

SITE HAZARD ASSESSMENT

Worksheet 1

Summary Score Sheet

SITE INFORMATION:

Boeing Field Chevron

10805 Tukwila International Boulevard

Tukwila, King County, WA 98168

Cleanup Site ID: 7030

Facility/Site ID: 2551

Section:	3	Latitude:	47.50610
Township:	23N	Longitude:	-122.29130
Range:	4E	Tax/Parcel ID:	0323049064

*Site Scored/ranked for the August 2014 Hazardous Sites List Publication***SITE DESCRIPTION:**

The Boeing Field Chevron site (Site) is a former Chevron (now privately owned) gas and service station located in Tukwila, King County, Washington. The 0.61-acre property is located approximately 350 feet from Duwamish River, and zoned for manufacturing/industrial (MIC/H) use.

Adjacent properties include World of Truth International Ministry/Alber Seafood to the south and Simmco further to the south. Secret Garden Statuary and a Tool & Equipment rental company are located to the west, across Tukwila International Blvd, beyond which is the Duwamish River. Blue Star Gas and Paramount Supply Company are located to the east across East Marginal Way S.

The Site is currently operated as a Chevron station and convenience store by Rajbir and Pradeep Sandhu.

The current gas station/convenience store/car wash facility was constructed in 1996. A drive-through car wash is also present at the property. The site has historically been operated as a gas station - a 1940 aerial photograph shows a gas station at the site, and Standard Oil and Chevron were listed in Polk City Directories from approximately 1969 through 1982. Aerial photographs show the site was vacant between at least 1990 and 1995, prior to development of the current station.

The site is located on a triangular-shaped parcel south of the intersections of S. Boeing Access Road, Tukwila International Blvd, and E Marginal Way S. The eastern side of the property is bound by E Marginal Way S, and Tukwila International Blvd is located along the western property line.

SITE BACKGROUND:

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

<u>From</u>	<u>To</u>	<u>Operator/Tenant</u>	<u>Activity</u>
	1990	Chevron	Gasoline and service station
1995	2013	Chevron (Sandhu)	Gas station and convenience store

SITE CONTAMINATION:

In 1990 the Boeing Field Chevron site was reported to Washington State Department of Ecology (Ecology) and placed on the Leaking Underground Storage Tank (LUST) list with ID number 1258.

The site was initially reported as a LUST site in 1990 following removal of eight underground storage tanks (USTs) and identification of petroleum impacted soils and groundwater. Impacted soils were addressed by independent remedial action, with ongoing groundwater monitoring. A second release was reported in 1997 as LUST site 4469 after an undocumented UST was encountered in July 1996 during excavation at the site. A third release was reported to Ecology in May 2003 when free phase hydrocarbons were encountered during routine groundwater monitoring. Groundwater is observed to be present at approximately 9 to 10 feet below ground surface (bgs), however two hydrogeologic units (upper unconfined/perched and lower semi-confined) are reportedly present at the site. Primary contaminants of concern identified include gasoline and diesel range

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hydrocarbons, and benzene.

Multiple site investigations have taken place at the site, associated with each of the three reported releases.

In 1990, several site assessments were conducted by Geotech Consultants and Rittenhouse-Zeman & Associates, identifying hydrocarbon impacts to soils near the former western pump island and the former underground storage tanks. Soils were excavated, and excavation sidewalls were sampled in both of these areas following removal of the tanks and pumps. Seven groundwater monitoring wells (MW-1 through MW-7) were installed and sampled in 1990, and benzene, ethylbenzene and xylene impacts to groundwater above the proposed Model Toxics Control Act (MTCA) cleanup levels (at that time) were observed in well MW-2. Additional groundwater monitoring was conducted at MW-2 and MW-6, and further soil excavation was conducted near the eastern pump island and beneath the former service station building. Hydrocarbon odors were identified in soils beneath the northeastern portion of the eastern pump island, and hydrocarbon staining was observed in soils south of the former service station building location. A sump was identified at the former service station that appeared to contain hydrocarbons in fill material.

Eleven test pits were dug in August 1990 around the property to assess the extent of hydrocarbon impacts. Several areas were identified for further soil excavation and disposal, and during excavation activities monitoring well MW-2 was damaged and abandoned.

PAST REMEDIATION ACTIVITIES:

In September 1992, two 550-gallon USTs containing waste oil and diesel oil were decommissioned at the site. Soils were sampled from the sidewalls and base of each tank excavation, and sampling results indicated diesel range hydrocarbons in soil were below MTCA Method A cleanup levels at the diesel oil tank location, and benzene, toluene, ethylbenzene, xylenes (BTEX), gasoline, diesel, and lead concentrations in soil at the used oil tank excavation were below MTCA Method A soil cleanup levels. During excavation activities, monitoring wells MW-3, MW-4 and MW-5 were abandoned.

Wells MW-2R, MW-3R, and MW-4R were installed to replace previously abandoned wells, and new monitoring wells MW-8 and MW-9 were installed in the southern portion of the site. Perched groundwater was identified during drilling activities at MW-8 and MW-9, thus additional wells MW-8A and MW-9A were installed to monitor perched (shallow) groundwater present. An organic-rich confining layer was identified at a depth of approximately 10 feet bgs at the south end of the site, hydraulically separating perched groundwater from the underlying, partially-confined, tidally-influenced alluvial unit.

In July 1996, during site excavation and construction activities, an undocumented UST (approximately 280-gallon capacity) was encountered, resulting in the release of free-phase hydrocarbons (presumed to be heating oil or used oil) to a storm drain and catch basin. 785 gallons of liquid were recovered from the catch basin by vacuum truck. The undocumented UST was decommissioned and removed approximately one week later, and three soil samples were collected from the tank excavation. Analytical results indicated soils with concentrations of diesel and oil range hydrocarbons above MTCA Method A cleanup levels were present at the base and sides of the UST excavation, and a sidewall soil sample also contained gasoline range hydrocarbons at a concentration above the MTCA Method A cleanup level. Prior to, or during, the 1996 construction activities, the remaining groundwater monitoring wells were abandoned at the site. Additional investigation activities were conducted in September 1997, including the installation of three groundwater monitoring wells (MW-10 through MW-12) screened across both saturated zones, as well as soil and groundwater sampling.

Groundwater monitoring and sampling activities continued on a regular basis, performed by consultants to Chevron. Oxygen Release Compound (ORC) was used on one or more occasions between May 1999 and September 2001 in wells MW-10 through MW-12. Groundwater monitoring and sampling results from November 2002 indicated concentrations of diesel, gasoline, benzene, and/or methyl-tert butyl ether (MTBE) above the corresponding MTCA Method A cleanup levels were present in one or more of the groundwater samples collected from the three monitoring wells (MW-10, MW-11 & MW-12) being monitored.

In May 2003, SAIC identified a new hydrocarbon release at the site during routine groundwater monitoring and sampling activities, and reported this third release to Ecology. Subsequent field investigation and site assessment activities were conducted under the direction of the current property owner, Rajbir Sandhu and his consultants, Environmental Resolutions, Inc. and later, G-Logics. In February 2004, ten geoprobe soil borings

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were advanced and sampled to characterize soil and groundwater conditions. Analytical results for soil samples from three borings near the western property line contained concentrations of gasoline and/or benzene exceeding the respective MTCA Method A cleanup levels. Groundwater samples collected from four borings near the western property line contained gasoline and/or benzene concentrations exceeding the respective MTCA Method A cleanup levels.

In July 2004, two additional groundwater monitoring wells, MW-13 and MW-14, were installed and soil samples were collected. Analytical results from soil sampling identified concentrations of gasoline range hydrocarbons and benzene exceeding MTCA Method A cleanup levels at a depth of 10 feet in boring B2 (MW-14). In August 2004, groundwater samples were collected at wells MW-10 through MW-14. Concentrations of gasoline and/or benzene were reported above the MTCA Method A cleanup levels for groundwater sampled at MW-10, MW-11, MW-13 and MW-14. The third release was reportedly believed to be a gasoline release that occurred between November 2002 and May 2003 in the western pump island area. Reportedly, in January 2004, the west pump island was closed, the line repaired, and approximately 195 tons of petroleum-impacted soil was excavated from the pump island area. Some remaining petroleum-impacted soils were left in place near the sidewalk along the western property boundary, and are suspected to be present beneath the Tukwila International Boulevard right-of-way. (Note: Tukwila International Boulevard is also known as Pacific Highway South)

Additional drilling and sampling was conducted in March 2005 in the median of Tukwila International Boulevard, west of the site. One geoprobe boring (B-11) was advanced to 14 feet bgs, and soil was sampled at a depth of 10 feet and analyzed for volatile organic compounds (VOCs). A groundwater grab sample was collected at approximately 13 feet bgs and analyzed for gasoline, diesel and oil range hydrocarbons, as well as BTEX constituents. Petroleum hydrocarbon concentrations were not detected in the soil sample at B-11 above method reporting limits, however the groundwater sample contained diesel range hydrocarbons at a concentration of 500 parts per billion (ppb), equal to the current (as of January 2014) MTCA Method A cleanup level.

Further site characterization was conducted in 2005 during drilling, soil sampling, and monitoring well installation (MW-15 through MW-17) activities along the western property boundary and in the adjacent right-of-way. Soil samples collected during drilling activities were analyzed for diesel, gasoline, and oil range hydrocarbons and BTEX constituents. Benzene and/or gasoline concentrations exceeding MTCA Method A cleanup levels were reported in soil samples collected at B1 (MW-15) at depths of 10 and 15 feet bgs. Benzene concentrations exceeding MTCA Method A cleanup levels were also reported in soil samples from depths of 20 and 25 feet bgs at boring B12 (MW-17). Free-phase hydrocarbons were identified and recovered from wells MW-14 and MW-15 in late 2005 by periodically bailing wells. In December 2005, Ecology requested free-phase hydrocarbon recovery be performed. An enhanced fluid recovery pilot test conducted in January 2006 demonstrated very little recovery of free-phase gasoline.

Following a March 3, 2006 meeting with Ecology regarding free-project removal and remediation of gasoline-impacted groundwater at the site, G-Logics prepared a workplan proposing In Situ Chemical Oxidation (ISCO) treatment of groundwater with peroxide and soil vapor extraction. The free product thickness at MW-15 ranged from less than 1 foot to just over 3 feet, and six groundwater treatments injecting Fenton's Reagent were conducted between May 2006 and February 2007. Several injection points were installed at the site. The measurable thickness of free-phase hydrocarbons was reduced during, and immediately following Fenton's Reagent treatments, however product thicknesses were observed to increase in the period between October 2007 and February 2008. Absorbent socks were then used for product recovery, prior to the installation of a proposed automated skimmer recovery system. The free product thickness at MW-15 remained less than 0.25 feet thick during the course of Fenton's Reagent treatments, and ranged up to 1.44 feet thick until absorbents were used in the well beginning in approximately February 2008.

In March 2008, nine hollow-stem auger borings were advanced and completed as groundwater monitoring/soil vapor extraction wells (EW-1 through EW-9). Most of the soil samples analyzed contained concentrations of benzene exceeding MTCA Method A cleanup levels. Analytical results from groundwater sampling at the new monitoring/extraction wells indicated that both the perched and semi-confined groundwater units contained concentrations of gasoline and/or BTEX constituents above MTCA Method A cleanup levels. The deeper, semi-confined groundwater unit is reportedly impacted by higher concentrations with a larger lateral footprint than the perched groundwater.

In April 2008, four geoprobe borings were advanced offsite on the west side of Tukwila International Boulevard and completed as monitoring wells MW-18 through MW-21 to evaluate soil and groundwater conditions

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hydraulically downgradient of the site. Soil and groundwater samples were analyzed for BTEX and gasoline-range petroleum hydrocarbons, and reportedly all results were below laboratory detection limits. Monitoring well MW-18 was constructed in the upper, perched groundwater zone, while wells MW-19, MW-20 and MW-21 were constructed in the lower, semi-confined zone.

An automated free-product recovery system was installed in May 2008, and began operating later that month. Six skimmer pumps were installed in wells where free-phase hydrocarbons were measured or observed and the product recovery system was monitored regularly by on-site personnel. The system was taken off-line for a period during late December 2008 and early 2009 when freezing temperatures caused concerns about equipment operations. Periodic adjustments have been made to the skimmer configurations, moving skimmers to different wells, and adjusting the vertical installation as groundwater conditions fluctuated seasonally. The skimmer system operated until May 2010, when product recovery rates became negligible. After May 2010, absorbent socks were installed in wells with observed free-phase gasoline, and replaced every 1 to 2 weeks. Product recovery with absorbent socks was ongoing, as of the most recent update report, dated April 2, 2012.

CURRENT SITE CONDITIONS:

A number of data gaps regarding current site conditions have been identified, including: 1) thickness/presence of free-phase hydrocarbons in groundwater, 3) lateral extent of perched groundwater impacts versus the extent of semi-confined groundwater impacts, 4) lateral and vertical extents of remaining soils impacted above MTCA Method A cleanup level, 5) soil and groundwater conditions in the utility corridor between the free-product recovery system and Tukwila International Boulevard. The operational and performance status of the free-product recovery system since 2008 is not known.

Soil and groundwater contamination by gasoline, diesel and benzene has been documented at the site, near the western property line.

The approximate depth to groundwater is 10 to 13 feet below ground surface, with groundwater flowing to the west (based on prior monitoring observations). Subsurface soils are silts and sands (as observed on lithologic boring logs).

SPECIAL CONSIDERATIONS:

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

Surface Water

Duwamish River is located approximately 350 feet downgradient of the 2003 release area.

Air

Potential vapor intrusion, however no inhabited structures are present directly above the release area. The site is paved.

Groundwater

Confirmed impacts to groundwater exceeding MTCA Method A cleanup levels, ongoing free product recovery in 2003 gasoline release area.

Free-product recovery activities have been ongoing since May 2008 at the site. No groundwater sampling reports have been received since that time.

ROUTE SCORES:

Surface Water/ Human Health:	21.4	Surface Water/ Environment:	38.4
Air/ Human Health:	13.1	Air/ Environment:	1.3
Groundwater/ Human Health:	35.1		

Overall Rank: 3

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- 20 WARM Scoring Manual
- 21 WARM Toxicological Database

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SITE HAZARD ASSESSMENT

Worksheet 2

Route Documentation

Cleanup Site ID: 7030

Boeing Field Chevron

Facility/Site ID: 2551

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

Gasoline, diesel and benzene

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

All substances present in groundwater at concentrations above MTCA Method A cleanup level. The toxicity of gasoline is based on that of benzene.

List those management units to be considered for scoring:

Groundwater discharge to Duwamish River

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

Lower semi-confined groundwater at the site is hydraulically connected to the Duwamish River

2. AIR ROUTE

List those substances to be considered for scoring:

Gasoline and benzene

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

Volatile compounds present in soil and groundwater, available for vapor transport. The toxicity of gasoline is based on that of benzene.

List those management units to be considered for scoring:

Soil vapor

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

Possible vapor intrusion to indoor or ambient air. The site is paved.

3. GROUNDWATER ROUTE

List those substances to be considered for scoring:

Gasoline, benzene and diesel

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

All substances are present in groundwater at concentrations exceeding MTCA Method A cleanup levels. The toxicity of gasoline is based on that of benzene.

List those management units to be considered for scoring:

Shallow perched groundwater and lower semi-confined groundwater units

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

Both groundwater units at the site are impacted above MTCA Method A cleanup levels

Worksheet 4
Surface Water Route

CSID: 7030

Site Name: Boeing Field Chevron

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
TPH - gasoline/benzene	8	3	X	5
TPH - diesel	6	5	3	X

Highest Value 8

Bonus Points? 2

Human Health Toxicity Value

1.2 Environmental Toxicity

Substance	Acute Water Quality Criteria		Non-human Mammalian Acute Toxicity	
	ug/L	Value	mg/kg	Value
TPH - gasoline/benzene	5300	2	3306	2
TPH - diesel	2300	2	490	4

Environmental Toxicity Value

1.3 Substance Quantity

Amount: Approximately 1,000 square feet of impacted soils/smear zone

Basis: Estimated areal extent of contaminated, saturated soils near western property line & utility corridor

Substance Quantity Value

2.0 Migration Potential

2.1 Containment

Containment Value

Explain Basis: Release to subsurface soils and groundwater, groundwater discharges to surface water

2.2 Surface Soil Permeability

Soil Permeability Value

silt/sand mixtures

2.3 Total Annual Precipitation

Total Precipitation Value

37 inches

2.4 Max 2-yr/24-hour Precipitation

2YR/24HR Precipitation Value

2.4 inches

2.5 Floodplain

Floodplain Value

Not in floodplain

2.6 Terrain Slope

Slope Value

6% grade & culverted/piped outfalls to Duwamish River

Worksheet 4
Surface Water Route

CSID: 7030

Site Name: Boeing Field Chevron

3.0 Targets

3.1 Distance to Surface Water

Approximately 350' from 2002/2003 release area

Surface Water Distance Value

3.2 Population Served within 2 miles

people

Population Value

3.3 Area Irrigated within 2 miles

acres

Irrigation Value

3.4 Distance to Nearest Fishery Resource

Duwamish River - approximately 350 feet away

Fishery Value

3.5 Distance to and Name of Nearest Sensitive Environment

Duwamish River - approximately 350 feet away

Sensitive Environment Value

4.0 Release

Explain basis for scoring a release to surface water

Discharge to surface water not confirmed, but is suspected

Release to Surface Water Value

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:

$$SUB_{SH} = (\text{Human Toxicity Value} + 3) * (\text{Containment} + 1) + \text{Substance Quantity}$$

$$MIG_S = \text{Soil Permeability} + \text{Annual Precip} + \text{Rainfall Frequency} + \text{Floodplain} + \text{Slope}$$

$$REL_S = \text{Release to Surface Water}$$

$$TAR_{SH} = \text{Distance to Surface Water} + \text{Population Served by Surface Water} + \text{Area Irrigated}$$

SUB _{SH}	149
MIG _S	12
REL _S	0
TAR _{SH}	10
SW_H	21.4

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:

$$SUB_{SE} = (\text{Env Tox Value} + 3) * (\text{Containment} + 1) + \text{Substance Qty}$$

$$MIG_S = \text{Soil Permeability} + \text{Annual Precip} + \text{Rainfall Frequency} + \text{Floodplain} + \text{Slope}$$

$$REL_S = \text{Release to Surface Water}$$

$$TAR_{SE} = \text{Distance to Surface Water} + \text{Distance to Fishery} + \text{Distance to Sensitive Environment}$$

SUB _{SE}	83
MIG _S	12
REL _S	0
TAR _{SE}	34
SW_E	38.4

Worksheet 5

Air Route

CSID: 7030

Site Name: Boeing Field Chevron

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
TPH - gasoline/benzene	10	3	ND	5

Highest Value 10

Bonus Points? 0

Toxicity Value

1.3 Mobility

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

Mobility Value

1.4 Final Human Health Toxicity/Mobility Matrix Value

HH Final Matrix Value

1.5 Environmental Toxicity/Mobility

Substance	Non-human Mammalian Inhalation Toxicity (mg/m3)	Acute Value	Mobility Value	Table A-7 Matrix Value
TPH - gasoline/benzene	31947	3	4	6

Env. Final Matrix Value

1.6 Substance Quantity

Amount: Approximately 1,000-2,500 square feet

Basis: Estimated areal extent of impacted soil & groundwater

Substance Quantity Value

Worksheet 5

Air Route

CSID: 7030

Site Name: Boeing Field Chevron

2.0 Migration Potential

2.1 Containment

Containment Value

Explain Basis: Subsurface release with at least 2 feet soil cover, no active vapor recovery/
treatment system

3.0 Targets

3.1 Nearest Population

Population Distance Value

Convenience store less than 100 feet away

3.2 Distance to and name of nearest sensitive environments

Sensitive Environment Value

Approximately 1200 feet to Site 1 Duwamish Park (S 112th Street & Duwamish River)

3.3 Population within 0.5 miles

Population Value

293 population

4.0 Release

Release to Air Value

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:

$$SUB_{AH} = (\text{Human toxicity} + 5) * (\text{Containment} + 1) + \text{Substance Qty}$$

$$REL_A = \text{Release to Air}$$

$$TAR_{AH} = \text{Nearest Population} + \text{Population within 1/2 mile}$$

SUB _{AH}	154
REL _A	0
TAR _{AH}	27
AIR_H	13.1

Pathway Scoring - Air Route, Environmental Pathway

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

Where:

$$SUB_{AE} = (\text{Environmental Toxicity Value} + 5) * (\text{Containment} + 1) + \text{Substance Qty}$$

$$REL_A = \text{Release to Air}$$

$$TAR_{AE} = \text{Nearest Sensitive Environment}$$

SUB _{AE}	70
REL _A	0
TAR _{AE}	6
AIR_E	1.3

Worksheet 6
Groundwater Route

CSID: 7030

Site Name: Boeing Field Chevron

3.4 Area Irrigated by GW Wells within 2 miles

Area Irrigated Value

0 acres

4.0 Release

Release to Groundwater Value

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:	
$SUB_{GH} = (\text{Human toxicity} + \text{mobility} + 3) * (\text{Containment} + 1) + \text{Substance Qty}$	SUB _{GH} 179
$MIG_G = \text{Depth to Aquifer} + \text{Net Precip} + \text{Hydraulic Conductivity}$	MIG _G 13
$REL_G = \text{Release to Groundwater}$	REL _G 5
$TAR_{GH} = \text{Aquifer Use} + \text{Well Distance} + \text{Population Served} + \text{Area Irrigated}$	TAR _{GH} 2
	GW_H 35.1



Legend:

- Property location (approximate)
- ⊗ Groundwater monitoring well (approximate)
- ⊗ Destroyed groundwater monitoring well (approximate)
- Soil boring with groundwater grab sample (approximate)
- Current station features
- Former (pre-1995) station features
- Current USTs
- Former USTs
- IP product recovery system wells
- EW product recovery system wells

Notes:

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

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Boeing Field Chevron
 10805 Tukwila Int'l Blvd
 Tukwila, WA 98168

Site Overview Map

CSID 7030
 CSID7030.vsd

Washington Ranking Method

Route Scores Summary and Ranking Calculation Sheet

Site Name: Boeing Field Chevron

CSID: 7030

Site Address: 10805 Tukwila Int'l Blvd; Tukwila, WA 98168

FSID: 2551

HUMAN HEALTH ROUTE SCORES

Enter Human Health Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	21.4	4
Air	13.1	2
Groundwater	35.1	3

H=	4
M=	3
L=	2

$$\begin{array}{c}
 H^2 + 2M + L \\
 \hline
 16 + 6 + 2 \\
 \hline
 8
 \end{array}$$

**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	38.4	4
Air	1.3	1

H=	4
L=	1

$$\begin{array}{c}
 H^2 + 2L \\
 \hline
 16 + 2 \\
 \hline
 7
 \end{array}$$

**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 - March 2014 Values

Quintile	Human Health			Environment	
	Surface Water	Air	Ground Water	Surface Water	Air
5	>= 30.0	>= 35.6	>= 50.7	>= 49.6	>= 29.5
4	>= 21.1	>= 22.4	>= 40.4	>= 30.6	>= 20.5
3	>= 12.5	>= 14.1	>= 32.2	>= 22.7	>= 9.5
2	>= 6.2	>= 7.9	>= 23.1	>= 10.2	>= 1.4
1	< 6.2	< 7.9	< 23.1	< 10.2	< 1.4

Quintile value associated with each route score entered above