SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

SITE INFORMATION:

Cleanup Site ID: 12485

King County Roads S Rose St HOT

Facility/Site ID: 23347

1239 S Rose St

Seattle, King County, WA 98108

Section:	32	Latitude:	47.52889
Township:	24N	Longitude:	-122.31542
Range:	4E	Tax/Parcel ID:	2185000895

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

SITE DESCRIPTION:

The King County Roads S Rose St HOT site (Site) is a former residence and boat storage area located in Seattle, King County, Washington. The 0.45-acre property is located adjacent to the Lower Duwamish Waterway (LDW), and zoned for regional business (RB) use.

Adjacent properties are primarily residential; however, mixed commercial properties are present to the west and south. The South Park Bridge and South Park Marina are located to the east, and the Lower Duwamish Waterway is located to the north. The South Park Marina site is listed in Ecology's Confirmed and Suspected Contaminated Sites (CSCSL) database with CSID 2858, and was listed on the Hazardous Sites List in February 2015 with a rank of 2. Other contaminated sites located near the Site include Port of Seattle T117 (CSID 1385, managed by EPA), Basin Oil Dallas Avenue (CSID 1844, listed on the Hazardous Sites List in February 2015 with a rank of 1), and Basin Oil Drum Storage (CSID 4789, unranked).

The Site is currently operated as a vacant lot by King County Department of Transportation Road Services Division.

The site was recently used by King County as a staging area in support of construction of the new South Park Bridge over the LDW, but is currently vacant (bridge construction is completed). Previous residential structures were demolished when King Countly acquired the property in 2010.

The Site has a Seattle mailing address but is located in unincorporated King County between Seattle and Tukwila.

SITE BACKGROUND:

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

From	To	Operator/Tenant	Activity
1938	1993	Willard Crow and Marie Rose	Residence
1993	2010	South Park Marina	Boat Storage
2010	2015	King County	Vacant; used for South Park Bridge construction support

SITE CONTAMINATION:

In 2010 the King County Roads S Rose St HOT site was reported to Washington State Department of Ecology (Ecology) and placed on the CSCSL list with ID number 12485.

One 300-gallon heating oil underground storage tank (UST) was removed from the Site in September 2010 (Note: 'HOT' in the site name is an acronym for 'heating oil tank'). The UST was discovered during site preparation (i.e., demolition of existing structures and grading) performed by King County to support construction of the new South Park Bridge over the LDW.

Impacts to soil were confirmed by analytical results for soil samples collected at the time of UST removal. Diesel-range total petroleum hydrocarbon (TPH) concentrations above the MTCA Method A cleanup level were identified

beneath the former UST location. The highest detected concentration was 19,000 milligrams per kilogram (mg/kg) in a sample collected from beneath the UST [(SPBUST1-B2(10)] at approximately 10 feet below ground surface (bgs). This soil was overexcavated and removed from the Site. The initial UST excavation was terminated at approximately 10 feet bgs based on the presence of groundwater.

A subsurface investigation of the former UST area was conducted by Shannon & Wilson in November 2010 and included collection and laboratory analysis of soil and reconnaissance groundwater samples from eight soil borings. Diesel-range TPH was identified in soil samples collected from two borings at concentrations above the MTCA Method A soil cleanup level. The highest detected diesel concentration was 41,000 mg/kg. Soil samples with diesel concentrations above the MTCA Method A cleanup level were collected from borings located to the north (N3-10-9) and west (W2-7.5-6.5) of the former UST location. Soil in these areas was excavated.

Diesel-range TPH was detected at concentrations above the laboratory reporting limits in four of the eight groundwater samples collected by Shannon & Wilson in 2010. Two of the groundwater samples (W2-7.5-GW and N3-10-GW) contained diesel-range TPH at concentrations above the MTCA Method A groundwater cleanup level, with a maximum concentration of 6,940 micrograms per liter (ug/l). Oil-range TPH was also detected in one groundwater sample (W2-7.5-GW) at 1,760 ug/l, above the MTCA Method A groundwater cleanup level. Groundwater samples with TPH concentrations above the MTCA cleanup level were collected from borings located to the north and west of the former UST location.

The 2010 Shannon & Wilson investigation report identifies the locations and analytical results for four previous soil borings that were installed during a Phase II investigation performed by Hererra Environmental Consultants in 2009; however, the report from the Herrera investigation was not available for review. Herrera reportedly collected soil samples from four borings, and a groundwater sample from one, for analysis of diesel- and oil-range TPH. Diesel- and oil-range TPH were reportedly not detected at concentrations above laboratory reporting limits for the 2009 Hererra samples.

PAST REMEDIATION ACTIVITIES:

Approximately 300 tons of soil were excavated from the vicinity of the former heating oil UST in March 2011 and disposed offsite.

Soil samples collected from the remedial excavation did not contain diesel- or oil-range TPH concentrations above the laboratory reporting limits, except at one location. A sample collected from the excavation floor [SPBREM-B(14) collected at 14 feet bgs] north-northeast of the former UST location contained diesel-range TPH at a concentration of 410 mg/kg, below the MTCA Method A soil cleanup level. This soil was not removed from the excavation, which was terminated at 14 feet bgs.

Groundwater samples were not collected during the remedial excavation, but the June 2011 Remedial Excavation Report indicates that a smear zone was observed during excavation activities, primarily between 8 and 12 feet bgs, possibly extending below the 14-foot base of the remedial excavation. The smear zone appears to be a result of tidally-influenced groundwater fluctuations that occur at the Site based on its proximity to the LDW. The June 2011 Remedial Excavation Report suggests that groundwater levels at the Site may fluctuate from approximately 8 feet bgs up to16 feet bgs based on the LDW tidal stage, but this has not been confirmed. The report notes that impacted soil was not observed above approximately 8 feet bgs.

CURRENT SITE CONDITIONS:

The site is currently vacant (not continuously occupied) but was recently used for support of the new South Park Bridge construction. Soil affected by the release of heating oil from the UST was removed from the site and soil sample results were all below MTCA Method A cleanup levels. However, some residual heating oil impacts were detected north-northeast of the former UST location (410 mg/kg diesel-range TPH) in soil that is in contact with groundwater. Groundwater sampling has not been performed (either from the excavation, borings, or wells) since the remedial soil removal action in 2011.

Contaminants associated with the Site include diesel- and oil- range TPH.

The approximate depth to groundwater is 8 to greater than 12 (based on reported field observations) feet below ground surface, with groundwater flowing to the north, generally toward the LDW. Subsurface soils are primarily sand and silty sand.

SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

SPECIAL CONSIDERATIONS:

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

☑ **Surface Water**

Potential for transport of contaminants to the LDW based on soil and groundwater analytical results.

☐ **Air**

The air route was not scored because the only confirmed contaminants were diesel- and oil-range TPH.

☑ **Groundwater**

Diesel- and oil-range TPH concentrations >MTCA clenaup levels in samples.

ROUTE SCORES:

Surface Water/ Human Health:	15.1	Surface Water/ Environment:	27.7
Air/ Human Health:		Air/ Environment:	
Groundwater/ Human Health:	20.7		

Overall Rank: 4

REFERENCES:

1 Ecology Water Resources Explorer, accessed May 2015. https://fortress.wa.gov/ecy/waterresources/map/WaterResourcesExplorer.aspx

2 King County Department of Transportation, 2010, Home Heating Oil Tank Removal, 1239 South Rose Street, Memorandum dated October 11th, 2010.

3 King County Department of Transportation, 2011, Interim Data Report - Remedial Excavation, 1239 South Rose Street, report dated June 2011.

4 King County GIS Center iMAP application, Property Information, Groundwater Program, and Sensitive Areas mapsets. Accessed May 2015. 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 May 2015.

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 Shannon & Wilson, 2011, GeoProbe Investigation, 1239 Rose Street, South Park Bridge, January 25th, 2011.

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, 2011, Initial Investigation Field Report, ERTS Number 622353, Donna Musa and Brad Gilmore, April 12th, 2011.

SITE HAZARD ASSESSMENT
Worksheet 2
Route Documentation

Cleanup Site ID: 12485 King County Roads S Rose St HOT

Facility/Site ID: 23347

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

Diesel (oil not scored as toxicity data for oil is not available in WARM)

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

Potential transport of contaminants to surface water in the LDW based on soil and groundwater analytical results

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 surface water in the LDW

2. AIR ROUTE

List those substances to be considered for scoring:

Not applicable

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

List those management units to be considered for scoring:

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

3. GROUNDWATER ROUTE

List those substances to be considered for scoring:

Diesel (oil not scored as toxicity data for oil is not available in WARM)

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

Release to groundwater based on analytical results

List those management units to be considered for scoring:

Groundwater

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

Presence in groundwater at concentrations above MTCA Method A groundwater cleanup levels for samples collected in 2010

Worksheet 4

Surface Water Route

CSID: 12485 **Site Name:** King County Roads S Rose St HOT

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

Highest Value	5
Bonus Points?	0
Human Health Toxicity Value	5

1.2 Environmental Toxicity

Substance	Acute Water Quality Criteria ug/L	Value	Non-human Mammalian Acute Toxicity mg/kg	Value
Diesel	2350	2	490	5

Environmental Toxicity Value	2

1.3 Substance Quantity

Amount: 300 gallons

Basis: Former UST Capacity

Substance Quantity Value	2

2.0 Migration Potential

2.1 Containment Containment Value: 10

Explain Basis: Migration/discharge of groundwater contaminants to LDW surface water

2.2 Surface Soil Permeability Soil Permeability Value: 3

Sand and silty sand; medium permeability

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

In 100-year floodplain

2.6 Terrain Slope Slope Value: 3

5% to 8%

Worksheet 4

Surface Water Route

CSID: 12485 **Site Name:** King County Roads S Rose St HOT

3.0 Targets

3.1 Distance to Surface Water Surface Water Distance Value: 10

Site is adjacent to LDW; approximately 75 feet from former UST area to LDW

3.2 Population Served within 2 miles Population Value: 0

0 people

3.3 Area Irrigated within 2 miles Irrigation Value: 2

5 acres King County Parks LDW water right; approximate

3.4 Distance to Nearest Fishery Resource Fishery Value: 12

Site is adjacent to the LDW

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

Site is adjacent to the LDW

4.0 Release Release to Surface Water Value: 0

Explain basis for scoring a release to surface water

Potential release to surface water not confirmed

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}	90
MIG_S = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope	MIG_S	14
REL_S = Release to Surface Water	REL_S	0
TAR_{SH} = Distance to Surface Water + Population Served by Surface Water + Area Irrigated	TAR_{SH}	11.7
	SW_H	15.1

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}	57
MIG_S = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope	MIG_S	14
REL_S = Release to Surface Water	REL_S	0
TAR_{SE} = Distance to Surface Water + Distance to Fishery + Distance to Sensitive Environment	TAR_{SE}	34.0
	SW_E	27.7

Worksheet 6

Groundwater Route

CSID: 12485 **Site Name:** King County Roads S Rose St HOT

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

Highest Value 5

Bonus Points? 0

Toxicity Value 5

1.2 Mobility

Cations/Anions Max Value:

Solubility Max Value: 1 Mobility Value 1

1.3 Substance Quantity

Amount: 300 gallons

Basis: Former UST capacity

Substance Quantity Value 2

2.0 Migration Potential

2.1 Containment Containment Value 10

Explain Basis: Release to subsurface from UST

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

2.3 Subsurface Hydraulic Conductivity Conductivity Value 3

primarily sand and 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 4

Private supply, but alternate sources available with minimum hookup requirements

3.2 Distance to Nearest Drinking Water Well 7000 feet

Well Distance Value 1

3.3 Population Served within 2 Miles Population Served Value 3

9 people

Worksheet 6

Groundwater Route

CSID: 12485 **Site Name:** King County Roads S Rose St HOT

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:

Release to groundwater confirmed by analytical results

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}	101
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}	8.0
	GW_H	20.7

Washington Ranking Method

Route Scores Summary and Ranking Calculation Sheet

Site Name: King County Roads S Rose St HOT **CSID:** 12485

Site Address: 1239 S Rose St, Seattle, WA 98108 **FSID:** 23347

HUMAN HEALTH ROUTE SCORES

Enter Human Health Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	15.1	3
Air	not scored	0
Groundwater	20.7	1

H=	3
M=	1
L=	0

$$\frac{H^2 + 2M + L}{8} = \frac{9 + 2 + 0}{8}$$

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	27.7	3
Air	not scored	0

H=	3
L=	0

$$\frac{H^2 + 2L}{7} = \frac{9 + 0}{7}$$

Environment Priority Bin Score: **2**

rounded up to next whole number

Comments/Notes:

FINAL MATRIX RANKING **4**

FOR REFERENCE:

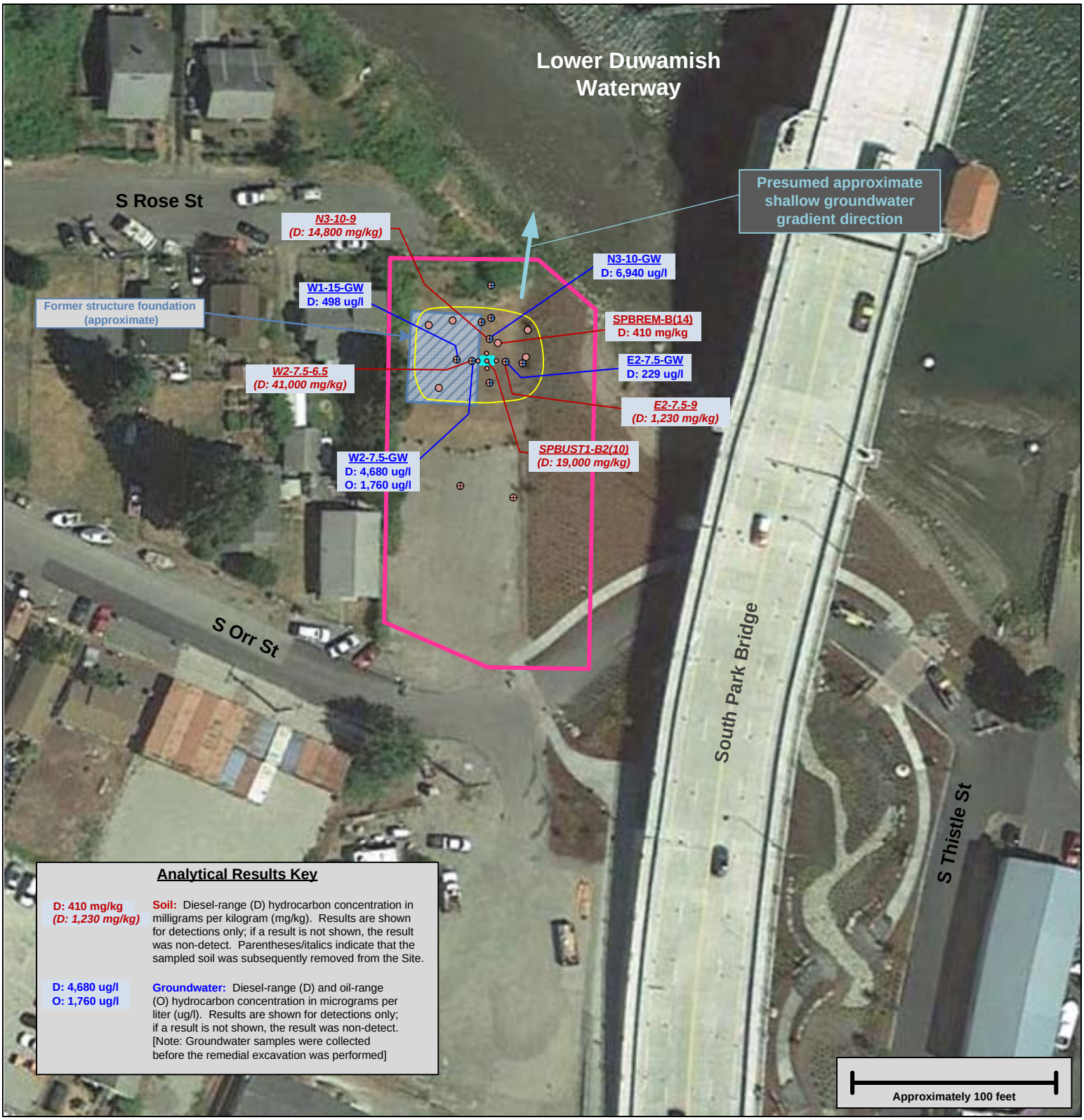
Final WARM Bin Ranking Matrix

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 - February 2015 Values

Quintile	Human Health Surface Water	Air	Ground Water	Environment Surface Water	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



Analytical Results Key

D: 410 mg/kg *(D: 1,230 mg/kg)*	**Soil:** Diesel-range (D) hydrocarbon concentration in milligrams per kilogram (mg/kg). Results are shown for detections only; if a result is not shown, the result was non-detect. Parentheses/italics indicate that the sampled soil was subsequently removed from the Site.
D: 4,680 ug/l O: 1,760 ug/l	**Groundwater:** Diesel-range (D) and oil-range (O) hydrocarbon concentration in micrograms per liter (ug/l). Results are shown for detections only; if a result is not shown, the result was non-detect. [Note: Groundwater samples were collected before the remedial excavation was performed]

Legend:

- Property location (approximate)
- Approximate former heating oil UST location
- Approximate remedial soil excavation area
- Excavation soil sample location (approximate) for initial site assessment (small circles) and remedial excavation (larger circles)
- Soil boring with soil and groundwater samples (approximate)
- Soil boring with soil samples only (approximate)

N

Notes:

1. All locations are approximate. Scale is approximate.

King County Roads S Rose St HOT
1239 S Rose St
Seattle, WA 98108

DEPARTMENT OF ECOLOGY
State of Washington

Site Overview Map

CSID 12485

CSID12485.vsd