SITE HAZARD ASSESSMENT

WORKSHEET 1

Summary Score Sheet

SITE INFORMATION:

Site Name: Litschke Residential Property
Address: 809 Highway 101, Chinook
Ecology Facility Site ID No.: 9612322
Section/Township/Range: 08/09N/10W
Latitude: 46.27621 Longitude: -123.94902

Site scored/ranked for the August 2014 update
Today's date: September 30, 2013

SITE DESCRIPTION:

The subject site consists of two localized tax parcels designated as "residential" in an area of Chinook zoned for mixed retail, service and residential uses. The two associated parcels use the same parcel number: 73002045000

The site is generally rectangular in shape, occupies approximately 0.25 acres, and rests at approximately 15 feet above mean sea level. The Pacific Ocean lies approximately 723 feet southwest of the subject site. State Route 101 borders the property to the northeast and Preston Lane provides the southeastern boundary for this site. Currently the site houses a single family residence.

In August of 2005, the Washington State Department of Ecology (Ecology) received a complaint on the Environmental Report Tracking System (ERTS). The complaint was in regards to an above ground storage tank (AST) on a residential property that had rotted out and released approximately 200 gallons of heating oil to the surrounding soil.

In October of 2005, Cowlitz Cleanup Sweep collected six soil samples from the AST's location. Two of the six soil samples returned above the MTCA Method A Cleanup Level for diesel, 2,000 mg/kg. Groundwater was encountered, and displayed characteristics that potentially contributed to soil contamination.

In March of 2006, Soil Solutions Environmental Services, Inc (SS), collected soil and groundwater samples from the area surrounding the AST. Six soil samples were collected from the site. The soil samples returned with diesel, benzene and xylene contamination above their respective MTCA Method A Cleanup Levels. Groundwater was encountered at five feet below ground surface. Six groundwater samples were collected from the site. The samples returned with diesel, benzene, toluene, ethyl benzene and xylene contamination above their respective MTCA Method A Cleanup Levels.

Between May and June of 2006, SS removed approximately 34 tons of contaminated soil and approximately 780 gallons of impacted groundwater from the site. Contaminated soil remained on the

northern wall of the excavation and was unable to be removed without potentially impacting the foundation of the residence. Samples confirmed remaining soil and groundwater contamination. In July of 2006 additional soil samples from the northern wall of the excavation were collected. The samples returned above the MTCA Method A Cleanup Levels for diesel, benzene and xylene.

In September of 2006, Ecology attempted to conduct a site visit to investigate the prior complaint. The inspector could not make contact with the property owner.

In November of 2007, Ecology added the subject site to the Confirmed or Suspected Contaminated Sites List (CSCSL), as a state cleanup site awaiting a Site Hazard Assessment.

SPECIAL CONSIDERATIONS (include limitations in site file data or data which cannot be accommodated in the model, but which are important in evaluating the risk associated with the site, or any other factor(s) over-riding a decision of no further action for the site):

The scope of this Site Hazard Assessment did not include a hydrogeologic survey of the subject site and surrounding area. The groundwater contamination documented or inferred at the subject site is

therefore considered to have the potential to impact any well located within the prescribed 2-mile radius and all such wells were used in the scoring process.

ROUTE SCORES:

Surface Water/Human Health: 31.7
Surface Water/Environmental.: 63.4
Air/Human Health: 31.1
Air/Environmental: 32.4
Groundwater/Human Health: 48.4

OVERALL RANK: 1

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE**

   a. List those substances to be considered for scoring: Source: 1,2,3

   TPH as Diesel (from naphthalene), benzene, and xylene

   b. Explain basis for choice of substance(s) to be used in scoring.

   TPH as Diesel, benzene and xylene will be used because they are confirmed, through sampling, to be present at this site and available to the surface water route.

   c. List those management units to be considered for scoring: Source: 1,2,3

   Spills, discharges, and contaminated soil

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

   Spills, discharges, and contaminated soil will be the management unit used for scoring due to suspected contaminated surface soils

2. **AIR ROUTE**

   a. List those substances to be considered for scoring: Source: 1,2,3

   TPH as Diesel (from naphthalene), benzene, and xylene

   b. Explain basis for choice of substance(s) to be used in scoring.

   TPH as Diesel, benzene and xylene will be used because they are confirmed, through sampling, to be present at this site and available to the air route.

   c. List those management units to be considered for scoring: Source: 1,2,3

   Spills, discharges, and contaminated soil

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

   Spills, discharges, and contaminated soil will be the management unit used for scoring due to suspected contaminated surface soils

3. **GROUNDWATER ROUTE**

   a. List those substances to be considered for scoring: Source: 1,2,3

   TPH as Diesel (from naphthalene), benzene, and xylene

   b. Explain basis for choice of substance(s) to be used in scoring.

   TPH as Diesel, benzene and xylene will be used because they are confirmed, through sampling, to be present at this site and available to the groundwater route.

   c. List those management units to be considered for scoring: Source: 1,2,3

   Spills, discharges, and contaminated soil

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

Spills, discharges, and contaminated soil will be the management unit used for scoring due to suspected contaminated surface soils

WORKSHEET 4
Surface Water Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

	Substance	Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Benzene	5	8	3306	3	--	ND	A	0.029	5
2	TPH as Diesel (from Naphthalene)	20	6	490	5	0.004	3	--	--	ND
3	Xylene	10,000	2	50	10	2	1	--	--	ND
4										
5										
6										

** Potency Factor*

Source: 1,2,3

Highest Value: 10
(Max = 10)

Plus 2 Bonus Points? 2

Final Toxicity Value: 12
(Max = 12)

1.2 Environmental Toxicity ( ) Freshwater (X) Marine

	Substance	Acute Water Quality Criteria		Non-Human Mammalian Acute Toxicity	
		(µg/L)	Value	(mg/kg)	Value
1	Benzene	5100	2	3306	3
2	TPH as Diesel (from Naphthalene)	2350	4	490	5
3	Xylene	--	ND	50	10
4					
5					
6					

Source: 2,3

Highest Value: 10
(Max = 10)

1.3 Substance Quantity	
Explain Basis: Documentation states approximately 200 gallons of petroleum released	Source: 1,2 **Value: 1** (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment; Explain basis:** Spill, discharge, or contaminated soil at the surface with unknown run-on/run-off controls	1,2	**10** (Max = 10)
2.2	**Surface Soil Permeability:** Westport fine sand	2,8	**1** (Max = 7)
2.3	**Total Annual Precipitation:** 80.1-100 inches	2,4	**5** (Max = 5)
2.4	**Max 2yr/24hr Precipitation:** 3.44 inches	2,15	**3** (Max = 5)
2.5	**Flood Plain:** Not in a flood plain	2,14	**0** (Max = 2)
2.6	**Terrain Slope:** 8.121 foot elevation change over a 723.2 foot distance, 1.12% slope	2,7,16	**1** (Max = 5)

3.0 TARGETS

		Source	Value
3.1	**Distance to Surface Water:** The Pacific Ocean lies approximately 723 feet west of the subject site	2,7	**10** (Max = 10)
3.2	**Population Served within 2 miles (see WARM Scoring Manual Regarding Direction):** Approximately 564 residents served by surface water without two miles	2,7,9,10	**24** (Max = 75)
3.3	**Area Irrigated by surface water within 2 miles : (0.75)*√ # acres =** Approximately 15 acres irrigated by surface water	2,7	**3** (Max = 30)
3.4	**Distance to Nearest Fishery Resource:** The Pacific Ocean lies approximately 723 feet west of the subject site	2,7	**12** (Max = 12)
3.5	**Distance to, and Name(s) of, Nearest Sensitive Environment(s):** The Pacific Ocean lies approximately 723 feet west of the subject site	2,7	**12** (Max = 12)

4.0 RELEASE

Explain Basis: No evidence of a release to surface water, documented contamination in surface soil, which is available to the surface water route	Source: 1,2 **Value: 0** (Max = 5)

WORKSHEET 5
Air Route

1.0 SUBSTANCE CHARACTERISTICS

1.1. Introduction (WARM Scoring Manual) – Please review before scoring

1.2 Human Toxicity

	Substance	Air Standard ($\mu g/m^3$)	Value	Acute Toxicity (mg/m^3)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Benzene	1448.6	10	31,947	3	--	ND	A	0.029	5
2	TPH as Diesel (from Naphthalene)	166.5	4	--	ND	--	ND	--	--	ND
3	Xylene	0.12	1	21,714	3	0.085	1	--	--	ND
4										
5										

* *Potency Factor*

Source: 1,2,3
Highest Value: 10
(Max = 10)
Plus 2 Bonus Points? 0
Final Toxicity Value: 10
(Max = 12)

1.3 Mobility (Use numbers to refer to above listed substances)

	1.3.1 Gaseous Mobility	1.3.2 Particulate Mobility		
	Vapor Pressure(s) (mmHg)	Soil Type	Erodibility	Climatic Factor
1	5.6E-03 = 4	Fine sand	220	<1
2	8.2E-02 = 3	Fine sand	220	<1
3	7.0E-03 = 3	Fine sand	220	<1

Source: 1,2,3
Value: 4
(Max = 4)

Source: 2,3
Value: 2
(Max = 4)

1.4 Highest Human Health Toxicity/ Mobility Matrix Value (from Table A-7)
(Use highest of: 4) **Final Matrix Value: 20**
(Max = 24)

1.5 Environmental Toxicity/Mobility –						
Substance		**Non-human Mammalian Inhalation Toxicity (mg/m^3)**	**Acute Value**	**Mobility (mmHg)**	**Value**	**Matrix Value**
2	Benzene	31,947	3	5.6E-03	4	6
6	Xylene	21,714	3	7.0E-03	3	5

Highest Environmental Toxicity/Mobility Matrix Value (Table A-7) = **Final Matrix Value: 6**
(Max = 24)

1.6 Substance Quantity	
Explain Basis: Documentation states approximately 200 gallons of petroleum released	Source: 1,2 **Value: 1** (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	**Value**
2.1	**Containment:** No cover, surface spill/discharge	1,2	**10** (Max = 10)

3.0 TARGETS

		Source	**Value**
3.1	**Nearest Population:** The adjacent parcel is a residential property	2,7	**10** (Max = 10)
3.2	**Distance to [and name(s) of] nearest sensitive environment(s):** A forested wetland lies approximately 616 feet northwest of the subject site	2,13	**7** (Max = 7)
3.3	**Population within 0.5 miles:** Approximately 684 residents within 0.5 miles	2,7	**26** (Max = 75)

4.0 RELEASE

Explain Basis for scoring a release to air: No confirmed release to air, however spills to surface soils are available to the Air route	Source: 1,2 **Value: 0** (Max = 5)

WORKSHEET 6
Groundwater Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

	Substance	Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Benzene	5	8	3306	3	--	ND	A	0.029	5
2	TPH as Diesel (from Naphthalene)	20	6	490	5	0.004	3	--	--	ND
3	Xylene	10,000	2	50	10	2	1	--	--	ND
4										
5										
6										

* *Potency Factor*

Source: 1,2,3

Highest Value: 10
(Max = 10)

Plus 2 Bonus Points? 2

Final Toxicity Value: 12
(Max = 12)

1.2 Mobility (use numbers to refer to above listed substances)

Cations/Anions [Coefficient of Aqueous Migration (K)] OR	Solubility (mg/L)
1=	1= 1.8E+03 = 3
2=	2= 3.0E+01 = 1
3=	3 = 2.0E+02 = 2
4=	4=
5=	5=
6=	6=

Source: 2,3

Value: 3
(Max = 3)

1.3 Substance Quantity:	
Explain basis: Documentation states approximately 200 gallons of petroleum released	Source: 1,2 **Value: 1** (Max=10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment (explain basis):** All spills, discharges, and contaminated soil are assigned a value of 10	1,2	**10** (Max = 10)
2.2	**Net precipitation:** 80.1-100 inches	2,4	**5** (Max = 5)
2.3	**Subsurface hydraulic conductivity:** Westport fine sand	2,8	**3** (Max = 4)
2.4	**Vertical depth to groundwater:** Confirmed groundwater contamination, a value of 8 is assigned	1,2	**8** (Max = 8)

2.0 TARGETS

		Source	Value
3.1	**Groundwater usage:** Private supply with alternate sources available	2,5,6	**4** (Max = 10)
3.2	**Distance to nearest drinking water well:** Nearest well is located approximately 1,760 feet northeast of the subject site	2,5,7	**3** (Max = 5)
3.3	**Population served within 2 miles:** Approximately 3 residents served by groundwater within two miles of the subject site	2,5,6	**2** (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles:** **(0.75)***√ Two acres documented to be irrigated by groundwater within two miles of the subject site	2,9,10	**1** (Max = 50)

3.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: Documented release to groundwater, confirmed through sampling	1,2	**5** (Max = 5)

SOURCES USED IN SCORING

1. Washington State Department of Ecology Site Hazard Assessment File/TCP file
2. Washington State Department of Ecology, WARM Scoring Manual, April 1992
3. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992
4. U.S. Department of Interior Geological Survey Topographical Map
5. Washington State Department of Health, Public Water System Database
6. Washington State Department of Ecology, Water Resources Explorer
7. Pacific County GIS map
8. Washington State Department of Agriculture, soil maps
9. Washington State Department of Ecology Water Rights Tracking System
10. GeoCommunicator, Land Survey Information System
11. Model Toxics Control Act, Statue and Regulation, November 2007
12. Washington State Department of Ecology Well Log Viewer
13. Washington State Department of Ecology, Washington State Costal Atlas Map
14. Washington State Department of Ecology, Costal Atlas, Flood Hazard Maps
15. NOAA Atlas 2 Precipitation Frequency Estimates
16. Daft Logic, Google Maps Find Altitude