SITE HAZARD ASSESSMENT

WORKSHEET 1

Summary Score Sheet

SITE INFORMATION:

Sudden Valley Resort
2650 Lake Louise Road,
Bellingham, Whatcom County, WA 98225
Ecology Facility Site ID: 47652753
Section/Township/Range: Sec 37/T04N/R07E

Site scored/ranked for the February 19, 2009 update

February 9, 2009

SITE DESCRIPTION

The site is owned by the Sudden Valley Community Association. It is located at 2650 Lake Louise Road. Surrounding uses are residential homes, The Sudden Valley Community Association maintenance shop, and vehicle storage for Sudden Valley residents. The site is listed due to the presence of diesel range hydrocarbons in the soil and groundwater as a result of historic fueling activities on the site. The site is presently used as a sewage lift station for the Lake Whatcom Water and Sewer District.

The contamination is located at the apex of two streams Beaver Creek and Austin Creek. Beaver Creek flows south easterly and Austin Creek flows north easterly until they join on the east side of the site. The site is slightly elevated above the creeks by approximately 4 feet.

Petroleum contamination was originally found in July of 1999. The contamination stemmed from prior fueling activities on the site. In order to determine the amount of contamination, 11 test pits were completed. Additionally 3 monitoring wells (MW1-MW3) were installed. Soil and water samples taken from these test pits and wells showed soils to be contaminated with diesel and gasoline above the MTCA method A standard and groundwater contamination above MTCA method A for diesel fuel.

In March of 2000 the original remediation of the site took place. At that time 375 cubic yards of material were excavated. That material was stockpiled on site to be land farmed. Monitoring wells MW-1, 2 and 3 were removed during the excavation. Monitoring Well 3 was replaced in July of 2000 by monitoring well 4, which is still on site. Groundwater was not encountered during the excavation.

Samples were taken at the limits of excavation. The only sample (25-10) that was found to have contamination above MTCA method A levels was at the northern limits of the excavation. Continued excavation could not occur there due to the proximity to Beaver Creek. Sample 25-10 was found to have levels of diesel at 5,900 parts per million in soil.

Records show that MW-4 was monitored quarterly or semi annually from August of 200 until as late as February of 2002. This monitoring showed continual levels of diesel in the groundwater exceeding MTCA method A cleanup standards. The latest sampling event in February of 2002 showed diesel range hydrocarbons at a concentration of 1.8 mg/l in the groundwater. This is well above the MTCA method A cleanup level of .5 mg/l.

The site is being scored for subsurface diesel contamination as a result of known contamination to soil and groundwater above MTCA method A cleanup levels. Groundwater in the area relatively shallow and is encountered at approximately 10 feet deep. The site has no cover.

Table 1. SOIL SAMPLING RESULTS

Sample No.	Analyte Found	Analytical Method	Sample Result (Mg/kg)	Applicable Standard	(Mg/kg)
EX-25-10	Diesel	NWTPH-DX	5,900	MTCA A *	2,000

*MTCA A refers to the Model Toxics Control Act Method A Soil Cleanup Levels for Industrial Land Use

Table 2. GROUNDWATER SAMPLING RESULTS

Sample No.	Analyte Found	Analytical Method	Sample Result (Mg/l)	Applicable Standard	(Mg/l)
MW-4	TPH-Diesel	NWTPH-DX	1.8	MTCA A *	0.5

*MTCA A refers to the Model Toxics Control Act Method A Groundwater Cleanup Levels.

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):

Due to the significant contamination documented on-site being primarily subsurface, the surface water and air routes are not applicable for WARM scoring for this site. Thus, only the groundwater route will be scored.

ROUTE SCORES:

Surface Water/Human Health: NS
Surface Water/Environmental: NS
Air/Human Health: NS
Air/Environmental: NS
Groundwater/Human Health: 20.4

OVERALL RANK: 5

WORKSHEET 2
Route Documentation

1. **GROUNDWATER ROUTE**

   a. List those substances to be considered for scoring: Source:

      Diesel

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

      These substances were detected in on-site surface soil or groundwater samples at concentrations exceeding their respective MTCA cleanup levels.

   c. List those management units to be considered for scoring: Source:

      Subsurface soil, Groundwater

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

      The contaminating substances were detected in on-site subsurface soil or groundwater samples at concentrations exceeding their respective MTCA cleanup levels.

WORKSHEET 6
Groundwater Route

1.0 SUBSTANCE CHARACTERISTICS

1.2 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	Diesel	160	4	490	5	0.004	3	ND	-	-

* *Potency Factor*

Source: 1,2,3,4

Highest Value: 5
(Max = 10)

Plus 2 Bonus Points? NO

Final Toxicity Value: 5
(Max = 12)

1.2 Mobility (use numbers to refer to above listed substances)		
Cations/Anions	OR	Solubility (mg/L)
1=	**1=** $3.0 \times 10^{1} = 2$	

Source:3,4

Value: 2
(Max = 3)

1.3 Substance Quantity:	
Explain basis: Unknown, use default = 1	Source:1,2 **Value: 1** (Max=10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment (explain basis):**	8	(Max = 10)
2.2	**Net precipitation:** 22.3" – 5.6" = 16.7"	5	**2** (Max = 5)

2.3	**Subsurface hydraulic conductivity:** sandy silty gravel	6	**3** (Max = 4)
2.4	**Vertical depth to groundwater:** Observed release = 0 feet	1,2	**8** (Max = 8)

3.0 TARGETS

		Source	Value
3.1	**Groundwater usage:** Public supply, Alternate sources available	7	**4** (Max = 10)
3.2	**Distance to nearest drinking water well:** >2,640-5,000 **feet**	7	**2** (Max = 5)
3.3	**Population served within 2 miles: = √ 225 = 15**	7	**15** (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles: (0.75)*√614 acres = 18.6**	7	**18.6** (Max = 50)

4.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: Documented by analytical data	1,2	**5** (Max = 5)

SOURCES USED IN SCORING

1. GeoEngineers, Inc. Report of Remedial Excavation Activities Area Z Sudden Valley, Washington May 23, 2000
2. GeoEngineers, Inc.February 2002 Ground Water Sampling, Sudden Valley Community Association Area February 26, 2002
3. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992
4. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
5. Washington Climate – Net Rainfall Table
6. United States Department of Agriculture Soil Conservation Service, Soil Survey of Whatcom County Area, Washington,
7. Washington State Department of Ecology, Water Rights Application System (WRATS) printout for two-mile radius of site.
8. Site Hazard Assessment Site Visit, January 16, 2009