SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

SITE INFORMATION:

Cleanup Site ID: 2622

Burlington Environmental LLC Georgetown

Facility/Site ID: 47779679

734 S Lucile St

Seattle, King County, WA 98108

Section:	20	Latitude:	47.55391
Township:	24N	Longitude:	-122.32290
Range:	4E	Tax/Parcel ID:	5084400124, 1722800206

Site scored/ranked for the Hazardous Sites List Publication: August 2015

SITE DESCRIPTION:

The Burlington Environmental LLC Georgetown site (Site) is a former Resource Conservation and Recovery Act (RCRA) hazardous waste treatment, storage, and disposal facility located in Seattle, King County, Washington. The 1.95-acre property is located approximately 4,200 feet from the Lower Duwamish Waterway (LDW), and zoned for industrial (IG1 U/85) use.

The Site is bordered on the south by South Lucile Street. Adjacent properties include a railyard owned by Union Pacific to the north and east, additional properties owned by Burlington Environmental to the west, and a trailer repair facility to the south.

The Site is currently operated as a vacant lot by Stericycle Environmental Solutions, Inc. (formerly Philip Environmental Inc.).

This Site is one of four subsites of the West of Fourth Site (Cleanup Site ID [CSID] 12260), listed for commingled groundwater plumes in the Georgetown area of Seattle. The three other subsites are Capital Industries Inc (CSID 4527/FSID 11598755, 5801 3rd Avenue South, tax parcels 1722801620 and 1722802255), Blaser Die Casting (CSID 1588/FSID 7118747, 5700 3rd Avenue South, tax parcel 1722801495), and Art Brass Plating Inc Seattle (CSID 3548/FSID 88531932, 5516 3rd Avenue South, tax parcel 5263300240). This Site (CSID 2622) is also known as the Philip Services Corporation (PSC) site. Separate remedial investigations were conducted at each subsite, however all four sites are now undergoing cleanup under one agreed order. Locations of all four sites are shown on the attached map for CSID 12260.

SITE BACKGROUND:

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

From	To	Operator/Tenant	Activity
1986		Chemical Processor Inc	After 1988, both tax parcels were owned by Chemical Processor Inc
	1986	Ronald S West	(tax parcel 1722800206)
	1988	Union Pacific Railroad Co	Railyard (tax parcel 5084400124)
	2015	Stericycle Environmental Solutions, Inc.; formerly Philip Environmental Inc	Philip Services Corp

SITE CONTAMINATION:

In 1988 the Burlington Environmental LLC Georgetown site was reported to Washington State Department of Ecology (Ecology) and placed on the Confirmed and Suspected Contaminated Sites (CSCSL) list with ID number 2622.

According to Ecology's records, 24 USTs formerly operated at the PSC site and were reportedly removed from the Site in 1987. PSC ceased operations at the Site in 2002.

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Several releases have been documented at the PSC site, however additional undocumented releases are expected to have occurred. From 1970 to 1979, leaks from the former storage tanks and piping are expected to have occurred. Surface spills from leaking drums, equipment, or from a furnace fire are expected to have released polychlorinated biphenyls (PCBs) from oil and other contaminants to surface soil at the site.

According to release reports from the Environmental Protection Agency's (EPA's) Toxics Release Inventory (TRI) database, chemicals listed for the facility between 1998 and 2002 included 1,2-dichloroethane, asbestos, benzene, butyl acrylate, carbon tetrachloride, cyanide compounds, dichloromethane, ethylene glycol, isopropyl alcohol, lead compounds, methyl ethyl ketone, methyl isobutyl ketone, mercury compounds, n-butyl alcohol, n-methyl-2-pyrrolidone, nitrate compounds, naphthalene, toluene, trichloroethylene, xylenes, and zinc compounds.

In 1993, a stormwater system was reportedly upgraded at the PSC site, making the stormwater system contained for the facility. The site was capped with concrete.

Reportedly, impacted soil in the region of the PSC site is confined to the property boundaries. Groundwater impacts, primarily from chlorinated solvents, are present at the site and extend offsite to the southwest, and a localized dense non-aqueous phase liquid (DNAPL) composed primarily of chlorinated solvents is present onsite and to the west of the facility.

PAST REMEDIATION ACTIVITIES:

In 2003 and 2004, as part of an interim remedial action, a subsurface barrier wall was installed around the boundary of the facility so that impacted groundwater was more likely to stay localized near the PSC site. A groundwater extraction system was installed inside the barrier wall, in order to create an inward gradient for groundwater. Ongoing groundwater monitoring is reportedly occurring at the PSC site.

An ongoing secondary remedial action includes individual assessments of buildings in the Georgetown area for vapor intrusion from the PSC groundwater plume. As of 2011, PSC had implemented mitigation measures at 33 properties.

In 2003, a remedial investigation report was completed for the PSC Georgetown facility. Trichloroethylene (TCE), tetrachloroethylene (PCE), and PCBs were detected in site soil at concentrations above the MTCA Method B cleanup levels. In groundwater, concentrations of PCE, TCE, benzene, toluene, ethylbenzene, xylenes, cis-1,2-dichloroethylene (cis-1,2-DCE), trans-1,2-dichloroethylene (trans-1,2-DCE), vinyl chloride, chloroform, methyl isobutyl ketone (MIBK), 1-hexanone, some phenols and light polycyclic aromatic hydrocarbons (PAHs), and 1,4-dioxane were detected at concentrations above the Model Toxics Control Act (MTCA) Method B cleanup levels.

In 2010, Ecology issued a final CAP for the closed PSC Georgetown facility. Following acceptance of the revised EDR, remedial actions were completed at the Site. PCB-containing soils were removed from the Site. PCB-containing soils are still present at the Site, but beneath a cap.

Several soil excavations have reportedly been conducted at the Site and on the adjacent Union Pacific Railroad (UPRR) property.

In 2012, 15 soil vapor extraction (SVE) wells were installed on the Site and adjacent UPRR Argo Yard property. The SVE system operated concurrently with a groundwater extraction system. LNAPL was discovered in piping from the three UPRR SVE wells in February 2013. The three wells were closed, though the SVE system remained in operation during this time. In late 2013 and early 2014, a catalytic oxidizer was installed at the Site to addres the discovery of LNAPL in the three wells. VOCs present in SVE wells primarily T, E, X, VC. Part of the SVE system was shut down in 2014.

CURRENT SITE CONDITIONS:

Limited groundwater results from two samples collected in 2011 indicated that TCE and vinyl chloride were still present in Site groundwater above the MTCA Method A cleanup levels, and 1,4-dioxane was present in groundwater above the MTCA Method B cleanup level. Cis-1,2-DCE was also detected above the MTCA Method B cleanup level in 2010, but not in 2011. Analytical results for other analytes identified in 2003 were not available for review.

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A Feasibility Study and Cleanup Action Plan have been completed for the portion of PSC-Georgetown (Burlington Environmental LLC) site that is east of Fourth Avenue South, which includes the Burlington Environmental LLC Georgetown site. An agreed order was issued in 2010. An engineering design report was submitted to and approved by Ecology. As of 2015, most of the actions in the report have been implemented.

The approximate depth to groundwater is less than 25 feet below ground surface, with groundwater flowing to the west or southwest (based on groundwater elevations and surface topography). Subsurface soils are expected to be sand and silt.

SPECIAL CONSIDERATIONS:

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

☑ **Surface Water**

Impacted groundwater in the region has been documented to discharge to surface water in the LDW.

☑ **Air**

Mitigation measures implemented at the Site and adjacent properties are expected to decrease the likelihood of vapor intrusion via the air route, however volatile organic compounds (VOCs) are still present in Site groundwater and soil.

☑ **Groundwater**

Impacted groundwater is present at the Site.

This Site is part of the larger West of Fourth site (CSID 12260) which includes multiple areas of groundwater affected by solvents, including potentially commingled plumes.

ROUTE SCORES:

Surface Water/ Human Health:	16.6	Surface Water/ Environment:	31.5
Air/ Human Health:	6.5	Air/ Environment:	1.3
Groundwater/ Human Health:	35.5		

Overall Rank: 4

REFERENCES:

1 Amec, 2012, Soil Vapor Extraction Startup Technical Memorandum. September 28.

2 Amec, 2013, PSC Area Implementation Report. Prepared for Burlington Environmental, LLC. January.

3 Amec, 2014, Catalytic Oxidizer Startup and Reconfigured Sytem Operations Summary. March 18.

4 Ecology and Environment, Inc., 2009, Lower Duwamish Waterway River Mile 1.2-1.7 East (Saint Gobain to Glacier Northwest) Summary of Existing Information and Identification of Data Gaps Final Report. February 2009.

5 Farallon Consulting, LLC., 2012, Revised Draft Remedial Investigation Report Capital Industries, Inc. 5801 3rd Avenue South Seattle, Washington Agreed Order No. DE 5348. Prepared for Capital Industries, Inc. October 2012.

6 Geomatrix, 2006, Draft Technical Memorandum No. 2: Remediation Areas. Prepared for Philip Services Corporation. June.

7 Gray, Natasya, 2013, Email Re: CATOX Start-Up at PSC Georgetown. November 1.

8 King County GIS Center iMAP application, Property Information, Groundwater Program, and Sensitive Areas mapsets. Accessed March 2014. http://www.kingcounty.gov/operations/GIS/Maps/iMAP.aspx

9 Missouri Census Data Center, Circular Area Profiles - 2010 census data around a point location. http://mcdc.missouri.edu/websas/caps10c.html. Accessed March 2014.

10 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

11 Pacific Groundwater Group, 2012, Blaser Die Casting Revised Remedial Investigation Report. August 2, 2012.

12 PSC, 2003, Final Comprehensive Remedial Investigation Report. November 14.

13 State of Washington Department of Ecology, 2014, Agreed Order No. DE 10402. January 7, 2014.

14 WARM Scoring Manual

15 WARM Toxicological Database

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

17 Washington State Department of Ecology, 2010, Fact Sheet: Dangerous Waste Corrective Action Permit, Agreed Order, and Cleanup Action Plan for Burlington Environmental, LLC. February.

SITE HAZARD ASSESSMENT
Worksheet 2
Route Documentation

Cleanup Site ID: 2622 Burlington Environmental LLC Georgetown

Facility/Site ID: 47779679

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

TCE, vinyl chloride, cis-1,2-DCE, 1,4-dioxane

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

Prior detection in Site groundwater

List those management units to be considered for scoring:

Surface water

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

Potential for impacted groundwater to discharge to the LDW

2. AIR ROUTE

List those substances to be considered for scoring:

TCE, vinyl chloride, cis-1,2-DCE, 1,4-dioxane

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

Prior detection in Site groundwater

List those management units to be considered for scoring:

Soil vapor

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

Potential for vapor transport

3. GROUNDWATER ROUTE

List those substances to be considered for scoring:

TCE, vinyl chloride, cis-1,2-DCE, 1,4-dioxane

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

Prior detection in Site groundwater

List those management units to be considered for scoring:

Groundwater

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

Presence in Site groundwater

Worksheet 4

Surface Water Route

CSID: 2622 **Site Name:** Burlington Environmental LLC Georgetown

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Trichloroethylene	8	3	X	4
Cis-1,2-dichloroethylene	6	X	3	X
Vinyl Chloride	8	5	X	7
1,4-dioxane	X	1	X	4

Highest Value 8

Bonus Points? 2

Human Health Toxicity Value 10

1.2 Environmental Toxicity

Substance	Acute Water Quality Criteria ug/L	Value	Non-human Mammalian Acute Toxicity mg/kg	Value
Trichloroethylene	2000	2	2402	3
Cis-1,2-dichloroethylene	224000	2	X	X
Vinyl Chloride	X	X	500	5
1,4-dioxane	X	X	5700	1

Environmental Toxicity Value 5

1.3 Substance Quantity

Amount: Approximately 1.95 acres

Basis: Estimated extent of impacted soil (entire site)

Substance Quantity Value 9

2.0 Migration Potential

2.1 Containment Containment Value 10

Explain Basis: Impacted groundwater is suspected to discharge to the LDW

2.2 Surface Soil Permeability Soil Permeability Value 3

Sand and silt

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 1

<2% slope

Worksheet 4

Surface Water Route

CSID: 2622 **Site Name:** Burlington Environmental LLC Georgetown

3.0 Targets

3.1 Distance to Surface Water	Surface Water Distance Value	4
4,200 feet to the LDW		
3.2 Population Served within 2 miles	Population Value	0
0 people		
3.3 Area Irrigated within 2 miles	Irrigation Value	0
0 acres		
3.4 Distance to Nearest Fishery Resource	Fishery Value	6
4,200 feet to the LDW		
3.5 Distance to and Name of Nearest Sensitive Environment	Sensitive Environment Value	12
Approximately 500 feet to the Georgetown Playfield		
4.0 Release	Release to Surface Water Value	0

Explain basis for scoring a release to surface water

No confirmed release to surface water

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}	152
MIG_S = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope	MIG_S	10
REL_S = Release to Surface Water	REL_S	0
TAR_{SH} = Distance to Surface Water + Population Served by Surface Water + Area Irrigated	TAR_{SH}	4.0
	SW_H	16.6

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}	97
MIG_S = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope	MIG_S	10
REL_S = Release to Surface Water	REL_S	0
TAR_{SE} = Distance to Surface Water + Distance to Fishery + Distance to Sensitive Environment	TAR_{SE}	22.0
	SW_E	31.5

Worksheet 5

Air Route

CSID: 2622 **Site Name:** Burlington Environmental LLC Georgetown

1.0 Substance Characteristics

1.1 Introduction (WARM Scoring Manual) - Please Review before scoring

1.2 Human Toxicity

Substance	Ambient Air Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Trichloroethylene	10	3	X	4
Vinyl chloride	10	1	X	X
Cis-1,2-dichloroethylene	1	3	X	X
1,4-Dioxane	4	5	X	X

Highest Value 10

Bonus Points? 2

Toxicity Value 12

1.3 Mobility

Gaseous Mobility	Max Value:	4
Particulate Mobility	Soil Type:	
	Erodibility:	
	Climatic Factor:	

Mobility Value 4

1.4 Final Human Health Toxicity/Mobility Matrix Value **HH Final Matrix Value** 24

1.5 Environmental Toxicity/Mobility

Substance	Non-human Mammalian Inhalation Toxicity (mg/m3)	Acute Value	Mobility Value	Table A-7 Matrix Value
Trichloroethylene	15583	3	4	6
Vinyl chloride	460123	1	4	2
Cis-1,2-dichloroethylene	65000	3	4	6
1,4-Dioxane	1694	5	4	10

Env. Final Matrix Value 10

1.6 Substance Quantity

Amount: Approximately 1.95 acres

Basis: Surface area of property and estimated extent of impacted soil

Substance Quantity Value 7

Worksheet 5

Air Route

CSID: 2622 **Site Name:** Burlington Environmental LLC Georgetown

2.0 Migration Potential

2.1 Containment Containment Value 0

Explain Basis: At least 2 feet of soil cover and a functioning vapor collection system

3.0 Targets

3.1 Nearest Population Population Distance Value 10

Approximately 500 feet to various commercial establishments, including restaurants

3.2 Distance to and name of nearest sensitive environments Sensitive Environment Value 7

Approximately 650 feet to Georgetown Playfield

3.3 Population within 0.5 miles Population Value 36

1,262 population

4.0 Release Release to Air Value 5

Explain basis for scoring a release to air:

Confirmed release to air

Pathway Scoring - Air Route, Human Health Pathway

$AIR_H = (SUB_{AH}*60/329)*[REL_A+(TAR_{AH}*35/85)]/24$

Where:

SUB_{AH} =(Human toxicity + 5) * (Containment + 1) + Substance Qty	SUB_{AH}	36
REL_A = Release to Air	REL_A	5
TAR_{AH} = Nearest Population + Population within 1/2 mile	TAR_{AH}	45.5
	AIR_H	6.5

Pathway Scoring - Air Route, Environmental Pathway

$AIR_E = (SUB_{AE}*60/329)*[REL_A+(TAR_{AE}*35/85)]/24$

Where:

SUB_{AE} =(Environmental Toxicity Value +5)*(Containment +1) +Substance Qty	SUB_{AE}	22
REL_A = Release to Air	REL_A	5
TAR_{AE} = Nearest Sensitive Environment	TAR_{AE}	7.0
	AIR_E	1.3

Worksheet 6

Groundwater Route

CSID: 12260 **Site Name:** West of 4th

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Trichloroethylene	8	3	X	4
Cis-1,2-dichloroethylene	6	X	3	X
Vinyl Chloride	8	5	X	7
1,4-dioxane	X	1	X	4

Highest Value 8

Bonus Points? 2

Toxicity Value 10

1.2 Mobility

Cations/Anions Max Value:

Solubility Max Value: 3 Mobility Value 3

1.3 Substance Quantity

Amount: Approximately 9,000 cubic yards

Basis: Estimated volume of impacted soil

Substance Quantity Value 5

2.0 Migration Potential

2.1 Containment Containment Value 10

Explain Basis: Contaminated soil/spill

2.2 Net Precipitation >10 to 20 inches Net Precipitation Value 2

2.3 Subsurface Hydraulic Conductivity Conductivity Value 3

Sand and silt

2.4 Vertical Depth to Groundwater 0 to 25 feet

Confirmed release: Yes Depth to Aquifer Value 8

Worksheet 6

Groundwater Route

CSID: 12260 **Site Name:** West of 4th

3.0 Targets

3.1 Groundwater Usage Aquifer Use Value: 2

Industrial

3.2 Distance to Nearest Drinking Water Well >10,000 feet

Well Distance Value: 0

3.3 Population Served within 2 Miles Population Served Value: 0

0 people

3.4 Area Irrigated by GW Wells within 2 miles Area Irrigated Value: 0

0 acres

4.0 Release Release to Groundwater Value: 5

Explain basis for scoring a release to groundwater:

Confirmed release to groundwater

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}	181
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}	2.0
	GW_H	35.5

Washington Ranking Method

Route Scores Summary and Ranking Calculation Sheet

Site Name: Burlington Environmental LLC Georgetown **CSID:** 2622

Site Address: 734 South Lucile Street **FSID:** 47779679

HUMAN HEALTH ROUTE SCORES

Enter Human Health Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	16.6	3
Air	6.5	1
Groundwater	35.5	3

H= 3
M= 3
L= 1

$$\frac{H^2 + 2M + L}{8} = \frac{9 + 6 + 1}{8}$$

Human Health Priority Bin Score: **2**

rounded up to next whole number

ENVIRONMENT ROUTE SCORES

Enter Environment Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	31.5	4
Air	1.3	1

H= 4
L= 1

$$\frac{H^2 + 2L}{7} = \frac{16 + 2}{7}$$

Environment Priority Bin Score: **3**

rounded up to next whole number

Comments/Notes:

FINAL MATRIX RANKING **4**

FOR REFERENCE:

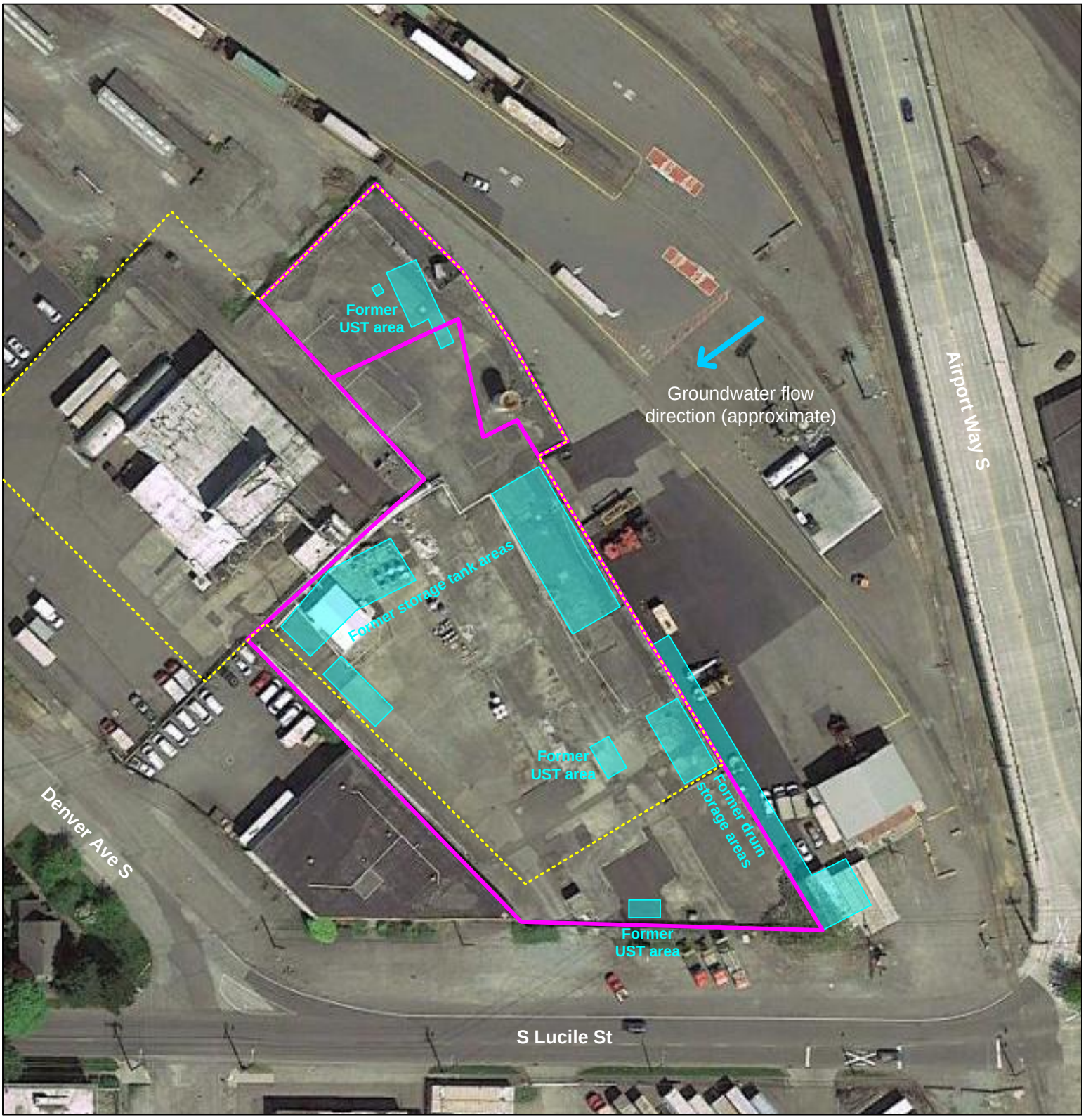
Final WARM Bin Ranking Matrix

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 - February 2015 Values

Quintile	Human Health Surface Water	Human Health Air	Human Health Ground Water	Environment Surface Water	Environment Air
5	>= 30.7	>= 37.6	>= 51.6	>= 50.9	>= 29.9
4	>= 23.1	>= 23.8	>= 40.9	>= 31.2	>= 22.5
3	>= 14.1	>= 15.5	>= 33.2	>= 23.6	>= 14.0
2	>= 7.0	>= 8.5	>= 23.5	>= 11.0	>= 1.6
1	<= 6.9	<= 8.4	<= 23.4	<= 10.9	<= 1.5

Quintile value associated with each route score entered above



Legend:

- Property location (approximate)
- Subsurface barrier wall location (approximate)
- Former storage area or tank location (approximate)

N

Approximately 75 feet

Notes:

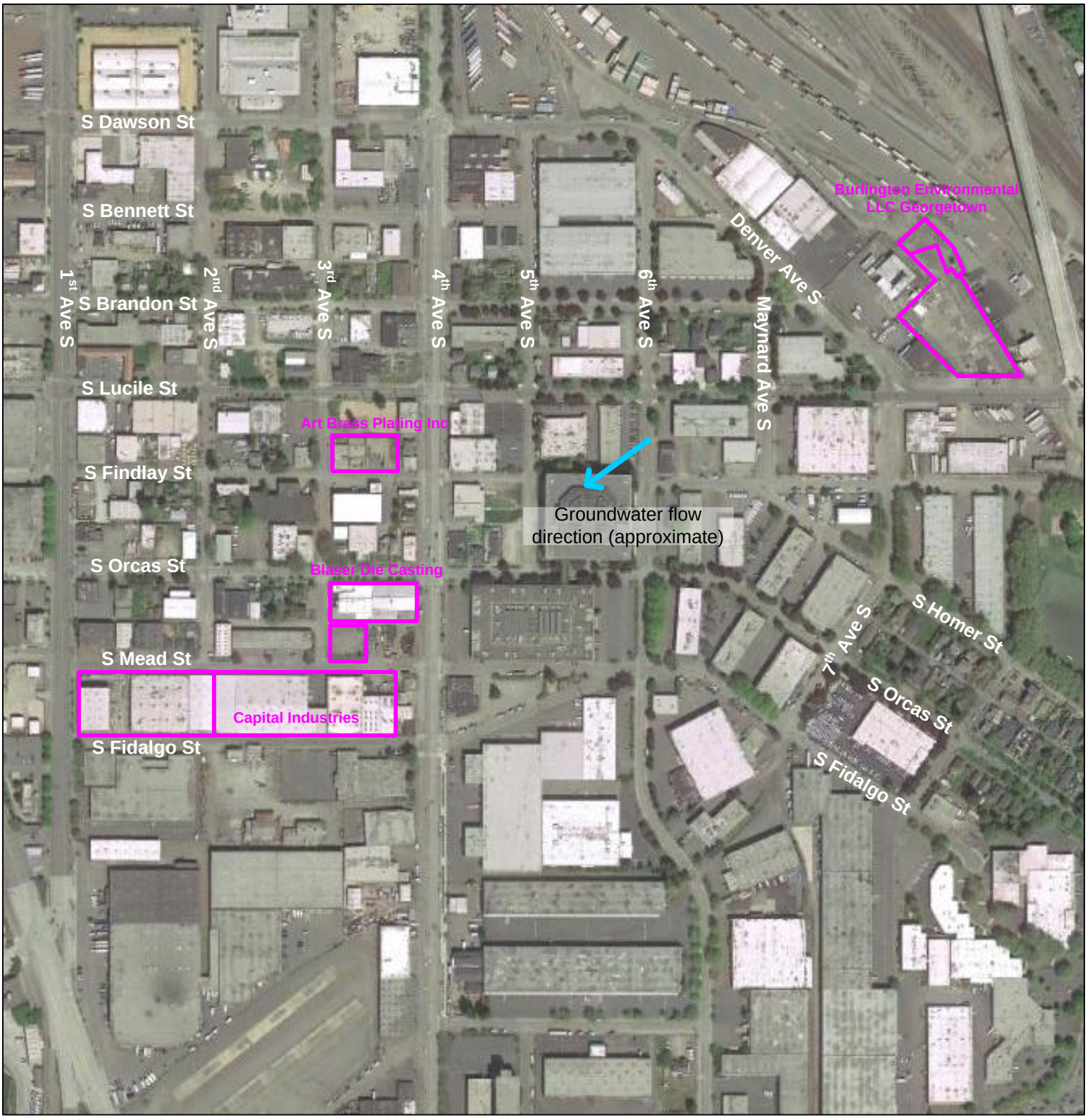
1. All locations are approximate, and not to scale.

Burlington Environmental LLC Georgetown
734 South Lucile Street
Seattle, WA 98108

DEPARTMENT OF ECOLOGY
State of Washington

Site Overview Map

CSID 2622
CSID2622.vsd



Legend:

Property location (approximate)

Notes:

1. All locations are approximate, and not to scale.

N

Approximately 370 feet

DEPARTMENT OF ECOLOGY
State of Washington

West of Fourth

Site Overview Map

CSID 12260

CSID12260.vsd