SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

SITE INFORMATION:

Cleanup Site ID: 3696

Sahlberg Equipment

Facility/Site ID: 2450

5950 4th Ave S

Seattle, King County, WA 98108

Section:	20	Latitude:	47.54869
Township:	24N	Longitude:	-122.32919
Range:	4E	Tax/Parcel ID:	5367204735

Site Scored/ranked for the February 2015 Hazardous Sites List Publication

SITE DESCRIPTION:

The Sahlberg Equipment site (Site) is a former construction and safety equipment retail facility located in Seattle, King County, Washington. The 1.02-acre property is located approximately 1,450 feet from the Lower Duwamish Waterway (LDW), and zoned for industrial (IG2 U/85) use.

Adjacent properties include storage warehouses to the east, west, and north, and a parking lot and warehouse to the south. Beyond a warehouse to the west is the Consolidated Freightways state cleanup site (Cleanup Site ID (CSID) 6262).

The Site is currently operated as a office building by Society of St Vincent De Paul.

Current activities at the Site include the operation of an office for the Society of St. Vincent De Paul King County Council, as well as activities to support the operation of several thrift stores.

The Site is located at the northeast corner of 4th Avenue South and South Front Street.

Former waste handling practices at the Site have reportedly included an equipment wash area with several sumps near the southeast corner of the property, an unpaved drum storage area in the southeast corner of the property, and an underground storage tank (UST) (contents unknown) located in the northwest corner of the property. United Cleaners reportedly formerly operated in the southwest corner of the property.

SITE BACKGROUND:

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

From	To	Operator/Tenant	Activity
1940	1950		Single family residences
	1955	Seattle Pacific Engineering	
1940	1955	Joseph Conradi and Company	
1955	1957	United Textile Company	
1940	1965	Anderson Blowpipe and Manufacturing Company	
1957	1965	Western Processing	
1955	1993	Jack Sahlberg Equipment Company	Equipment retailer
1993	2014	Society of St Vincent De Paul	Office building and thrift store

SITE CONTAMINATION:

In 1992 the Sahlberg Equipment site was reported to Washington State Department of Ecology (Ecology) and placed on the Confirmed and Suspected Contaminated Sites (CSCSL) list with ID number 3696.

SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

The Site was reported to Ecology in 1992, after an environmental assessment was conducted at the Site, and petroleum products and halogenated organics were detected in groundwater at the site. Four soil borings were advanced at the Site, two of which were completed as monitoring wells. The locations of the soil borings not completed as monitoring wells are unknown. Groundwater was encountered at approximately 5 feet below ground surface (bgs), and soil samples were collected from four boring locations. The reason for conducting a subsurface investigation was not noted, though subsequent documents indicate that there may have been visual evidence (location unknown) of petroleum-impacted soils due to improper drum handling and equipment washing activities at the Site. A soil sample collected from one of the soil borings (location unknown) contained 5,100 milligrams per kilogram (mg/kg) oil, above the Model Toxics Control Act (MTCA) Method A cleanup level. Other soil samples collected from soil borings did not contain diesel or oil at concentrations above the MTCA Method A cleanup levels. Groundwater samples contained diesel and oil at concentrations above MTCA Method A cleanup levels, and the groundwater sample collected from MW-2 also contained concentrations of chlorobenzene and xylenes above the MTCA Method A (or B, for chlorobenzene) cleanup levels. Petroleum-impacted soils were suspected to be present at depths greater than 4 feet bgs.

One 300-gallon oil UST was reportedly present at the site in 1991. The UST was reportedly removed in 1992, though no documentation associated with this UST removal was available for review.

PAST REMEDIATION ACTIVITIES:

In 1993, five soil borings were advanced at the Site, two of which were completed as monitoring wells (soil borings A, B, and C; MW-A and MW-B). Soil samples were collected from the soil borings, and groundwater was collected from the two existing and two newly constructed monitoring wells. Diesel was detected in soil borings A, B, and C and monitoring wells MW-A and MW-B at concentrations below the MTCA Method A cleanup level. Groundwater samples collected from MW-1 and MW-2 contained diesel (1,800 micrograms per liter (ug/L) and 8,300 ug/L respectively) at concentrations above the MTCA Method A cleanup level, and groundwater from MW-2 also contained oil-range petroleum hydrocarbons at a concentration above the MTCA Method A cleanup level. The concentrations in the remaining monitoring wells were reported as below 1,000 ug/L, however the current MTCA Method A cleanup levels for oil and diesel are 500 ug/L. The groundwater samples did not contain benzene, toluene, ethylbenzene, or xylenes (BTEX) at concentrations above the MTCA Method A cleanup levels.

Soil was excavated in the southeast corner of the Site, where petroleum-impacted soil had been previously documented, and approximately 40 cubic yards of petroleum-impacted soil was disposed offsite. As part of this excavation, MW-1 and MW-2 were destroyed. Petroleum-impacted soils were reportedly encountered at approximately 3.5 feet bgs, in a compacted sand layer. Stockpiled soil was screened using a photoionization detector (PID) to measure organic vapors, and if volatile organic compound (VOC) concentrations were less than 30 ppm, the soil was used to backfill the excavation. Confirmation soil samples collected from the sidewalls and excavation base were submitted for laboratory analysis and reportedly contained concentrations of gasoline, diesel, and oil below the MTCA Method A cleanup levels.

In May 1993, MW-B was destroyed, and two new monitoring wells (also named MW-1 and MW-2) were installed at the Site in the approximate locations of the destroyed wells (original MW-1 and MW-2). Groundwater samples collected from the two new wells contained concentrations of diesel above the MTCA Method A cleanup level, and chlorobenzene above the MTCA Method B (non-carcinogenic) cleanup level. Groundwater was sampled again in July 1993, and chlorobenzene was again present at a concentration above the MTCA Method B (non-carcinogenic) cleanup level, though at a lower concentration than in May 1993.

In December 1993, the property was sold to the Society of St. Vincent de Paul.

CURRENT SITE CONDITIONS:

Prior to a 1993 remedial excavation, Site soil contained concentrations of diesel and oil above the MTCA Method A cleanup levels. Site groundwater was most recently analyzed in 1993 following remedial excavation activities, and contained diesel and chlorobenzene at concentrations above the MTCA Method A or B (non-carcinogenic) cleanup levels. The last reported detection of xylenes in groundwater was in 1992. Groundwater at the site has not been analyzed for gasoline-range petroleum hydrocarbons. Soils and groundwater at the site have not been analyzed for metals.

The approximate depth to groundwater is 4 to 10 feet below ground surface, with groundwater flowing to the west

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Worksheet 1
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(estimated based on topography). Subsurface soils are silty fine to medium coarse sand (based on soils encountered in the excavation and soil borings).

SPECIAL CONSIDERATIONS:

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

☑ **Surface Water**

Prior identification of chlorobenzene, xylenes, oil, and diesel in Site groundwater and/or soils at concentrations above the MTCA Method A or B cleanup levels. The surface water route is scored to account for the potential of groundwater interaction with surface water in the LDW.

☑ **Air**

Release of volatile compounds occurred to Site soils. Diesel and oil are not expected to impact this route due to low volatility.

☑ **Groundwater**

Site groundwater (as of 1993) contains diesel, oil, and chlorobenzene at concentrations above the respective MTCA Method A or B cleanup levels. Xylenes were detected in site groundwater in 1992.

No tidal fluctuations in groundwater levels have been documented at the site, however a state cleanup site located approximately 300 feet west of the site (Consolidated Freightways, CSID 6262) has documented tidal fluctuations in groundwater, so groundwater is expected to be hydraulically connected and discharge to the Lower Duwamish Waterway.

While oil has been detected in Site soil and groundwater, the Washington Ranking Method (WARM) does not include toxicity data for oil, so the Site is scored for diesel, chlorobenzene, and xylenes.

ROUTE SCORES:

Surface Water/ Human Health:	19.8	Surface Water/ Environment:	29.0
Air/ Human Health:	6.3	Air/ Environment:	1.2
Groundwater/ Human Health:	37.1		

Overall Rank: 4

REFERENCES:

1 1993, Real Estate Excise Tax Affadavit. December 13, 1993.

2 Applied Geotechnology Inc., 1993, Environmental Assessment Sahlberg Equipment Property 5950 4th Avenue South Seattle, Washington. June 17, 1993.

3 Applied Geotechnology Inc., 1993, Recent Data Review Sahlberg Equipment Property 5950 4th Avenue South Seattle, Washington. July 20, 1993.

4 Ecology Water Resources Explorer, accessed July 2014. https://fortress.wa.gov/ecy/waterresources/map/WaterResourcesExplorer.aspx

5 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

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

7 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

8 O'Herron, Mary, 1993, Conversation Record: Sahlberg/U.S. Bank 10236. January 6, 1993.

9 O'Herron, Mary, 1993, Independent Cleanup Reports, Site Name: Sahlberg Equipment. 7/21/1993.

10 Pacific Testing Laboratories, 1993, Ground Water Monitoring Well Installation and Analysis. Prepared for U.S. Bank - Trust Real Estate. May 25, 1993.

11 Pacific Testing Laboratories, 1993, Sample Results from Sahlberg Equipment, Seattle, Washington. July 21, 1993.

12 Pacific Testing Laboratories, 1993, Site Characterization and Soil Remediation at Sahlberg Equipment, Inc. Property, Seattle, Washington. March 15, 1993.

13 Rittenhouse-Zeman and Associates, 1991, Level 1 Environmental Site Assessment Sahlberg Equipment, Inc. Property 5940 4th Avenue South Seattle, Washington. Prepared for U.S. Bank. April 1991.

14 Rittenhouse-Zeman and Associates, 1992, Environmental Assessment Sahlberg Equipment Facility 5950 Fourth Avenue South Seattle, Washington. Prepared for U.S. Bank of Washington. May 1992.

15 WARM Scoring Manual

16 WARM Toxicological Database

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

18 Washington State Department of Ecology and Puget Sound Partnership, 2009, Letter Re: Results from the Urban Waters Environmental Compliance Inspection at Society of St. Vincent de Paul Council of Seattle on April 15, 2009: Corrective Action Required. April 23, 2009.

19 Washington State Department of Ecology, 1991, ERT Report #N5445. July 26, 1991.

20 Washington State Department of Ecology, 1993, Limited Review of Existing Files for Sahlberg Equipment Property.

SITE HAZARD ASSESSMENT
Worksheet 2
Route Documentation

Cleanup Site ID: 3696 Sahlberg Equipment

Facility/Site ID: 2450

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

Diesel, chlorobenzene, xylenes

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

Prior detection in Site soil and/or groundwater

List those management units to be considered for scoring:

Surface water (LDW)

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

Potential for interaction between impacted groundwater and surface water

2. AIR ROUTE

List those substances to be considered for scoring:

Chlorobenzene, xylenes

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

Prior detection in site soil or groundwater at concentrations above their respective MTCA Method A or B cleanup levels

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:

Diesel, chlorobenzene, xylenes

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

Prior detection in Site groundwater at concentrations above their respective MTCA Method A or B cleanup levels

List those management units to be considered for scoring:

Groundwater

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

Prior detection in Site groundwater

Worksheet 4

Surface Water Route

CSID: 3696 **Site Name:** Sahlberg Equipment

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Diesel	4	5	3	X
Chlorobenzene	6	3	1	X
Xylenes	2	10	1	X

Highest Value	10
Bonus Points?	2
Human Health Toxicity Value	12

1.2 Environmental Toxicity

	Acute Water Quality Criteria		Non-human Mammalian Acute Toxicity	
Substance	ug/L	Value	mg/kg	Value
Diesel	2350	2	490	5
Chlorobenzene	160	4	2290	3
Xylenes	X	X	5000	3

Environmental Toxicity Value	4

1.3 Substance Quantity

Amount: Approximately 300 square feet

Basis: Estimated extent of remaining impacted soil and groundwater area

Substance Quantity Value: 5

2.0 Migration Potential

2.1 Containment — Containment Value: 10

Explain Basis: Impacted groundwater may discharge to surface water

2.2 Surface Soil Permeability — Soil Permeability Value: 3

Site is paved, but sands and silts beneath

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 the floodplain

2.6 Terrain Slope — Slope Value: 1

Less than 2% slope

Worksheet 4

Surface Water Route

CSID: 3696 **Site Name:** Sahlberg Equipment

3.0 Targets

3.1 Distance to Surface Water	Surface Water Distance Value	7
Approximately 1,450 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	9
Approximately 1,450 feet to the LDW		
3.5 Distance to and Name of Nearest Sensitive Environment	Sensitive Environment Value	9
Approximately 1,450 feet to the LDW; 1,040 feet to Oxbow Park		

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}	170
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}	7.0
	SW_H	19.8

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}	82
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}	25.0
	SW_E	29.0

Worksheet 5

Air Route

CSID: 6262 **Site Name:** Sahlberg Equipment

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
Chlorobenzene	1	X	3	X
Xylenes	1	3	1	X

Highest Value 3

Bonus Points? 0

Toxicity Value 3

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** 6

1.5 Environmental Toxicity/Mobility

Substance	Non-human Mammalian Inhalation Toxicity (mg/m3)	Acute Value	Mobility Value	Table A-7 Matrix Value
Chlorobenzene	X	X	4	X
Xylenes	21714	3	3	5

Env. Final Matrix Value 5

1.6 Substance Quantity

Amount: Approximately 300 square feet

Basis: Estimated extent of remaining impacted soil and groundwater area

Substance Quantity Value 2

Worksheet 5

Air Route

CSID: 6262 **Site Name:** Sahlberg Equipment

2.0 Migration Potential

2.1 Containment Containment Value: 5

Explain Basis: At least 2 feet of soil cover but no vapor containment system present

3.0 Targets

3.1 Nearest Population Population Distance Value: 8

Approximately 1,040 feet to Oxbow Park

3.2 Distance to and name of nearest sensitive environments Sensitive Environment Value: 6

Approximately 1,450 feet to the LDW

3.3 Population within 0.5 miles Population Value: 22

469 population

4.0 Release Release to Air Value: 0

Explain basis for scoring a release to air:

No confimed 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}	68
REL_A = Release to Air	REL_A	0
TAR_{AH} = Nearest Population + Population within 1/2 mile	TAR_{AH}	29.7
	AIR_H	6.3

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}	62
REL_A = Release to Air	REL_A	0
TAR_{AE} = Nearest Sensitive Environment	TAR_{AE}	6.0
	AIR_E	1.2

Worksheet 6

Groundwater Route

CSID: 6262 **Site Name:** Sahlberg Equipment

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Diesel	4	5	3	X
Chlorobenzene	6	3	1	X
Xylenes	2	10	1	X

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: Approximately 30 cubic yards

Basis: Estimated volume of impacted soil

Substance Quantity Value 2

2.0 Migration Potential

2.1 Containment Containment Value 10

Explain Basis: Contaminated soil

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

2.3 Subsurface Hydraulic Conductivity Conductivity Value 3

Silty fine to medium sand

2.4 Vertical Depth to Groundwater 7 feet

Confirmed release: Yes Depth to Aquifer Value 8

3.0 Targets

3.1 Groundwater Usage Aquifer Use Value 2

Groundwater not used, but usable, or used for irrigation of non-food crops

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

Worksheet 6

Groundwater Route

CSID: 6262 **Site Name:** Sahlberg Equipment

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}	189
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	37.1

Washington Ranking Method

Route Scores Summary and Ranking Calculation Sheet

Site Name: Sahlberg Equipment **CSID:** 3696

Site Address: 5950 4th Avenue South **FSID:** 2450

HUMAN HEALTH ROUTE SCORES

Enter Human Health Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	19.8	3
Air	6.3	1
Groundwater	37.1	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	29.0	3
Air	1.2	1

H= 3
L= 1

$$\frac{H^2 + 2L}{7} = \frac{9 + 2}{7}$$

Environment Priority Bin Score: **2**

rounded up to next whole number

Comments/Notes:

FINAL MATRIX RANKING **4**

FOR REFERENCE:

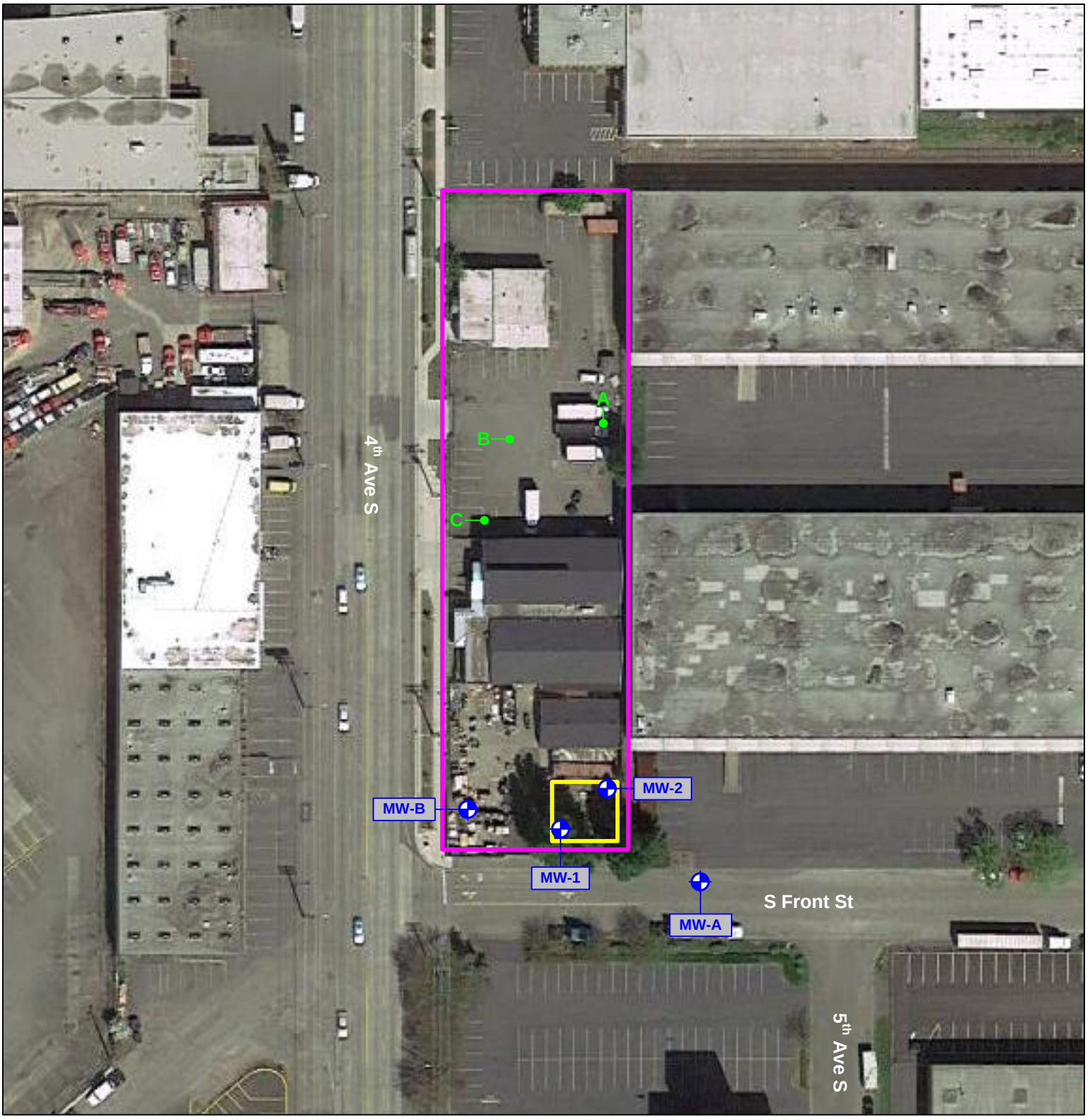
Final WARM Bin Ranking Matrix

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 - August 2014 Values

Quintile	Human Health: Surface Water	Human Health: Air	Human Health: Ground Water	Environment: Surface Water	Environment: Air
5	>= 30.7	>= 37.3	>= 51.9	>= 49.8	>= 30.3
4	>= 22.5	>= 23.0	>= 41.0	>= 30.9	>= 23.0
3	>= 13.0	>= 14.5	>= 33.1	>= 23.2	>= 14.1
2	>= 6.8	>= 8.1	>= 23.5	>= 10.7	>= 1.6
1	<= 6.7	< 8.1	<= 23.4	<= 10.6	<= 1.5

Quintile value associated with each route score entered above



Legend:

- Property location (approximate)
- Excavation area (approximate)
- Monitoring well (approximate)
- Soil boring/soil sample location (approximate)

Notes:

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

N

DEPARTMENT OF ECOLOGY
State of Washington

Sahlberg Equipment
5950 4th Avenue South
Seattle, WA 98108

Site Overview Map

CSID 3696
CSID3696.vsd