SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

SITE INFORMATION:

Cleanup Site ID: 77

Duwamish Fill Site

Facility/Site ID: 2063

S 124th St & SR 99

Tukwila, King County, WA 98168

Section:	9	Latitude:	47.49621
Township:	23N	Longitude:	-122.29395
Range:	4E	Tax/Parcel ID:	n/a

Site scored/ranked for the Hazardous Sites List Publication: February 2018

SITE DESCRIPTION:

The Duwamish Fill Site site (Site) is a former Washington State Department of Transportation (WSDOT) street-waste landfill located in Tukwila, King County, Washington. The 8-acre property is located approximately 1,000 feet from the Duwamish River, and zoned for unspecified use within a larger area designated as a Manufacturing/Industrial Center (MIC) by the City of Tukwila (i.e., the property does not have a formal zoning designation within the MIC area). use.

The Site is bounded to the west by Tukwila International Boulevard (TIB; Highway 99), to the east by an on-ramp to northbound Highway 599, and to the north by an on-ramp to southbound Highway 599. TIB and the northbound Highway 599 on-ramp intersect near the southern end of the Site.

Adjacent properties include a King County Transit facility (Metro South Base) and other warehouse and commercial properties to the east; vacant land, residences to the west beyond a vegetated area; the Highway 599 and TIB interchange to the north, and office and commercial properties to the south.

The Site is currently operated as median area by Washington State Department of Transportation.

The Site is currently unused and has not been used by WSDOT since approximately 1992. The Site was previously used by WSDOT as a landfill for street cleaning waste beginning in the late 1960s to early 1970s and continuing through the early 1990s. The WSDOT street waste primarily included street sweepings and sludge from regular street maintenance, and were typically placed in stockpiles and subsequently spread out over the ground surface. Ecology's records indicate that the street wastes are up to 15 feet in thickness at the Site. Fill material was also placed at the Site in the middle 1960s during construction of Highway 599 and associated access ramps. Prior to 1965, the Site was primarily used as farmland.

The Site is currently undeveloped and mostly covered with vegetation, including trees and brush. A steep slope separates the southern portion of the Site (approximately 3 acres) from the northern portion of the Site (approximately 5 acres). The southern area of the Site is approximately 40 feet higher in elevation. The northern portion of the Site includes an area designated as a Category III/IV Wetland by the City of Tukwila.

SITE BACKGROUND:

A summary of prior operations/tenants at the subject property is presented below.

From	To	Operator/Tenant	Activity
1930	1950		Farmland (North/lower area); undeveloped (South/upper area)
1950	1965		Farmland (North/lower area); residences and portion of service station site (South/upper area)
1965	1966	WSDOT	Construction of Highway 599 and associated ramps

1966	1992	WSDOT	Street waste fill placement, upper and lower areas
1992	2017	WSDOT	Vacant/Unused property

SITE CONTAMINATION:

In 1988 the Duwamish Fill Site site was reported to Washington State Department of Ecology (Ecology) and placed on the Confirmed and Suspected Contaminated Sites List (CSCSL).

Historical Site investigation activities (performed between 1987 and 1992) have included characterization sampling of the WSDOT waste materials dumped at the Site (street sweepings and vactor truck sludge) and sampling and laboratory analysis of environmental media at the Site (surface soil/sediment, subsurface soil, surface water, and groundwater). No sampling has been reported for the Site since 1992.

In 1988, WSDOT collected 34 samples of street cleaning waste materials (street sweepings and vactor sludge) for analysis of leachable metals (using EP TOX methodology) and oil/grease. At least 12 of the samples were collected from "landfill" materials already placed at the Site (although the exact locations were not specified), and all were presented by WSDOT as being representative of the materials being placed at the Site. Leachable metals detected in the 34 WSDOT waste samples included barium, cadmium, copper, nickel, lead, selenium, and zinc. The leachable lead concentration in six samples [(5.38 to 22.01 milligrams per liter (mg/l)], including three of the "landfill" samples (5.38 to 20.73 mg/l), was above the dangerous waste criterion of 5 mg/l. Oil and grease were also detected at in the WSDOT waste samples at concentrations of 1.4 to 417.6 milligrams per kilogram (mg/kg).

In July, 1989, Ecology collected five surface soil samples at the Site including four samples (S1, S2, S5, and S6) collected from WSDOT waste materials placed in the upper area, and one (S3) from a bare patch in the lower area. Total metals detected in the five samples included arsenic, cadmium, chromium, copper, mercury, nickel, lead, selenium, and zinc. The total lead concentrations in samples S1, S2, and S6 (292 to 728 mg/kg) were above the Model Toxics Control Act (MTCA) Method A soil Cleanup Level (CUL) of 250 mg/kg. Four of the samples (excluding S6) were also analyzed for VOCs, PAHs, SVOCs, and pesticides/PCBs. Total cPAHs (summed using TEF methodology) were detected in all four samples at concentrations of 127 to 254 micrograms per kilogram (µg/kg), above the MTCA Method A soil CUL of 100 µg/kg. Other analytes detected at concentrations below MTCA Method A/B soil cleanup levels included PCB Aroclor 1254, non-carcinogenic PAHs, phthalates, and pentachlorophenol (PCP).

Surface soil samples were also collected by the City of Tukwila (February 1991) and Seattle/King County Department of Public Health (SKCDPH; April 1991); however, the information available in Ecology's records is insufficient regarding sample locations and sample collection methodologies. Consequently, the data from these samples cannot be considered as representative of Site conditions, and was not used for SHA ranking purposes. For informational purposes, analytes detected at concentrations above MTCA Method A soil CULs included total cadmium (3.2 mg/kg) , total mercury (20 mg/kg), total lead (up to 624 mg/kg), and total cPAHs (up to 674 ug/kg).

Subsurface soil samples were collected in 1988 and 1991 from soil borings advanced at the Site by Hart-Crowser as part of an investigation performed by WSDOT. In 1988, subsurface soil samples were collected from ten soil borings advanced at the Site and analyzed for leachable metals (using EP-TOX methodology). Leachable lead (up to 1.2 mg/l) and zinc (up to 2.2 mg/l) were detected at concentrations below dangerous waste criteria. Two samples from one boring (C-3A) were analyzed for VOCs based on an observed "solvent-like" odor with acetone (86 µg/kg), methylene chloride (2 µg/kg), toluene (5 µg/kg), 2-butanone (methyl ethyl ketone; 9 µg/kg), and total xylenes (3 µg/kg) detected at concentrations below MTCA Method A/B soil CUL.

In 1991, subsurface soil samples were collected from nine additional soil borings and analyzed for VOCs, SVOCs, TPH (using Method 418.1), PAHs, and metals. The total cPAH concentration (341 ug/kg) detected in one sample (B-17; 2.5 to 4 feet) was above the MTCA Method A soil CUL. Metals including arsenic, cadmium, chromium, copper, lead, nickel, and zinc were detected at concentrations below their respective MTCA Method A/B soil CULs. TPH was detected in 10 soil samples at concentrations up to 150 mg/kg, below the MTCA Method A soil CUL of 2,000 mg/kg. Detected VOCs and SVOCs included acetone (up to 2.1 mg/kg),

methylene chloride (up to 1.1 mg/kg), and di-n-butylphthalate (up to 1.4 mg/kg), but these compounds were also present in the laboratory method blank.

Surface water samples were collected in the lower Site area by Ecology in January 1990 and May 1990. Four surface water samples were collected during each sampling event (the locations differed for each event) and analyzed for VOCs, SVOCs, pesticides/PCBs, and oil/grease (May 1990 only). VOCs, SVOCs, pesticides, and PCBs were not detected in surface water samples from either sampling event. Oil/grease was detected in all four of the May 1990 samples at concentrations of 8.1 to 29.6 mg/l, but does not appear to be related to petroleum hydrocarbons based on field notes (no petroleum odor/sheen noted) and samples were described as murky, turbid, and containing organic matter and/or decayed vegetation. The surface water samples were not analyzed for metals--Ecology's records indicate that the January 1990 samples were not analyzed for metals because they were not preserved, but do not indicated why the May 1990 samples did not include metals analysis.

Two surface water samples were also collected by WSDOT in February 1990; however, Ecology's records do not include sufficient documentation of sample locations and sample collection and handling methodologies. Consequently, the data from these samples cannot be considered as representative of Site conditions, and was not used for SHA ranking purposes. For informational purposes, analytes detected in the WSDOT surface water samples included copper (11 µg/l), nickel (10 µg/l), zinc (12 µg/l), PCP (4 µg/l), total organic halides (TOX; 30 µg/l), and 2-methylnaphthalene (2 µg/l).

Four groundwater monitoring wells were installed at the Site in 1991, and samples were collected by Hart Crowser in July 1991 and February 1992. In addition, Ecology independently collected groundwater samples from the Site wells in July 1991. Groundwater samples collected by Hart-Crower in July 1991 and February 1992 were analyzed for total and dissolved metals, TPH, VOCs, SVOCs, and PAHs. Total metals detected at concentrations above MTCA Method A groundwater CULs included arsenic (up to 37 µg/l), cadmium (up to 10 µg/l), chromium (up to 130 µg/l), and lead (up to 200 µg/l). Total copper, nickel, and zinc were also detected at concentrations above laboratory reporting limits. Dissolved metals detected at concentrations above MTCA Method A groundwater cleanup levels included only arsenic (up to 9 µg/l). Dissolved lead, copper, and zinc were also detected at concentrations above laboratory reporting limits. TPH (by Method 418.1) was not detected in any of the groundwater samples, but the reporting limit of 1,000 µg/l is above the MTCA Method A groundwater CUL of 500 µg/l (for diesel- and/or oil-range TPH). No cPAH analytes were detected in the groundwater samples, but the reporting limit of 0.1 ug/l equals the MTCA Method A groundwater cleanup level. Other compounds detected in groundwater samples collected by Hart-Crowser included tetrachloroethylene (PCE, 5 ug/l), bis(2-ethylhexyl)phthalate (16 ug/l), phenanthrene (0.092 ug/l), acetone (21 ug/l), methylene chloride (3 ug/l), and toluene (1 ug/l). The PCE concentration (detected only at MW-3) equals the MTCA Method A groundwater CUL.

Groundwater samples collected by Ecology in July 1991 were analyzed for total and dissolved metals, HCID (hydrocarbon ID), VOCs, PAHs, pesticides/PCBs, and ethylene glycol. Total metals detected in the Ecology groundwater samples included arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc, with the total arsenic concentration (up to 6.19 µg/l) above the MTCA Method A groundwater CUL. Dissolved metals detected at concentrations above laboratory reporting limits included arsenic, lead, mercury, and zinc. PAHs were detected at MW-4, with a total cPAH concentration of 0.037 ug/l, above the MTCA Method B groundwater CUL of 0.012 ug/l but below the MTCA Method A CUL of 0.1 ug/l. Pesticides were not detected at concentrations above the laboratory reporting limit except for heptachlor in sample MW-2 at a concentration of 0.29 µg/l, above the MTCA Method B groundwater CUL of 0.0194 µg/l. VOCs were not detected at concentrations above the laboratory reporting limit except for acetone in sample MW-4 at a concentration of 21 µg/l. Hydrocarbons and ethylene glycol were not detected at concentrations above the laboratory reporting limits.

REMEDIATION ACTIVITIES:

No remedial activities have been performed at the Site. The Site has been vacant since the early 1990s when placement of street-waste materials by WSDOT ended.

CURRENT SITE CONDITIONS:

SITE HAZARD ASSESSMENT
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Previous Site reports and documents included in Ecology's records indicate a surface water drainage system at the Site discharges surface water to a drainage ditch located east of the Highway 599 ramp (through a culvert located beneath the on-ramp along the eastern Site margin). The drainage ditch subsequently discharges to a stream and ultimately to the LDW, although the exact route is not confirmed, and the current condition of surface water facilities and run-on/run-off routes are unverified. The most likely surface water runoff route appears to be via Riverton Creek, a Class II stream located east of the Site which discharges to the LDW.

As previously discussed, a wetland area has been described in the lower Site area. The City of Tukwila classifies most of the wetland area in the lower Site area as a Class III wetland, but a small area near the eastern Site margin is classified as a Class IV wetland. The current margins and conditions, including seasonal variations, of Site wetland areas are unconfirmed.

Adjacent Ecology sites include the KC Metro facility located east (presumably down-gradient) from the Site. The KC Metro site is listed by Ecology as a LUST site with petroleum hydrocarbons and benzene in soil and groundwater. The release area is located near the western margin of the KC Metro facility, and is separated from the Duwamish Fill Site by the Highway 599 on-ramp.

The approximate depth to groundwater is 2-20 feet below ground surface, with groundwater flowing to the northeast. Subsurface soils are mixed fill (sand, silt, gravel mixture) and native sand and silt.

SPECIAL CONSIDERATIONS:

Checked boxes indicate routes applicable for Washington Ranking Method (WARM) scoring

☑ **Surface Water**

☐ **Air**

VOCs not identified as primary Site COCs; no buildings are present on the Site.

☑ **Groundwater**

Prior detection of COCs in groundwater.

Data for some of the characterization samples collected in the 1980s and 1990s are of limited use based on unknown or unverified sample locations and/or lack of documentation regarding sampling methods, including two surface water samples collected by WSDOT in 1990, three surface soil samples collected by the City of Tukwila in 1991, and three surface soil samples collected by SKCDPH in 1991. Consequently, the results for these samples are not necessarily representative of past Site conditions or suitable for evaluation of current condtions, and have therefore not been considered for SHA ranking purposes. The Site is scored for lead and cPAHs, as they were detected in multiple matrices (street waste samples and onsite media) and are the best overall indicators at the Site. Addition of other COCs that have been previously detected at the Site at concentrations above MTCA Method A CULs (e.g. cadmium, chromium, heptachlor, arsenic, and TPH) would not change the Site's score. Additional characterization of current conditions at the Site is needed.

ROUTE SCORES:

Surface Water/ Human Health:	35.8	Surface Water/ Environment:	55.9
Air/ Human Health:		Air/ Environment:	
Groundwater/ Human Health:	67.1		

Overall Rank: 1

REFERENCES:

SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

1 Ecology and Environment. 1990. Duwamish Fill Site Remedial Investigation Work Plan. Prepared for Ecology. Dated October 1990.

2 Ecology Water Resources Explorer, accessed June 2017. https://fortress.wa.gov/ecy/waterresources/map/WaterResourcesExplorer.aspx

3 Hart-Crowser. 1989. Phase I Sampling and Analysis, WSDOT Solid Waste Disposal Site. Prepared for WSDOT. Dated April 1989.

4 Hart-Crowser. 1991. Environmental Assessment of Soil and Groundwater Quality, Duwamish Fill Site. Prepared for WSDOT. Dated 26 August 1991.

5 Hart-Crowser. 1992. Results of Wet-Season Groundwater Sampling, Duwamish Fill Site. Prepared for WSDOT. Dated 27 March 1992.

6 Kennedy/Jenks Consultants. 2017. Draft Technical Memorandum, Duwamish Fill Site, Site Status and Historical Review Summary. Prepared for Washington State Department of Ecology. Dated 17 May 2017.

7 King County GIS Center iMAP application, Property Information, Groundwater Program, and Sensitive Areas mapsets. Accessed June 2017. http://www.kingcounty.gov/operations/GIS/Maps/iMAP.aspx

8 King County Metro Transit. 1990. Memo, Trace Organics Results for Duwamish/Elliott Bay Wetlands Samples, for Surface Water Samples Collected 30 January 1990. Metro Laboratory. Dated 1 March 1990 (mislabeled 1 March 1989 on some copies).

9 National Climatic Data Center 2011 Local Climatological Data for Seattle, Seattle Tacoma Airport. http://www1.ncdc.noaa.gov/pub/orders/IPS-90B1F39F-6CFA-4A6B-AA82-5ED1FF897CCC.pdf

10 Seattle-King County Department of Public Health. 1991. Letter to Washington State Department of Transportation, RE: DOT Dump Site in Tukwila, WA, for Surface Soil Samples Collected 16 April 1991. Seattle-King County Department of Public Health. Dated 23 April 1991.

11 Tukwila, City of. 1991. Letter to Seattle-King County Department of Public Health, for Surface Soil Samples Collected 8 February 1991. City of Tukwila. Dated 15 March 1991.

12 U.S. Environmental Protection Agency. 1990. Report of Investigation, Control Number 90-10-10-9. United States Environmental Protection Agency Office of Criminal Investigations. Dated 8 January 1990.

13 WARM Scoring Manual

14 WARM Toxicological Database

15 Washington Department of Transportation 24-hour Isopluvial Maps, January 2006 update. http://www.wsdot.wa.gov/publications/fulltext/Hydraulics/Wa24hrIspoluvials.pdf

16 Washington State Department of Ecology. 1989. Field Sampling Report, DOT Wetland, for Surface Soil/Sediment Samples Collected 24 July 1989. Dated 24 July 1989.

17 Washington State Department of Ecology. 1990a. Sampling Report and Protocol, Duwamish Fill Site, for Surface Water Samples Collected 30 January 1990. Dated 30 January 1990.

18 Washington State Department of Ecology. 1990c. Sampling Report and Protocol, Duwamish Fill Site, for Surface Water Samples Collected 8 May 1990. Dated 2 October 1990.

SITE HAZARD ASSESSMENT
Worksheet 2
Route Documentation

Cleanup Site ID: 77 Duwamish Fill Site

Facility/Site ID: 2063

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

Lead and cPAHs (as benzo(a)pyrene)

Explain the basis for choice of substances to be used in scoring:

Detected in soil and groundwater above MTCA cleanup levels.

List those management units to be considered for scoring:

Surface Water

Explain basis for choice of unit to be used in scoring:

Potential for transport of contaminants in soil and groundwater to surface water.

2. AIR ROUTE

List those substances to be considered for scoring:

n/a

Explain the basis for choice of substances to be used in scoring:

n/a

List those management units to be considered for scoring:

n/a

Explain basis for choice of unit to be used in scoring:

n/a

3. GROUNDWATER ROUTE

List those substances to be considered for scoring:

Lead and cPAHs (as benzo(a)pyrene)

Explain the basis for choice of substances to be used in scoring:

Detected in soil and groundwater above MTCA cleanup levels.

List those management units to be considered for scoring:

Groundwater

Explain basis for choice of unit to be used in scoring:

Contaminants in groundwater above MTCA cleanup levels; potential for leaching of soil contaminants to groundwater.

Worksheet 4

Surface Water Route

CSID: 77 **Site Name:** Duwamish Fill Site

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Lead	6	10	X	X
Benzo(a)pyrene	10	10	X	7

Highest Value 10

Bonus Points? 2

Human Health Toxicity Value 12

1.2 Environmental Toxicity

Substance	Acute Water Quality Criteria		Non-human Mammalian Acute Toxicity	
	ug/L	Value	mg/kg	Value
Lead	65	6	<0.001	10
Benzo(a)pyrene	--	X	50	10

Environmental Toxicity Value 6

1.3 Substance Quantity

Amount: >1.9 - 10 acres

Basis: Aerial extent of potentially affected surface soil

Substance Quantity Value 9

2.0 Migration Potential

2.1 Containment Containment Value 10

Explain Basis: Unmaintained or unknown run-on/runoff controls

2.2 Surface Soil Permeability Soil Permeability Value 3

Sand silt mixture

2.3 Total Annual Precipitation Total Precipitation Value 3

37 inches

2.4 Max 2-yr/24-hour Precipitation 2YR/24HR Precipitation Value 3

2.4 inches

2.5 Floodplain Floodplain Value 0

Not in a floodplain

2.6 Terrain Slope Slope Value 3

<5% to 8%, culverted

Worksheet 4

Surface Water Route

CSID: 77 **Site Name:** Duwamish Fill Site

3.0 Targets

3.1 Distance to Surface Water — Surface Water Distance Value: 10

200 feet to stream/drainage ditch through culvert

3.2 Population Served within 2 miles — Population Value: 2

3 people

3.3 Area Irrigated within 2 miles — Irrigation Value: 4

27.5 acres

3.4 Distance to Nearest Fishery Resource — Fishery Value: 12

<1,000 feet to stream/drainage ditch

3.5 Distance to and Name of Nearest Sensitive Environment — Sensitive Environment Value: 12

<1,000 feet to stream/drainage ditch

4.0 Release — Release to Surface Water Value: 5

Explain basis for scoring a release to surface water

Wetland onsite, surface runoff over and infiltration through impacted soil; drains directly to steam/ditch

Pathway Scoring - Surface Water Route, Human Health Pathway

$SW_H = (SUB_{SH}*40/175)*[(MIG_S*25/24) + REL_S + (TAR_{SH}*30/115)]/24$

Where:

SUB_{SH} = (Human Toxicity Value + 3)*(Containment + 1) + Substance Quantity	SUB_{SH}	174
MIG_S = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope	MIG_S	12
REL_S = Release to Surface Water	REL_S	5
TAR_{SH} = Distance to Surface Water + Population Served by Surface Water + Area Irrigated	TAR_{SH}	15.7
	SW_H	35.8

Pathway Scoring -Surface Water Route, Environmental Pathway

$SW_E = (SUB_{SE}*40/153)*[(MIG_S*25/24) + REL_S + (TAR_{SE}*30/34)]/24$

Where:

SUB_{SE} = (Env Tox Value + 3) * (Containment + 1) + Substance Qty	SUB_{SE}	108
MIG_S = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope	MIG_S	12
REL_S = Release to Surface Water	REL_S	5
TAR_{SE} = Distance to Surface Water + Distance to Fishery + Distance to Sensitive Environment	TAR_{SE}	34.0
	SW_E	55.9

Worksheet 6

Groundwater Route

CSID: 77 **Site Name:** Duwamish Fill Site

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Lead	6	10	X	X
Benzo(a)pyrene	10	10	X	7

Highest Value 10

Bonus Points? 2

Toxicity Value 12

1.2 Mobility

Cations/Anions Max Value:

Solubility Max Value: 2 Mobility Value 2

1.3 Substance Quantity

Amount: >5,000 -50,000 cubic yards

Basis: Potential street cleaning waste fill volume

Substance Quantity Value 5

2.0 Migration Potential

2.1 Containment Containment Value 10

Explain Basis: Contaminated soil present

2.2 Net Precipitation 12 inches Net Precipitation Value 2

2.3 Subsurface Hydraulic Conductivity primarily silt and sand Conductivity Value 3

2.4 Vertical Depth to Groundwater less than 5 feet

Confirmed release: Yes Depth to Aquifer Value 8

3.0 Targets

3.1 Groundwater Usage Aquifer Use Value 4

Private supply but alternate sources available with minimum hookup requirements

3.2 Distance to Nearest Drinking Water Well 4,200 feet

Well Distance Value 2

3.3 Population Served within 2 Miles Population Served Value 100

10000 people

Worksheet 6

Groundwater Route

CSID: 77 **Site Name:** Duwamish Fill Site

3.4 Area Irrigated by GW Wells within 2 miles Area Irrigated Value 1

3 acres

4.0 Release Release to Groundwater Value 5

Explain basis for scoring a release to groundwater:

Analytical data for groundwater samples

Pathway Scoring - Groundwater Route, Human Health Pathway

$GW_H = (SUB_{GH}*40/208)*[(MIG_G*25/17)+REL_G+(TAR_{GH}*30/165)]/24$

Where:

SUB_{GH} =(Human toxicity + mobility + 3) * (Containment + 1) + Substance Qty	SUB_{GH}	192
MIG_G=Depth to Aquifer+Net Precip + Hydraulic Conductivity	MIG_G	13
REL_G = Release to Groundwater	REL_G	5
TAR_{GH} = Aquifer Use + Well Distance + Population Served + Area Irrigated	TAR_{GH}	107.3
	GW_H	67.1

Washington Ranking Method

Route Scores Summary and Ranking Calculation Sheet

Site Name: Duwamish Fill Site **CSID:** 77

Site Address: S 124th St & SR 99 **FSID:** 2063

HUMAN HEALTH ROUTE SCORES

Enter Human Health Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	35.8	5
Air	ns	0
Groundwater	67.1	5

H= 5
M= 5
L= 0

$$\frac{H^2 + 2M + L}{8} = \frac{25 + 10 + 0}{8}$$

Human Health Priority Bin Score: **5**

rounded up to next whole number

ENVIRONMENT ROUTE SCORES

Enter Environment Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	55.9	5
Air	ns	0

H= 5
L= 0

$$\frac{H^2 + 2L}{7} = \frac{25 + 0}{7}$$

Environment Priority Bin Score: **4**

rounded up to next whole number

Comments/Notes:

FINAL MATRIX RANKING **1**

FOR REFERENCE:

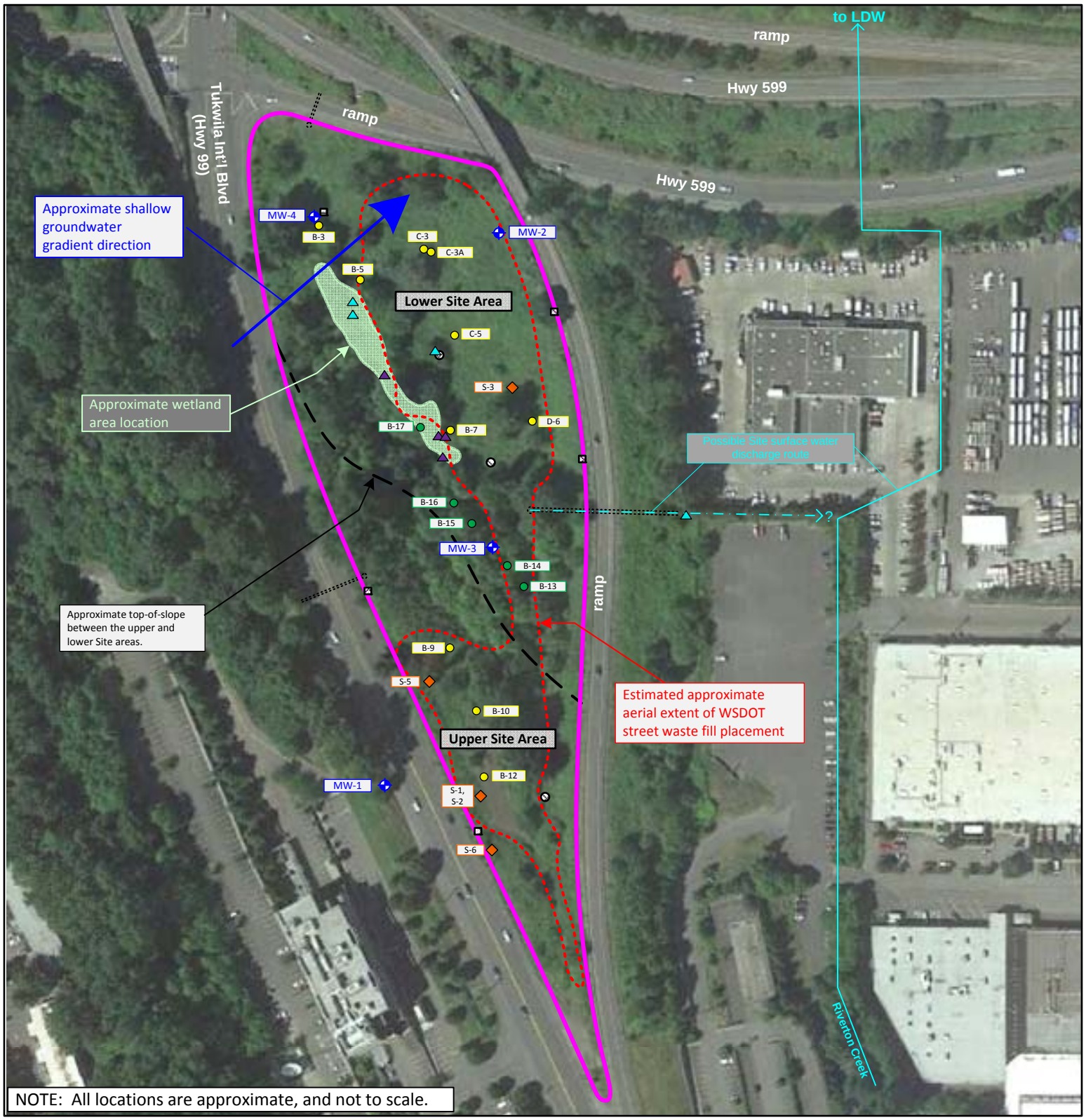
Final WARM Bin Ranking Matrix

Human Health Priority	Environment Priority 5	4	3	2	1	N/A
5	1	1	1	1	1	1
4	1	2	2	2	3	2
3	1	2	3	4	4	3
2	2	3	4	4	5	3
1	2	3	4	5	5	5
N/A	3	4	5	5	5	NFA

Quintile Values for Route Scores - August 2017 Values

Quintile	Human Health Surface Water	Human Health Air	Human Health Ground Water	Environment Surface Water	Environment Air
5	>= 29.8	>= 39.1	>= 50.3	>= 49.7	>= 27.8
4	>= 21.4	>= 25.0	>= 40.3	>= 32.1	>= 15.3
3	>= 15.5	>= 15.8	>= 33.1	>= 24.2	>= 1.6
2	>= 8.0	>= 8.4	>= 24.0	>= 11.6	>= 1.3
1	<= 7.9	<= 8.3	<= 23.9	<= 11.5	<= 1.2

Quintile value associated with each route score entered above



Legend:

- Property location
- Ecology Surface Soil Samples – July 1989 (Approximate)
- WSDOT Soil Borings – Nov/Dec 1988 (Approximate)
- WSDOT Soil Borings – June 1991 (Approximate)
- Ecology Surface Water Samples – January 1990 (Approximate)
- Ecology Surface Water Samples – May 1990 (Approximate)
- WSDOT Monitoring Wells – June 1991 (Approximate)

N

DRAFT

Duwamish Fill Site
S124th St & SR99
Tukwila, WA 98108

DEPARTMENT OF ECOLOGY
State of Washington

Site Overview Map

CSID 77
CSID77.vsd