

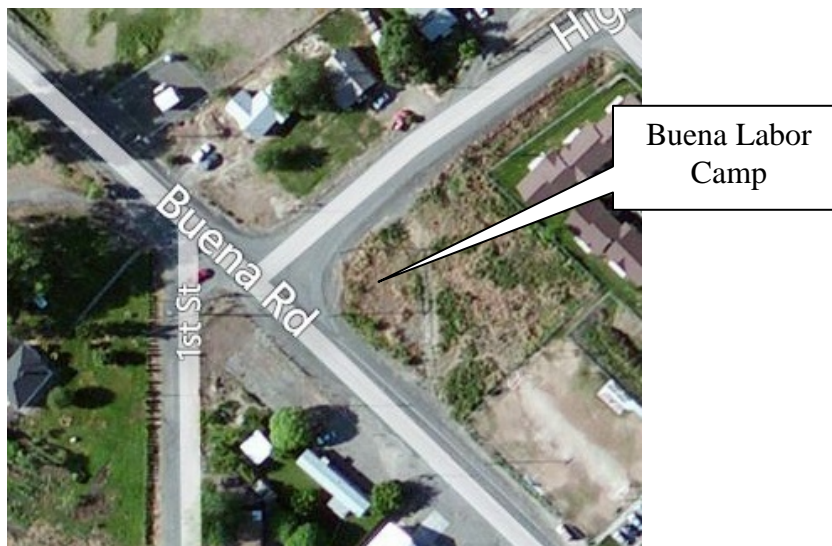
WORKSHEET 1  
Summary Score Sheet

**SITE INFORMATION:**

Name: **Buena Labor Camp**  
Address: **Buena Road and Highland Drive**  
City: **Buena** County: **Yakima** State: **WA** Zip: **98921**  
Section/Township/Range: **S21/T11N/R20E**  
Latitude: **46.43059** Longitude: **-120.31478**  
FSID: 27377292  
Cleanup Site ID: 5800

*Site scored/ranked for the August 2013 update*

**SITE DESCRIPTION:**



During the installation of sewer lines in 1993, the Yakima County Public Works Department discovered petroleum contaminated soil at several locations in Buena, WA. The contamination was determined to have leaked from underground storage tanks (USTs) associated with several historical and existing gas stations in the area. Historically, the Buena Labor Camp site operated as a Chevron Gas Station, and was considered a contributor to the contamination.

In the area of the Buena Labor Camp site, one 500-gallon bare steel UST was penetrated during power pole installation work and was removed from the right-of-way. One soil sample was collected from the base of the tank excavation and analyzed for TPH and BTEX. Lab results revealed 11,600 ppm TPH, 25 ppm toluene, and 580 ppm xylenes. No benzene or ethylbenzene was detected.

In 1997, Ecology installed 12 groundwater monitoring wells to characterize contamination in the Buena area.

In May 2000, a PLSA consultant dug five test pits on the Dills Property (a former gas station to the northeast) and the Buena Labor Camp site. Gasoline impacted soil was found in two test pits.

In May 2002, 550- and 1000-gallon USTs were removed from the site by Sage Earth Sciences (Sage). The age of the tanks and contents stored were unknown but they were believed to have been used as part of the historical gas station. A visual inspection of the tanks found corrosion, pitting, and numerous holes.

Seven soil samples were collected by Sage just above groundwater, which was encountered at four feet bgs. The samples were analyzed for TPH-G, BTEX and lead. All constituents were detected, but samples 1, 2, 3, and 4 had gas (30-95 ppm) and/or benzene (0.03) exceeding MTCA cleanup levels.

Approximately 900 yd<sup>3</sup> of soil were removed from the excavation; 400 yd<sup>3</sup> was impacted. The impacted soil was landfarmed on property about 500 feet northwest of the site.

In July 2010, GeoEngineers performed site characterization activities at three properties in Buena, including the Buena Labor Camp. The project included evaluating the existing groundwater monitoring wells and assessing soil and groundwater conditions through groundwater sampling of usable wells and direct-push drilling techniques. Five additional groundwater monitoring wells were installed at this time. In the area of Buena Labor Camp, ethylbenzene, xylenes, and gasoline were detected in groundwater samples collected from MW3 and MW14. A soil sample collected from DP-2 at 4 feet bgs revealed the presence of heavy oil-range TPH.

Ecology sampled groundwater wells in the Buena area for four consecutive quarters from July 2010 to June 2011. MWs 3 and 14 are most representative of groundwater contamination at Buena Labor Camp. A summary of the highest concentrations are included in Table 1 below.

**Table 1:** Summary of analytical results exceeding cleanup levels for monitoring wells MW-3 & 14 from the 2010 – 2011 sampling events.

<b>Well</b>	<b>Gas (ppb)</b>	<b>Lube Oil (ppb)</b>	<b>EDB</b>
MW3	<b>1090</b>		
MW14	<b>3360</b>	<b>544</b>	<b>0.14</b>
MTCA Method A cleanup level	1000	500	0.01

The groundwater gradient is fairly flat, but generally flows to the southeast.

#### **SPECIAL CONSIDERATIONS:**

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.

The substances used to score toxicity are based on contaminants found in soil at the site and confirmed groundwater contamination exceeding Method A cleanup levels.

Drinking water population was based on public water supply, which was added in 1986. Although there are a number of domestic private wells in the area, it is assumed that most of the population is served by the public wells. However, in consideration of the nearest drinking water well, a more conservative approach was taken and did include domestic drinking water wells.

**ROUTE SCORES:**

Surface Water/Human Health: NA  
Air/Human Health: NA  
Groundwater/Human Health: 58.5

Surface Water/Environmental.: NA  
Air/Environmental: NA

**OVERALL RANK: 2**

WORKSHEET 2  
Route Documentation

1. **SURFACE WATER ROUTE** – *Not Scored*

2. **AIR ROUTE** – *Not Scored*

3. **GROUNDWATER ROUTE**

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

**TPH-G, ethylbenzene, xylenes, lube oil and EDB**

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

**Ethylbenzene, xylenes and EDB have human toxicity data.**

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

**Subsurface soils and groundwater**

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

**Soil and/or groundwater sampling confirms contamination at the site.**

## 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	Ethylbenzene	700	4	3500	3	0.1	1	--	--	--
2	EDB	0.05	10	90	8	--	ND	0.8	8.5	5.6
3	Xylenes	10000	2	50	10	2	1	--	--	--

\* Potency Factor

Source: 5

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= 150 = 2
2 =	2 = 4300 = 3
	3 = 200 = 2

Source: 6, 7

Value: 3

(Max = 3)

1.3 Substance Quantity:	
<b>Explain basis:</b> An unknown quantity of contaminated soil remains at the site. It is estimated to be between 10 and 100 cubic yards.	Source: <u>7</u> <b>Value: <u>2</u></b> (Max=10)

## 2.0 MIGRATION POTENTIAL

		Source	Value
2.1	<b>Containment (explain basis):</b> Contamination is a result of leaking underground storage tanks.	1, 2, 3, 4, 5	<b>10</b> (Max = 10)
2.2	<b>Net precipitation:</b> 0.3"	8	<b>1</b> (Max = 5)
2.3	<b>Subsurface hydraulic conductivity:</b> sand and gravel	4	<b>4</b> (Max = 4)
2.4	<b>Vertical depth to groundwater:</b> 0 – confirmed groundwater contamination	5	<b>8</b> (Max = 8)

## 3.0 TARGETS

		Source	Value
3.1	<b>Groundwater usage:</b> All three public supply wells that supply Buena with drinking water seem to be within 1300' of site	10, 11	<b>9</b> (Max = 10)
3.2	<b>Distance to nearest drinking water well:</b> <u>~1600</u> feet	11	<b>3</b> (Max = 5)
3.3	<b>Population served within 2 miles:</b> $\sqrt{\text{pop.}} = \sqrt{850} = \sim 29$	10	<b>29</b> (Max = 100)
3.4	<b>Area irrigated by (groundwater) wells within 2 miles:</b> $(0.75) * \sqrt{\# \text{ acres}} = \underline{0.75 * \sqrt{1322 \text{ acres}}} = 27$	9	<b>27</b> (Max = 50)

## 4.0 RELEASE

		Source	Value
	<b>Explain basis for scoring a release to groundwater:</b> Confirmed groundwater contamination exceeding MTCA cleanup standards.	5	<b>5</b> (Max = 5)

## SOURCES USED IN SCORING

1. Tank Closure Investigation, Chen-Northern Inc., July 1990
2. Soil Sampling, PLSA Engineering & Surveying, May 29, 2002
3. Exploratory Investigation Report for the Buena Market Area, Sage Earth Sciences, November 12, 2002
4. Site Characterization Report, GeoEngineers, October 21, 2010
5. Ecology site visits and groundwater sampling data
6. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992
7. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
8. Washington Climate – Net Rainfall Table
9. GWIS application using aerial photograph
10. Washington State Department of Health, Office of Drinking Water Sentry website printout for public water supplies
11. Ecology Well Log database