)</sup>	X (CVOC)	X	--	--	--
MW-20	4–14	X	X	X	X	X	X	X	X <sup>(3)</sup>	X (CVOC)	--	X <sup>(4)</sup>	--	--
MW-21	3–13	X	X	X	X	--	X	X	X <sup>(4)</sup>	X (CVOC)	--	X <sup>(4)</sup>	--	--

Notes:

- 1 Initial PCB Aroclor analysis will be performed. Additional PCB congener analysis will be performed if PCB Aroclor results are non-detect.
- 2 Analyze TPHD with acid/silica gel clean-ups and EPH/VPH only if TPH is detected.
- 3 Analyze if detected in soil.
- 4 Analyze during subsequent monitoring rounds if detected in upgradient groundwater results during initial groundwater monitoring.
- 5 PAHs are a subset of the list of SVOCs. See Table C.7 for PAH and SVOC analyte lists.

Abbreviations:

- |      |                                       |      |                                       |
|------|---------------------------------------|------|---------------------------------------|
| bgs  | Below ground surface                  | TBT  | Tributyltin                           |
| CVOC | Chlorinated volatile organic compound | TOC  | Total organic carbon                  |
| D/F  | Dioxins/furans                        | TPH  | Total petroleum hydrocarbons          |
| EPH  | Extractable petroleum hydrocarbons    | TPHD | Total petroleum hydrocarbons-diesel   |
| PAH  | Polycyclic aromatic hydrocarbon       | TPHG | Total petroleum hydrocarbons-gasoline |
| PCB  | Polychlorinated biphenyl              | VPH  | Volatile petroleum hydrocarbons       |
| PCP  | Pentachlorophenol                     | VOC  | Volatile organic compound             |
| SVOC | Semi-volatile organic compound        |      |                                       |

**Table C.4**  
**Soil Sample Locations and Data Quality Objectives**

Location	CVOCs in Groundwater (DQO #3)	Remedial Action Area Soil (DQO #4)	Bank Fill Soil (DQO #5)	Fill Soil (DQO #6)	Boat Building (DQO #7)	Treated Wood Storage Area (DQO #8)	Slug Bait Handling (DQO #9)	Contaminant Partitioning (DQO #12)
FS-01			X					
FS-02			X					
FS-03			X					
FS-04/MW-13				X				
FS-05			X	X		X		
FS-06			X					
FS-07			X					
FS-08/MW-14						X		X
FS-09						X		
FS-10			X					
FS-11/MW-21			X	X				
FS-12				X		X		
FS-13C						X		
FS-14				X				
FS-15/MW-15				X			X	
FS-16/MW-16				X	X		X	
FS-17					X		X	
FS-18				X	X			
FS-19/MW-19					X			X
FS-20/MW-20				X				
FS-21				X	X			
FS-22				X				
FS-23				X	X			
FS-24					X			
FS-25					X			
FS-26			X					
FS-27			X					
FS-28		X		X			X	
FS-29C		X		X			X	
FS-30C					X			
FS-31C					X			
FS-32/MW-01R				X				X
FS-33/MW-05D	X			X				
FS-34/MW-17	X							
FS-35/MW-18	X							
FS-36							X	

Abbreviations:

CVOC Chlorinated volatile organic compound  
DQO Data quality objective


 Inaccessible beneath waste pile

**Table C.5**  
**Soil Sample Locations and Analytical Parameters**

Location	Intervals <sup>(1)</sup>	Archive <sup>(2)</sup>	Metals	TPHD	PCBs <sup>(3)</sup>	PAHs <sup>(11)</sup>	PCP	SVOCs <sup>(11)</sup>	D/F	TBT	VOCs	TPHG	pH	TOC	Acetaldehyde/ Carbaryl
FS-01	2-3	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	3-4	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	4-5	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	5-15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-02	2-3	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	3-4	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	4-5	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	5-15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-03	2-3	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	3-4	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	4-5	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	5-15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-04/MW-13	Fill	--	x	x	x	--	--	--	x	--	x	x	--	--	--
	Native - 15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-05	2 - 3 <sup>(6)</sup>	--	x	--	--	--	--	--	--	--	--	--	x	--	--
	3 - 4 <sup>(6)</sup>	--	x	--	--	--	--	--	--	--	--	--	x	--	--
	4 - 5 <sup>(6)</sup>	--	x	--	--	--	--	--	--	--	--	--	x	--	--
	Fill <sup>(6)</sup>	--	--	x	x	--	x	x	x	--	x	x	--	--	--
	Native - Capillary fringe	--	x <sup>(7)</sup>	x	--	x	x	--	x <sup>(8)</sup>	--	x	x	--	--	--
	Capillary fringe (4-6)	--	x <sup>(7)</sup>	x	--	x	x	--	x <sup>(8)</sup>	--	x	x	--	--	--
Water table - 15	x	--	--	--	--	--	--	--	--	--	--	--	--	--	
FS-06	2-3	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	3-4	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	4-5	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	5-15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-07	2-3	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	3-4	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	4-5	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	5-15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-08/MW-14	Fill	x	x <sup>(7)</sup>	x	--	x	x	--	x <sup>(8)</sup>	--	x	x	--	--	--
	Native - Capillary fringe	x	x <sup>(7)</sup>	x	x	x	x	--	x <sup>(8)</sup>	x	x	x	--	--	--
	Capillary fringe (4-6)	--	x <sup>(7)</sup>	x	x	x	x	x	x	x	x	x	--	x	--
	Water table-15	--	x <sup>(7)</sup>	x	x	x	x	x	x	x	x	x	--	x	--
FS-09	Fill	x	x <sup>(7)</sup>	x	--	x	x	--	x <sup>(8)</sup>	--	x	x	--	--	--
	Native - Capillary fringe	x	x <sup>(7)</sup>	x	--	x	x	--	x <sup>(8)</sup>	--	x	x	--	--	--
	Capillary fringe (4-6)	x	x <sup>(7)</sup>	x	--	x	x	--	x <sup>(8)</sup>	--	x	x	--	--	--
	Water table - 15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-10	2-3	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x	x	x	--	--
	3-4	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	4-5	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	5-15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-11/MW-21	2-3 <sup>(6)</sup>	--	x	--	--	--	--	--	--	--	--	--	x	--	--
	3-4 <sup>(6)</sup>	--	x	--	--	--	--	--	--	--	--	--	x	--	--
	4-5 <sup>(6)</sup>	--	x	--	--	--	--	--	--	--	--	--	x	--	--
	Fill <sup>(6)</sup>	--	--	x	x	--	--	x	x	--	x	x	--	--	--
Native - 15	x	--	--	--	--	--	--	--	--	--	--	--	--	--	
FS-12	Fill	--	x	x	x	--	x	x	x	--	x	x	--	--	--
	Native - Capillary fringe	x <sup>(8)</sup>	x <sup>(7)</sup>	x	--	x	x	--	--	--	x	x	--	--	--
	Capillary fringe (4-6)	x <sup>(8)</sup>	x <sup>(7)</sup>	x	--	x	x	--	--	--	x	x	--	--	--
	Water table - 15	x	--	--	--	--	--	--	--	--	--	--	--	--	--

**Table C.5**  
**Soil Sample Locations and Analytical Parameters**

Location	Intervals <sup>(1)</sup>	Archive <sup>(2)</sup>	Metals	TPHD	PCBs <sup>(3)</sup>	PAHs <sup>(11)</sup>	PCP	SVOCs <sup>(11)</sup>	D/F	TBT	VOCs	TPHG	pH	TOC	Acetaldehyde/ Carbaryl
FS-13C	Fill	x <sup>(8)</sup>	x <sup>(7)</sup>	x	--	x	x	--	--	--	x	x	--	--	--
	Native-15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-14	Fill	--	x	x	x	--	--	x	x	--	x	x	--	--	--
	Native - 15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-15/MW-15	Fill	--	x	x	x	--	--	x	x	--	x	x	--	--	x
	Native - 15	x	--	--	--	--	--	--	--	--	--	--	--	--	x
FS-16/MW-16	Fill	x <sup>(9)</sup>	x	x	x	--	--	x	x	x	x	x	--	--	--
	Native - Capillary fringe	x <sup>(9)</sup>	x	x	x	x	--	--	--	x	x	x	--	--	--
	Capillary fringe (4-6)	x <sup>(9)</sup>	x	x	x	x	--	--	--	x	x	x	--	--	--
	Water table - 15	x <sup>(9)</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-17	Fill	x <sup>(9)</sup>	x	x	x	x	--	--	--	x	x	x	--	--	--
	Native - Capillary fringe	x <sup>(9)</sup>	x	x	x	x	--	--	--	x	x	x	--	--	--
	Capillary fringe (4-6)	x <sup>(9)</sup>	x	x	x	x	--	--	--	x	x	x	--	--	--
	Water table - 15	x <sup>(9)</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-18	Fill	--	x	x	x	--	--	x	x	x	x	x	--	--	--
	Native - Capillary fringe	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Capillary fringe (5-7)	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Water table - 15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-19/MW-19	Fill	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Native- Capillary fringe	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Capillary fringe (6-8)	--	x	x	x	--	--	x	x	x	x	x	--	x	--
	Water table - 15	--	x	x	x	--	--	x	x	x	x	x	--	x	--
FS-20/MW-20	Fill	--	x	x	x	--	--	x	x	--	x	x	--	--	--
	Native -15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-21	Fill	--	x	x	x	--	--	x	x	x	x	x	--	--	--
	Native - Capillary fringe	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Capillary fringe (7 - 9)	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Water table - 15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-22	Fill	--	x	x	x	--	--	x	x	--	x	x	--	--	--
	Native to 15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-23	Fill	--	x	x	x	--	--	x	x	x	x	x	--	--	--
	Native to Capillary fringe	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Capillary fringe (5-7)	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Water table - 15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-24	Fill	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Native to Capillary fringe	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Capillary fringe (4-6)	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Water table - 15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-25	Fill	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Native - Capillary fringe	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Capillary fringe (3-5)	--	x	x	x	x	--	--	--	x	x	x	--	--	--
	Water table - 15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-26	2-3	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	3-4	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	4-5	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	5-15	x	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-27	2-3	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	3-4	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	4-5	--	x	x <sup>(4)</sup>	x <sup>(4)</sup>	--	--	x <sup>(4)</sup>	x <sup>(4)</sup>	--	x <sup>(5)</sup>	x <sup>(5)</sup>	x	--	--
	5-15	x	--	--	--	--	--	--	--	--	--	--	--	--	--

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**Table C.5  
Soil Sample Locations and Analytical Parameters**

Location	Intervals <sup>(1)</sup>	Archive <sup>(2)</sup>	Metals	TPHD	PCBs <sup>(3)</sup>	PAHs <sup>(11)</sup>	PCP	SVOCs <sup>(11)</sup>	D/F	TBT	VOCs	TPHG	pH	TOC	Acetaldehyde/ Carbaryl
FS-28	2-2.5/Fill	X <sup>(9)</sup>	X	X	X	--	X <sup>(10)</sup>	X	X	--	X	X	--	--	--
	2.5-7	X <sup>(9)</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--
	7-9	X <sup>(9)</sup>	X	X	X <sup>(10)</sup>	X <sup>(10)</sup>	X <sup>(10)</sup>	--	X <sup>(10)</sup>	--	X <sup>(5)</sup>	X <sup>(5)</sup>	--	--	--
	9-15	X <sup>(9)</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-29C	2-2.5 /Fill	X <sup>(9)</sup>	X	X	X <del>(10)</del>	X <del>(10)</del>	X <del>(10)</del>	--	X <del>(10)</del>	--	X <del>(5)</del>	X <del>(5)</del>	--	--	--
	2.5-7	X <sup>(9)</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--
	7-9	X <sup>(9)</sup>	X	X	X <sup>(10)</sup>	X <sup>(10)</sup>	X <sup>(10)</sup>	--	X <sup>(10)</sup>	--	X <sup>(5)</sup>	X <sup>(5)</sup>	--	--	--
	9-15	X <sup>(9)</sup>	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-30C	Fill	--	X	X	X	X	--	--	--	X	X	X	--	--	--
	Native - Capillary fringe	--	X	X	X	X	--	--	--	X	X	X	--	--	--
	Capillary fringe (5-7)	--	X	X	X	X	--	--	--	X	X	X	--	--	--
	Water table - 15	X	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-31C	Fill	--	X	X	X	X	--	--	--	X	X	X	--	--	--
	Native - Capillary fringe	--	X	X	X	X	--	--	--	X	X	X	--	--	--
	Capillary fringe (6-8)	--	X	X	X	X	--	--	--	X	X	X	--	--	--
	Water table - 15	X	--	--	--	--	--	--	--	--	--	--	--	--	--
FS-32/MW-01R	Fill	--	X	X	X	--	--	X	X	--	X	X	--	--	--
	Native - Capillary fringe	X	--	--	--	--	--	--	--	--	--	--	--	--	--
	Capillary fringe (3-5)	--	X	X	X	--	--	X	X	X	X	X	--	X	--
	Water table - 15	--	X	X	X	--	--	X	X	X	X	X	--	X	--
FS-33/MW-05D	Fill	--	X	X	X	--	--	X	X	--	X	X	--	--	--
	Native - Capillary fringe	X	--	--	--	--	--	--	--	--	--	--	--	--	--
	Capillary fringe (4-6)	X	--	--	--	--	--	--	--	--	x (CVOC)	--	--	--	--
	Water table - 30	X	--	--	--	--	--	--	--	--	x (CVOC)	--	--	--	--
FS-34/MW-17	Fill	--	--	--	--	--	--	--	--	--	x (CVOC)	--	--	--	--
	Native - Capillary fringe	--	--	--	--	--	--	--	--	--	x (CVOC)	--	--	--	--
	Capillary fringe (6-8)	--	--	--	--	--	--	--	--	--	x (CVOC)	--	--	--	--
	Water table - 15	--	--	--	--	--	--	--	--	--	x (CVOC)	--	--	--	--
FS-35/MW-18	Fill	--	--	--	--	--	--	--	--	--	x (CVOC)	--	--	--	--
	Native - Capillary fringe	--	--	--	--	--	--	--	--	--	x (CVOC)	--	--	--	--
	Capillary fringe (7-9)	--	--	--	--	--	--	--	--	--	x (CVOC)	--	--	--	--
	Water table - 15	--	--	--	--	--	--	--	--	--	x (CVOC)	--	--	--	--
FS-36	Fill	--	--	--	--	--	--	--	--	--	--	--	--	--	X
	Native - Capillary fringe	--	--	--	--	--	--	--	--	--	--	--	--	--	X
	Capillary fringe (4-6)	--	--	--	--	--	--	--	--	--	--	--	--	--	X
	Water table - 15	X	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

- Sample collection will begin below recent gravel surfacing and/or asphalt pavement. Assuming all intervals are in 'feet' and will be 2-feet or less in length when possible. Borings will be expanded deeper if needed to vertically delineate field indications of contamination. If a boring location has poor recovery, a second attempt will be advanced. See QAPP section 3.2.3 for further description of sample collection.
  - Assume archive sample intervals will be 2 feet or less when possible. If archive analyses are triggered, samples will be analyzed sequentially from shallower to deeper depths until results are less than PSLs.
  - Initial PCB Aroclor analysis will be performed. Additional PCB congener analysis will be performed if PCB Aroclor results are non-detect.
  - Five samples with highest metals results from the shoreline fill unit will be analyzed for this parameter. If any additional COIs exceed PSLs, the samples bounding the area of metals impacts will also be analyzed for those COIs.
  - Analysis will only be performed if PID field screen is greater than 10 times background. Additionally, the interval immediately below initial interval will be collected and analyzed.
  - Representative samples will be collected from each fill unit to characterize general fill quality, and will additionally be collected from the specified intervals to characterize the extent of the unit of metals-impacted shoreline fill.
  - Metals: As, Cr, Cu, Hg, Pb
  - Archive for dioxin/furan analysis if pentachlorophenol is detected.
  - Slug bait COIs will be analyzed if detected at a concentration exceeding the PSL at location FS-36 or FS-15.
  - Two samples with the highest metals results will be analyzed for this parameter.
  - PAHs are as subset of the list of SVOCs. See Table C.8 for PAH and SVOC analyte lists.
- Shading indicates volume required for analysis will be collected and archived.

Inaccessible beneath waste pile

Abbreviations:

- |  |  |                                     |  |
|--|--|-------------------------------------|--|
| As Arsenic                                 | D/F Dioxins/furans                     | PCB Polychlorinated biphenyl        | TBT Tributyltin                            |
| COI Contaminant of interest                | EPH Extractable petroleum hydrocarbons | PCP Pentachlorophenol               | TOC Total organic carbon                   |
| Cr Chromium                                | Hg Mercury                             | PID Photoionization detector        | TPHD Total petroleum hydrocarbons-diesel   |
| Cu Copper                                  | PAH Polycyclic aromatic hydrocarbon    | PSL Preliminary screening level     | TPHG Total petroleum hydrocarbons-gasoline |
| CVOC Chlorinated volatile organic compound | Pb Lead                                | SVOC Semi-volatile organic compound | VPH Volatile petroleum hydrocarbons        |
|  |  |                                     | VOC Volatile organic compound              |