# SITE HAZARD ASSESSMENT
# Worksheet 1
# Summary Score Sheet

## SITE INFORMATION:

Cleanup Site ID: 12463

Snopac Property

Facility/Site ID: 1523145

5055 E Marginal Way

Seattle, King County, WA 98108

| | | | |
|---|---|---|---|
| Section: | 19 | Latitude: | 47.55602 |
| Township: | 24N | Longitude: | -122.33879 |
| Range: | 4E | Tax/Parcel ID: | 3573201061 |

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

## SITE DESCRIPTION:

The Snopac Property site (Site) is a former warehouse located in Seattle, King County, Washington. The 1.33-acre property is located adjacent to Slip 1 of the Lower Duwamish Waterway (LDW), and zoned for industrial (IG1 U/85) use.

The Site is located along the west side of East Marginal Way South. Adjacent properties include Federal Center South to the north, Manson Construction to the south, and several industrial warehouses to the east, across East Marginal Way South.

The Site is currently operated as a vacant property or storage for Manson Construction by 5055 Properties, LLC.

Previous activities at the Site include ship building, coal burning, and maintenance and repair of engines, boats, and other equipment. The Site was most recently occupied by Snopac Products, Inc., a fish processing company, though the property has reportedly been vacant since 2008. Previous occupants of the Site included Pioneer Towing Company, Olympic Lighterage Company, Stores Delivery Service, Marine Power and Equipment, Interstate Transit Company/Jordan Terminal, and Emerson GM Diesel. The exact occupancy dates are unknown.

The Site is located within the Slip 1 (river mile 0.9 to 1.0 East) Source Control Area for the LDW.

## SITE BACKGROUND:

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

| From | To | Operator/Tenant | Activity |
|---|---|---|---|
| | 1973 | Various | Jordon Terminals, Ladysmith Coal Company, Western Containers, Inc., Pioneer Towing, Glacier Sand and Gravel, Boeing Company, Safeway Stores |
| 1973 | 1988 | Marine Leasing Corp./ Marine Logistics Corp. | Marine Power & Equipment |
| 1988 | 1989 | United Marine Shipbuilding | Marine Power & Equipment |
| 1989 | 2012 | Snopac Products Inc. | Warehouse for fish processing business |
| 2012 | 2015 | 5055 Properties, LLC | Vacant; storage for Manson Construction |

## SITE CONTAMINATION:

In 2011 the Snopac Property site was reported to Washington State Department of Ecology (Ecology) and placed on the Confirmed and Suspected Contaminated Sites (CSCSL) list with ID number 12463.

In 1989, three underground storage tanks (USTs) were excavated and removed from the Site, including one

1,000-gallon diesel UST, one 2,500-gallon diesel UST, and one 10,000-gallon diesel UST. Reportedly, no contamination was observed in the UST excavation.

One seep (seep 76) has been identified at the Site, near the southeast corner of Slip 1. Water from this seep was sampled in 2004, and arsenic was detected in the seep water at concentrations above the MTCA Method B cleanup level for surface water. The concentration of mercury in an unfiltered seep sample was above the marine chronic water quality criteria, and below the marine acute water quality criteria. The concentration of zinc in the filtered sample was below the MTCA Method B cleanup level, but above the marine acute and chronic water quality criteria. Copper and lead were also detected in the sample, but at concentrations below the MTCA Method B cleanup level (copper), or below the acute water quality criteria for marine aquatic life (lead).

In August and October 2011, a total of 25 soil borings were advanced at the Site by Farallon Consulting. Soil and reconnaissance groundwater samples were collected and analyzed for polychlorinated biphenyls (PCBs), metals, gasoline, diesel, benzene, toluene, ethylbenzene, and xylenes (BTEX), volatile organic compounds (VOCs), and polycylic aromatic hydrocarbons (PAHs).

Soil samples contained concentrations of gasoline (FB-2, FB-2A, and FB-2B), benzene (FB-2, FB-2A, and FB-2B), toluene (FB-2), xylenes (FB-2 and FB-2B), naphthalene (FB-5 and FB-5C), and the toxicity equivalent concentration of total carcinogenic PAHs (cPAHs) (FB-2A) above the MTCA Method A cleanup levels. Groundwater samples contained diesel and oil (FB-8 and FB-3), arsenic (FB-1), and total chromium (FB-2 and FB-1) at concentrations above the MTCA Method A cleanup levels. Generally, the gasoline, BTEX constituents, and cPAHs were detected in soil from the northwestern side of the Site, near the location of the former USTs.

## PAST REMEDIATION ACTIVITIES:

No remedial actions are documented to have occurred at the Site.

## CURRENT SITE CONDITIONS:

Gasoline, naphthalene, total cPAHs (toxicity equivalency), benzene, toluene, and xylenes were detected in soil samples collected from the northwestern section of the Site (approximately 5 feet bgs), at concentrations above the MTCA Method A cleanup levels. Groundwater samples collected from the southwestern side of the Site contained concentrations of oil and diesel above the MTCA Method A cleanup levels. Arsenic and chromium were also detected in groundwater above regulatory cleanup levels.

The approximate depth to groundwater is 8 feet below ground surface, with groundwater flowing to the west (estimated based on surface topography). Subsurface soils are silty sand and sandy silt (based on soil encountered in soil borings).

## SPECIAL CONSIDERATIONS:

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

☑ **Surface Water**

Impacted groundwater is expected to discharge to surface water. Additionally, a seep was documented to discharge to the LDW.

☑ **Air**

Release of volatile compounds occurred to subsurface soils. Naphthalene is not scored for the air route, as it was detected in Site soil, but not in Site groundwater. Ecology's draft vapor intrusion guidelines do not include screening levels for soils.

☑ **Groundwater**

Arsenic, chromium, diesel, and oil were detected in Site groundwater at concentrations above the MTCA Method A cleanup levels.

Even though the concentrations of mercury and zinc detected in the seep water were below the MTCA Method B cleanup level, the surface water route is scored for these analytes as the concentrations were above the marine chronic and/or acute water quality criteria. cPAHs are not expected to be available for transport.

# SITE HAZARD ASSESSMENT
# Worksheet 1
# Summary Score Sheet

## ROUTE SCORES:

| | | | |
|---|---|---|---|
| Surface Water/ Human Health: | 30.2 | Surface Water/ Environment: | 67.7 |
| Air/ Human Health: | 8.7 | Air/ Environment: | 1.5 |
| Groundwater/ Human Health: | 31.2 | | |

**Overall Rank: 2**

## REFERENCES:


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

2 Farallon Consulting, 2011, Subsurface Investigation Results Snopac Property 5055 East Marginal Way South Seattle, Washington. Prepared for Mr. John Heckel, Manson Construction Company. October 21, 2011.

3 Hart Crowser, 2011, Summary of Existing Information Report Former Snopac Products Inc. Site. Prepared for Washington State Department of Ecology. January 27, 2011.

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

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

6 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

7 Science Applications International Corporation, 2008, Lower Duwamish Waterway RM 0.9 to 1.0 East Slip 1 Summary of Existing Information and Identification of Data Gaps. Prepared for the Washington State Department of Ecology. August 2008.

8 WARM Scoring Manual

9 WARM Toxicological Database

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

11 Washington State Department of Ecology, 2014, Initial Investigation Field Report, ERTS Number: 646870. July 7, 2014.

12 Washington State Department of Health Source Water Assessment Maps. March 2011 update. https://fortress.wa.gov/doh/eh/dw/swap/maps/

13 Windward Environmental, 2004, Data Report: Survey and Sampling of Lower Duwamish Waterway Seeps. Prepared for the U.S. Environmental Protection Agency and the Washington State Department of Ecology. November 18, 2004.

# SITE HAZARD ASSESSMENT
# Worksheet 2
# Route Documentation

Cleanup Site ID: 12463 Snopac Property

Facility/Site ID: 1523145

## 1. SURFACE WATER ROUTE

**List those substances to be considered for scoring:**

Arsenic, chromium, mercury, zinc, diesel (oil not scored as toxicity data for oil is not available in the WARM manual)

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

Prior detection in Site groundwater or seep water 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 impacted groundwater to discharge to surface water; seep discharges to LDW

## 2. AIR ROUTE

**List those substances to be considered for scoring:**

Gasoline (benzene), toluene, xylenes

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

Prior detection in Site soil at concentrations above the MTCA Method A 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:**

Arsenic, chromium, diesel (oil not scored as toxicity data for oil is not available in the WARM manual)

**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 groundwater

**Worksheet 4**

**Surface Water Route**

**CSID:** 12463 **Site Name:** Snopac Property

**1.0 Substance Characteristics**

**1.1 Human Toxicity**

| Substance | Drinking Water Standard Value | Acute Toxicity Value | Chronic Toxicity Value | Carcinogenicity Value |
|---|---|---|---|---|
| Arsenic | 8 | 5 | 5 | 7 |
| Chromium | 6 | X | 1 | X |
| Mercury | 8 | X | 5 | X |
| Zinc | 2 | X | 1 | X |
| Diesel | 4 | 5 | 3 | X |
| | | | | |

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 |
| Arsenic | 69 | 6 | 763 | 5 |
| Chromium | 10300 | 2 | X | X |
| Mercury | 2.1 | 8 | X | X |
| Zinc | 95 | 6 | X | X |
| Diesel | 2350 | 2 | 490 | 5 |
| | | | | |

Environmental Toxicity Value 8

**1.3 Substance Quantity**

Amount: Approximately 5,000 square feet

Basis: Estimated extent of impacted soil

Substance Quantity Value 7

**2.0 Migration Potential**

**2.1 Containment** Containment Value 10

Explain Basis: Groundwater discharges to surface water

**2.2 Surface Soil Permeability** Soil Permeability Value 3

Silty sand and sandy 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 2

Site is in the 100 year floodplain

**2.6 Terrain Slope** Slope Value 2

Approximately 2 to 5% slope

**Worksheet 4**

**Surface Water Route**

**CSID:** 12463 **Site Name:** Snopac Property

**3.0 Targets**

| | | |
|---|---|---|
| **3.1 Distance to Surface Water** | Surface Water Distance Value | 10 |
| Site is adjacent to the Lower Duwamish Waterway | | |
| **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 | 12 |
| Site is adjacent to the Lower Duwamish Waterway | | |
| **3.5 Distance to and Name of Nearest Sensitive Environment** | Sensitive Environment Value | 12 |
| Site is adjacent to the Lower Duwamish Waterway | | |

| | | |
|---|---|---|
| **4.0 Release** | Release to Surface Water Value | 5 |
| Explain basis for scoring a release to surface water | | |
| Confirmed release of seep water to the Lower Duwamish Waterway | | |

**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 | $MIG_S$ | 13 |
| $REL_S$ = Release to Surface Water | $REL_S$ | 5 |
| $TAR_{SH}$ = Distance to Surface Water + Population Served by Surface Water + Area Irrigated | $TAR_{SH}$ | 10.0 |
| | $SW_H$ | 30.2 |

**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 | $SUB_{SE}$ | 128 |
| $MIG_S$ = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope | $MIG_S$ | 13 |
| $REL_S$ = Release to Surface Water | $REL_S$ | 5 |
| $TAR_{SE}$ = Distance to Surface Water + Distance to Fishery + Distance to Sensitive Environment | $TAR_{SE}$ | 34.0 |
| | $SW_E$ | 67.7 |

**Worksheet 5**

**Air Route**

**CSID:** 12463 **Site Name:** Snopac Property

**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 |
|---|---|---|---|---|
| Gasoline (benzene) | 10 | 3 | X | 5 |
| Toluene | 1 | X | 1 | X |
| Xylenes | 1 | 3 | 1 | 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 |
|---|---|---|---|---|
| Gasoline (benzene) | 31947 | 3 | 4 | 6 |
| Toluene | X | X | 4 | X |
| Xylenes | 21714 | 3 | 3 | 5 |
| | | | | |
| | | | | |
| | | | | |

Env. Final Matrix Value 6

**1.6 Substance Quantity**

Amount: Approximately 1,400 square feet

Basis: Estimated extent of petroleum-impacted soil

Substance Quantity Value 4

**Worksheet 5**

**Air Route**

**CSID:** 12463 **Site Name:** Snopac Property

**2.0 Migration Potential**

**2.1 Containment** Containment Value: 5

Explain Basis: At least 2 feet of soil cover and no vapor collection system present

**3.0 Targets**

**3.1 Nearest Population** Population Distance Value: 10

Less than 500 feet to nearby commercial establishments

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

Approximately 1,000 feet to Terminal 106 Park

**3.3 Population within 0.5 miles** Population Value: 6

31 population

**4.0 Release** Release to Air Value: 0

Explain basis for scoring a release to air:

No 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 | $SUB_{AH}$ | 178 |
| $REL_A$ = Release to Air | $REL_A$ | 0 |
| $TAR_{AH}$ = Nearest Population + Population within 1/2 mile | $TAR_{AH}$ | 15.6 |
| | $AIR_H$ | 8.7 |

**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 | $SUB_{AE}$ | 70 |
| $REL_A$ = Release to Air | $REL_A$ | 0 |
| $TAR_{AE}$ = Nearest Sensitive Environment | $TAR_{AE}$ | 7.0 |
| | $AIR_E$ | 1.5 |

**Worksheet 6**

**Groundwater Route**

**CSID:** 12463 **Site Name:** Snopac Property

**1.0 Substance Characteristics**

**1.1 Human Toxicity**

| Substance | Drinking Water Standard Value | Acute Toxicity Value | Chronic Toxicity Value | Carcinogenicity Value |
|---|---|---|---|---|
| Arsenic | 8 | 5 | 5 | 7 |
| Chromium | 6 | X | 1 | X |
| Diesel | 4 | 5 | 3 | X |
| | | | | |
| | | | | |
| | | | | |

Highest Value 8

Bonus Points? 0

Toxicity Value 8

**1.2 Mobility**

Cations/Anions Max Value: 3

Solubility Max Value:

Mobility Value 3

**1.3 Substance Quantity**

Amount: Approximately 400 cubic yards

Basis: Estimated volume of impacted soil

Substance Quantity Value 3

**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 sand and sandy silt

**2.4 Vertical Depth to Groundwater** 8 feet

Confirmed release: Yes

Depth to Aquifer Value 8

**3.0 Targets**

**3.1 Groundwater Usage**

Aquifer Use Value 3

Industrial and irrigation

**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:** 12463 **Site Name:** Snopac Property

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

1 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 | $SUB_{GH}$ | 157 |
| $MIG_G$=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 | $TAR_{GH}$ | 3.8 |
| | $GW_H$ | 31.2 |

## Washington Ranking Method

## Route Scores Summary and Ranking Calculation Sheet

**Site Name:** Snopac Property **CSID:** 12463

**Site Address:** 5055 East Marginal Way South **FSID:** 1523145

**HUMAN HEALTH ROUTE SCORES**

Enter Human Health Route Scores for all Applicable Routes:

| Pathway | Route Score | Quintile Group |
|---|---|---|
| Surface Water | 30.2 | 4 |
| Air | 8.7 | 2 |
| Groundwater | 31.2 | 2 |

H= 4
M= 2
L= 2

$$\frac{H^2 + 2M + L}{8} = \frac{16 + 4 + 2}{8}$$

**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 | 67.7 | 5 |
| Air | 1.5 | 1 |

H= 5
L= 1

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

**Environment Priority Bin Score:** **4**

rounded up to next whole number

**Comments/Notes:**

**FINAL MATRIX RANKING** **2**

**FOR REFERENCE:**

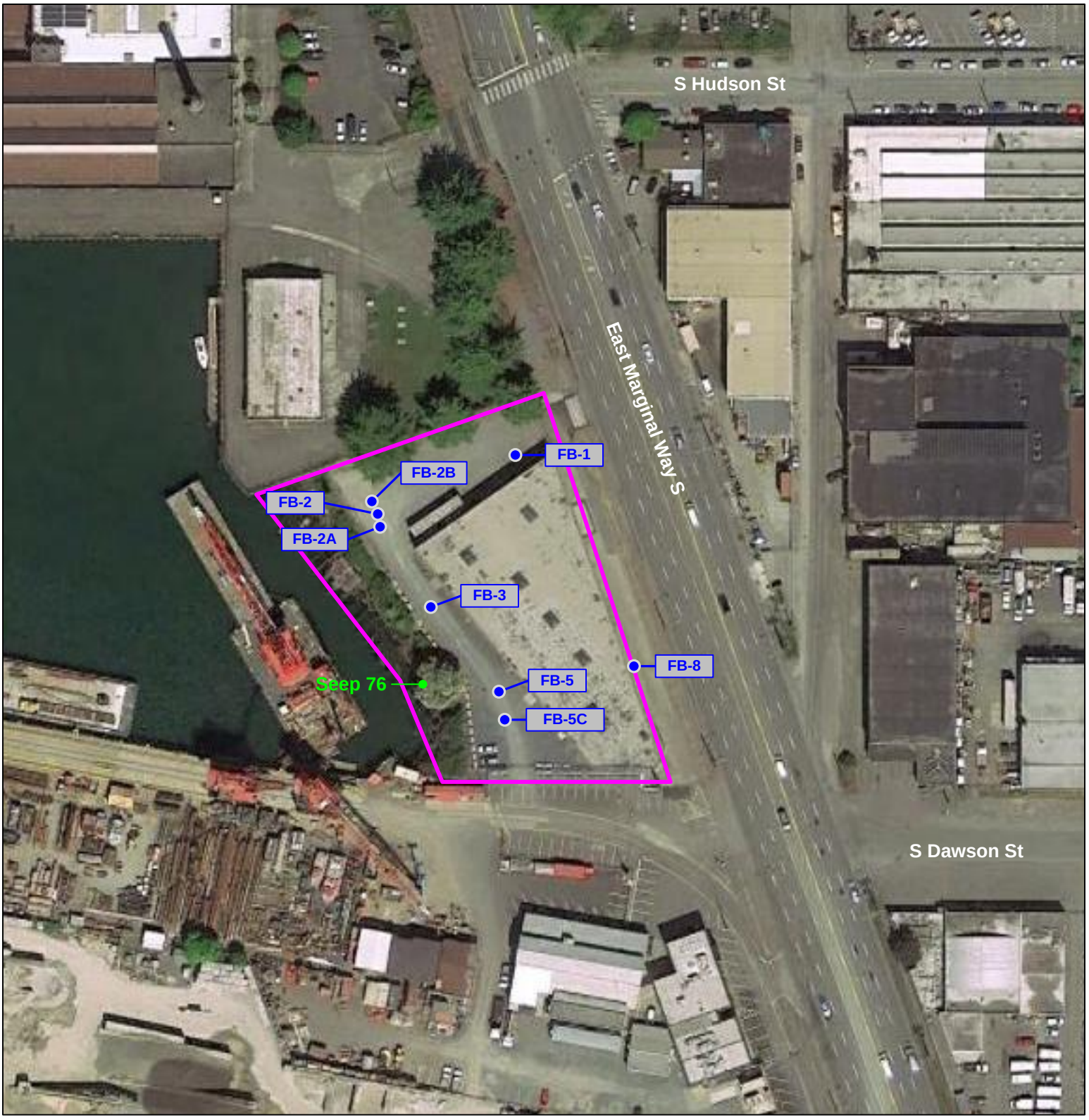
**Final WARM Bin Ranking Matrix**

| 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)
- Soil and/or groundwater sample location (approximate)
- Seep location (approximate)

Notes:

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

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**Snopac Property**
**5055 East Marginal Way South**
**Seattle, WA 98134**

DEPARTMENT OF ECOLOGY
State of Washington

## Site Overview Map

**CSID 12463**
CSID12463.vsd