SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

SITE INFORMATION:

Cleanup Site ID: 3548

Art Brass Plating Inc Seattle

Facility/Site ID: 88531932

5516 3rd Ave S

Seattle, King County, WA 98108

Section:	20	Latitude:	47.55283
Township:	24N	Longitude:	-122.33059
Range:	4E	Tax/Parcel ID:	5263300240

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

SITE DESCRIPTION:

The Art Brass Plating Inc Seattle site (Site) is a former (and current) metal finishing business located in Seattle, King County, Washington. The 0.46-acre property is located approximately 2,300 feet from the Lower Duwamish Waterway (LDW), and zoned for industrial (IG2 U/85) use.

Adjacent properties include a vacant property to the north, several restaurants to the east, and several warehouses to the south and west.

The Site is currently operated as a metal finishing business by Carmen Rose Allstrom.

The Art Brass Plating (ABP) site is currently operated as a metal finishing business, including plating and polishing of metals such as zinc, aluminum, stainless steel, copper, and iron. The ABP site reportedly operates a toluene spray booth at the site. The ABP site has operated as a metal plating facility since 1983. Until 2004, trichloroethylene (TCE) was reportedly used at the ABP site as a degreaser.

This Site is one of four subsites of the West of Fourth cleanup site (Cleanup Site ID [CSID] 12260), listed for commingled groundwater plumes in the Georgetown area of Seattle. The three other subsites are Blaser Die Casting Co (CSID 1588/FSID 7118747, 5700 3rd Avenue South, tax parcel 1722801495), Capital Industries Inc (CSID 4527/FSID 11598755, 5801 3rd Avenue South, tax parcels 1722801620 and 1722802255), and Burlington Environmental LLC Georgetown, also known as Philip Services Corporation (PSC) (CSID 2622/FSID 47779679, 734 South Lucile Street, tax parcels 5084400124, 1722800206). 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	Helen V. Warner	
1986	2013	Evan Dean and Carmen R Allstrom	Metal finishing -- plating and powder coating
2013	2014	Carmen Rose Allstrom	Metal finishing -- plating and powder coating

SITE CONTAMINATION:

In 2005 the Art Brass Plating Inc Seattle site was reported to Washington State Department of Ecology (Ecology) and placed on the Voluntary Cleanup Program (VCP) list with ID number NW1484.

The ABP site has been listed on EPA's Toxics Release Inventory (TRI) list for chromium and nickel compounds. Additionally, the ABP site has been in non-compliance during several dangerous waste inspections (1997 through 1999). A final warning letter issued by Ecology in 1998 led to a soil and groundwater sampling investigation, which was conducted in March 1999. During this soil and groundwater investigation, two soil borings were advanced at the site in locations where a release to soil may have occurred, and two soil and two groundwater samples were

collected. However, this investigation reportedly did not identify concentrations of cyanide, chromium, copper, lead, nickel, or zinc above the Model Toxics Control Act (MTCA) Method A cleanup levels, except for one groundwater sample which reportedly contained chromium at a concentration slightly above the MTCA Method A cleanup level. This data was not available for review.

PAST REMEDIATION ACTIVITIES:

In 2005 and 2006, Aspect Consulting conducted two site investigations and a data gaps investigation, which confirmed the release of TCE to soil and groundwater. In 2007, a pilot test for soil vapor extraction (SVE) and air sparging (AS) was completed at the Site, and in 2008, an AS/SVE system was installed at the site. TCE concentrations in groundwater approximately 100 feet downgradient of the ABP site had reportedly decreased by 2012, however analytical results were not available for review.

Vapor intrusion mitigation systems have been installed at the Site and several surrounding residential and commercial properties. Vapor mitigation systems are either sub-membrane depressurization systems, or sub-slab depressurization systems. The ABP Site has a sub-slab depressurization system.

A Remedial Investigation (RI) was completed in 2012 for Art Brass Plating under Agreed Order DE #5296. As part of the RI, sediment porewater was sampled from the downgradient section of the LDW, within the potential groundwater discharge zone for the Site. TCE, cis-1,2-DCE, and vinyl chloride were detected in sediment porewater within the LDW potential groundwater discharge zone.

CURRENT SITE CONDITIONS:

In 2014, TCE and its degradation products cis-1,2-dichloroethylene (cis-1,2-DCE) and vinyl chloride were present in groundwater at concentrations above their respective MTCA Method A or B cleanup levels. Reportedly, of the three groundwater intervals sampled, the highest concentrations of TCE in groundwater were detected in the western portion of the ABP site at depths near the water table, but not deeper than 20 feet bgs. Plating solution was reportedly historically released at the site, resulting in low pH and elevated concentrations of metals in near surface soil and groundwater.

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

Release is expected to have occurred to subsurface soils, however groundwater at the Site has been documented to have interaction with surface water in the LDW.

☑ **Air**

Groundwater contains concentrations of VOCs above their respective MTCA Method A or B cleanup levels, which may be available for transport via the air route. Mitigation measures implemented at the Site are expected to decrease, but not eliminate, the likelihood of vapor intrusion via the air route.

☑ **Groundwater**

Site groundwater contains concentrations of VOCs above their respective MTCA Method A or B cleanup levels.

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.

Other chemicals not listed on Worksheets 4 and 6 that may be present in Site groundwater (e.g. metals) would not affect the route scoring for this Site.

SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

ROUTE SCORES:

Surface Water/ Human Health:	24.6	Surface Water/ Environment:	43.3
Air/ Human Health:	4.1	Air/ Environment:	0.9
Groundwater/ Human Health:	35.1		

Overall Rank: 3

REFERENCES:

1 Aspect Consulting, 2012, Remedial Investigation Report Art Brass Plating. Prepared for Art Brass Plating. September 27, 2012.

2 Aspect Consulting, 2014, Letter Re: Progress Report -- January through March 2014 Art Brass Plating, Seattle, Washington Agreed Order No. DE 10402. June 20, 2014.

3 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

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

5 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

6 Pioneer Technologies Corporation, 2011, Memo Re: Georgetown: Final Vapor Intrusion System Shutdown and Removal Process (Tier 5). May 3, 2011.

7 WARM Scoring Manual

8 WARM Toxicological Database

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

SITE HAZARD ASSESSMENT
Worksheet 2
Route Documentation

Cleanup Site ID: 3548 Art Brass Plating Inc Seattle

Facility/Site ID: 88531932

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

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

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

Prior detection in Site groundwater at concentrations above the MTCA Method A cleanup levels

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 groundwater to impact surface water; detection of TCE, cis-1,2-DCE, and vinyl chloride in sediment porewater samples downgradient of the Site's groundwater plume

2. AIR ROUTE

List those substances to be considered for scoring:

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

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

Prior detection in Site groundwater at concentrations above MTCA Method A cleanup levels

List those management units to be considered for scoring:

Vapor

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

Detection of volatile hazardous substances in Site groundwater and soils at levels posting a potential vapor intrusion threat

3. GROUNDWATER ROUTE

List those substances to be considered for scoring:

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

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

Prior detection in Site groundwater at concentrations above the MTCA Method A 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: 3548 **Site Name:** Art Brass Plating

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
Arsenic	8	5	5	7

Highest Value 8

Bonus Points? 2

Human Health Toxicity Value 10

1.2 Environmental Toxicity

	Acute Water Quality Criteria		Non-human Mammalian Acute Toxicity	
Substance	ug/L	Value	mg/kg	Value
Trichloroethylene	2000	2	2402	3
Cis-1,2-dichloroethylene	224000	2	X	X
Vinyl Chloride	X	X	500	5
Arsenic	69	6	763	5

Environmental Toxicity Value 6

1.3 Substance Quantity

Amount: 10,000 square feet

Basis: Estimated extent of impacted soil

Substance Quantity Value 7

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: 3548 **Site Name:** Art Brass Plating

3.0 Targets

3.1 Distance to Surface Water	Surface Water Distance Value	7
2,300 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
2,300 feet to the LDW		
3.5 Distance to and Name of Nearest Sensitive Environment	Sensitive Environment Value	9
2,300 feet to the LDW		

4.0 Release	Release to Surface Water Value	5

Explain basis for scoring a release to surface water

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}	150
MIG_S = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope	MIG_S	10
REL_S = Release to Surface Water	REL_S	5
TAR_{SH} = Distance to Surface Water + Population Served by Surface Water + Area Irrigated	TAR_{SH}	7.0
	SW_H	24.6

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}	106
MIG_S = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope	MIG_S	10
REL_S = Release to Surface Water	REL_S	5
TAR_{SE} = Distance to Surface Water + Distance to Fishery + Distance to Sensitive Environment	TAR_{SE}	25.0
	SW_E	43.3

Worksheet 5

Air Route

CSID: 3548 **Site Name:** Art Brass Plating

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
Cis-1,2-dichloroethylene	1	3	X	X
Vinyl chloride	10	1	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
Cis-1,2-dichloroethylene	65000	3	4	6
Vinyl chloride	460123	1	4	2

Env. Final Matrix Value 6

1.6 Substance Quantity

Amount: 10,000 square feet

Basis: Estimated surface area of impacted soil

Substance Quantity Value 5

Worksheet 5

Air Route

CSID: 3548 **Site Name:** Art Brass Plating

2.0 Migration Potential

2.1 Containment Containment Value: 0

Explain Basis: At least 2 feet of soil cover, and a vapor collection system is present and functioning at the Site

3.0 Targets

3.1 Nearest Population Population Distance Value: 10

Less than 300 feet to the nearest dwelling

3.2 Distance to and name of nearest sensitive environments Sensitive Environment Value: 5

Approximately 2,100 feet to the Georgetown Playfield

3.3 Population within 0.5 miles Population Value: 16

267 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}	34
REL_A = Release to Air	REL_A	5
TAR_{AH} = Nearest Population + Population within 1/2 mile	TAR_{AH}	26.3
	AIR_H	4.1

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}	16
REL_A = Release to Air	REL_A	5
TAR_{AE} = Nearest Sensitive Environment	TAR_{AE}	5.0
	AIR_E	0.9

Worksheet 6

Groundwater Route

CSID: 3548 **Site Name:** Art Brass Plating

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
TCE	8	3	X	4
Cis-1,2-DCE	6	X	3	X
Vinyl Chloride	8	5	X	7
Arsenic	8	5	5	7

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 1,000 cubic yards

Basis: Estimated extent of impacted soil

Substance Quantity Value 3

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: 3548 **Site Name:** Art Brass Plating

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}	179
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	35.1

Washington Ranking Method

Route Scores Summary and Ranking Calculation Sheet

Site Name: Art Brass Plating Inc Seattle **CSID:** 3548

Site Address: 5516 3rd Avenue South **FSID:** 88531932

HUMAN HEALTH ROUTE SCORES

Enter Human Health Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	24.6	4
Air	4.1	1
Groundwater	35.1	3

H= 4
M= 3
L= 1

$$\frac{H^2 + 2M + L}{8} = \frac{16 + 6 + 1}{8}$$

Human Health Priority Bin Score: **3**

rounded up to next whole number

ENVIRONMENT ROUTE SCORES

Enter Environment Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	43.3	4
Air	0.9	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 **3**

FOR REFERENCE:

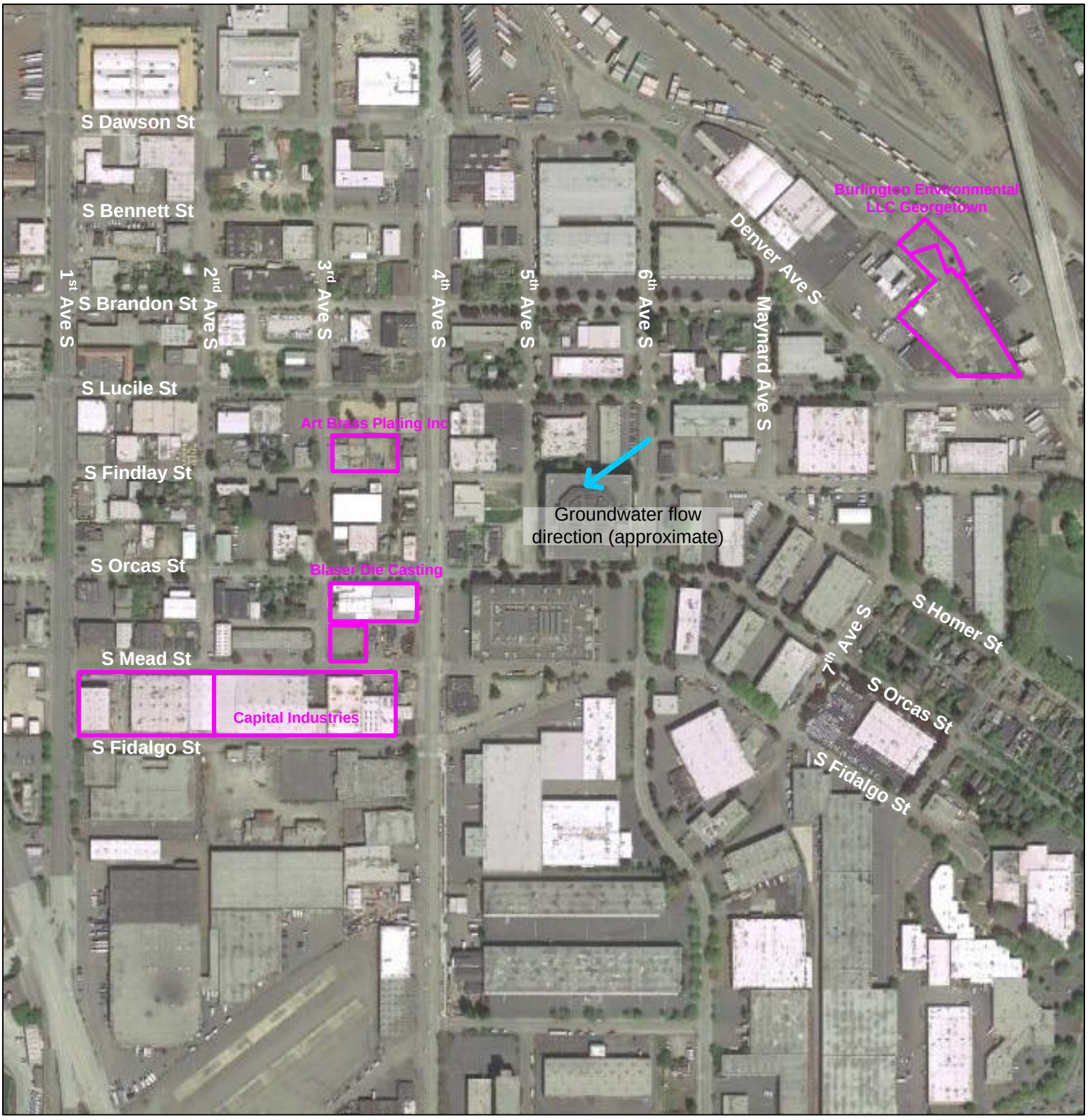
Final WARM Bin Ranking Matrix

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)

Notes:

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

N

Approximately 370 feet

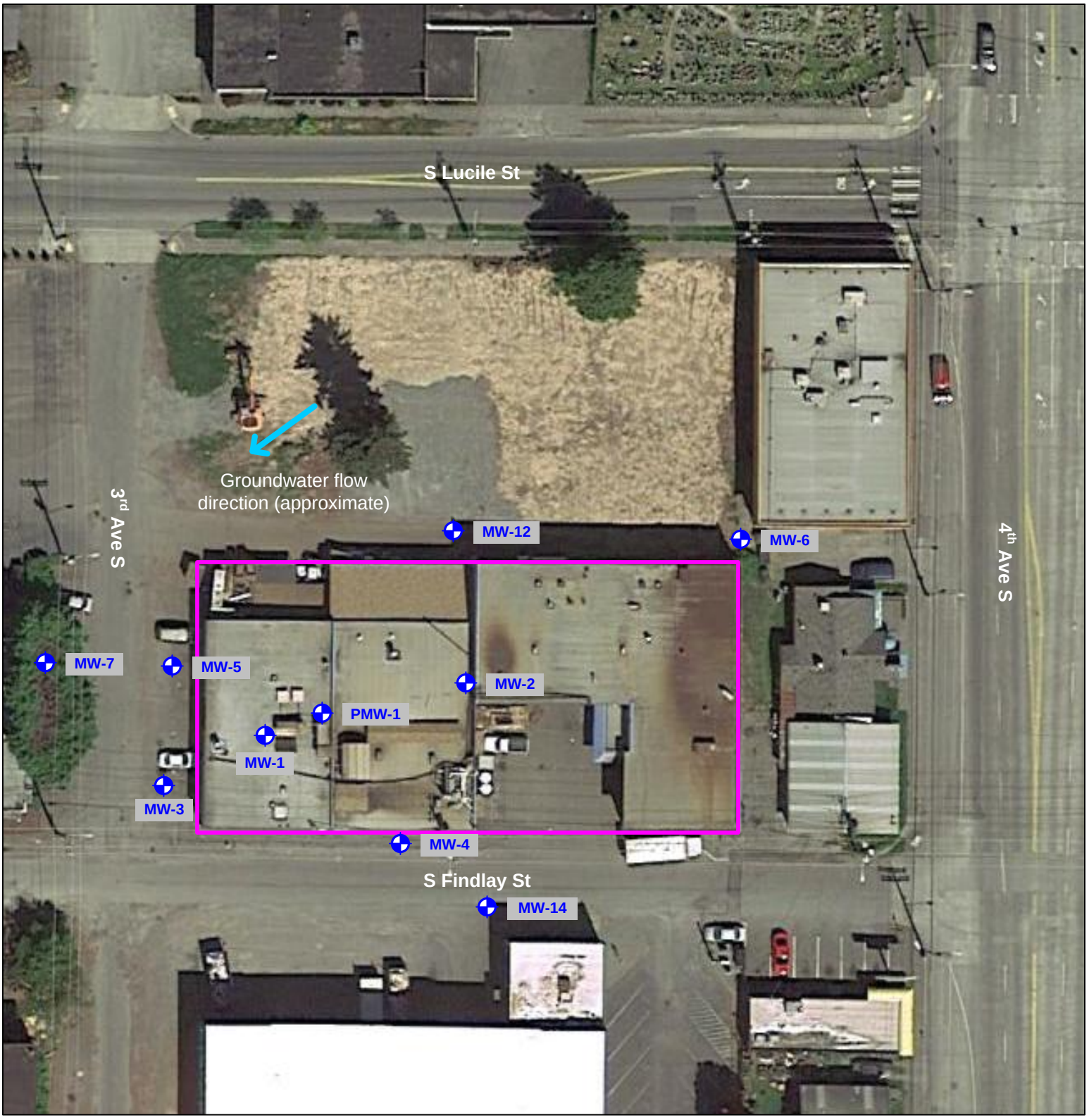
DEPARTMENT OF ECOLOGY
State of Washington

West of Fourth

Site Overview Map

CSID 12260

CSID12260.vsd



Legend:

- Property location (approximate)
- Monitoring well (approximate)

N

Approximately 50 feet

Notes:

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

Art Brass Plating Inc Seattle
5516 3rd Avenue South
Seattle, WA 98108

DEPARTMENT OF ECOLOGY
State of Washington

Site Overview Map

CSID 3548
CSID3548.vsd