

CSID 2856

NFA

**WORKSHEET 1
SUMMARY SCORE SHEET**

Note: This document currently has no provision for sediment scoring route.

Site Name/Location (Street, City, County, Section/Township/Range, TCP ID Number):

Boitano Site
Between 2820 & 3100 Pacific Highway. E.
Fife, WA 98424
Pierce County
T-20 R-3E Section 11
TCP ID: S-27-6261-000

Site Description (Include management areas, substances of concern, and quantities):

Site Description/History:

The Boitano site is rectangular in shape, approximately 2.5 acres in size and it is situated along the south side of Pacific Highway East in Fife, Washington. The topography in the area is generally low-lying and relatively flat except for a network of engineered drainage ditches to the north of the site and Interstate 5 to the south of the site. These areas are slightly lower than the average site grades. The property is bound to the east and west by motel development. These areas are slightly higher than the average site grades. A shallow groundwater zone exists beneath the site at approximately five to ten feet below the ground surface.

During early 1991 site development plans resulted in the environmental consulting firms of Earth Consultants, Inc. (ECI) and Hart Crowser (HC) to conduct two separate investigations at the subject site. ECI conducted a "Phase-I" Environmental Site Assessment and HC conducted a Geotechnical Engineering Design Study. Based on the results of ECI's study, no significant concerns for contamination could be identified at the site. However, during HC's investigation, eight test pits were excavated across the site with a backhoe and petroleum hydrocarbon contamination was detected at one of the locations. The contamination was detected in test pit #16 (TP-16), which was located in the northeast corner of the site. Based on the analytical results of the samples, which were analyzed on-site using the EPA 8015 modified test method, oil (TPH-Other) was detected at a concentrations of 340 parts per million (ppm) from 0-1 feet and 59 ppm from 7-8 feet. The 340 ppm was above its respective Model Toxics Control Act (MTCA) Method "A" (residential) Cleanup Level of 200 parts per million (ppm).

In early 1996 ECI returned to the site and conducted a "Phase-II" Environmental Site Assessment to further evaluate the subsurface conditions. In doing so, ECI investigated the soil and groundwater conditions at each of the site corners by advancing borings and then developing them into monitoring wells. Based on HC's findings discussed above, a "worst case scenario" soil sample and a groundwater sample was collected from each location and analyzed by using the WTPH-D "extended" testing method. The results of ECI's assessment reported elevated concentrations of petroleum hydrocarbons in both the site soils and the groundwater at the boring / monitoring well (MW-2) location. Reportedly, diesel fuel was detected at 500 ppm and heavy oil was detected at 1,600 ppm at approximately 5 feet below the ground surface at this location. Diesel was reported in the groundwater sample from the MW-2 location at a concentration of 520 parts per billion (ppb). The location where all these petroleum hydrocarbon detections occurred (MW-2) was the same approximate location as where HC identified the petroleum contamination discussed above (TP-#16). The laboratory analysis results for the remaining three wells reported non-detect (ND) concentrations for diesel and oil.

In May 1996 the Boitanos retained the environmental consulting firm of Saltbush Environmental Services (SES) to evaluate the extent of the hydrocarbon contamination around MW-2. SES investigated the subsurface conditions in the area by excavating nine additional test pits and collecting a worst case scenario samples from each of the locations. Based on the laboratory analysis results, no petroleum hydrocarbons (or heavy metals) detected in any of the samples, at concentrations above their respective MTCA Cleanup Levels. As a result, SES recommended that a cleanup action focus on the immediate location of MW-2 and that confirmational laboratory analysis testing be performed to demonstrate that cleanup had been achieved. As a result, approximately one month later SES returned to the site and initiated a "source removal" cleanup action, on behalf of the property owner. During the remedial activities, SES discovered petroleum contaminated soil (PCS), an unknown whitish material (with a pH of 13) and several damaged 55-gallon drums that contained a black petroleum-related compound. Because the unknown materials found in the excavation did not correspond with scope of services agreed upon by SES and the property owners, SES halted the cleanup process and all of the contaminated media was returned to the excavation.

In late 1996, the Boitanos retained the environmental consulting firm of Marsh Industrial Research (MIR) to complete the cleanup for the MW-2 area discussed above. During the cleanup, MIR also encountered what appeared to be petroleum contaminated soils and a damaged 55-gallon drum in the vicinity of MW-2. Reportedly, the drum contained a tarry black substance. Based on analytical data using the 418.1 test method, the contents of the drum contained 47,000 ppm total petroleum hydrocarbons (TPH). The soil samples ranged from 350 to 750 ppm for TPH. MIR then resubmitted the soil sample with the highest reported concentration of TPH and had it run using the WTPH-D "extended" testing method. The WTPH-D "extended" laboratory analysis results reported that the same sample contained no TPH. Therefore, based on the final "Site Investigation Report" dated November 20, 1996, MIR concluded that: 1) the white material with the high pH was concrete; 2) that the hydrocarbon impacted soils were a result of plant debris interference and; 3) that due to the elevated concentrations of TPH and lead, the tarry substance was a potentially hazardous substance. As a result, the drum and contents were sent to a permitted off-site disposal facility.

Based on the above information, on May 29, 1997 the site was added to Ecology's Site Information System (S.I.S. database) of suspected and confirmed contaminated sites and recommended for a Site Hazard Assessment (SHA).

The SHA was initiated by the Tacoma-Pierce County Health Department (TPCHD) in late 1997 to fulfill the data requirements for the subsequent scoring/ranking of the site, if appropriate, under the Washington Ranking Method. Based on the complex site history discussed above, the SHA Program determined that a considerable amount of investigative work had already been conducted at the site, that further site sampling was beyond the scope of the SHA, and that the site would be ranked on the existing site data. Based on this decision, MIR requested a time extension before the SHA Program completed the assessment, so that they could demonstrate that there was no significant residual contamination left at the site. With the TPCHD's and Ecology's concurrence, MIR returned to the site in February, 1998, to conduct additional investigative / remedial activities. In doing so, the site was first segmented into 50 foot grids. MIR began by excavating the grids in the northeast corner of the site. Further excavation activities were also conducted in several other grids that were located in the southeast and northwest corner of the site (and at several areas between these grids and the northeast corner of the site). In the process of "turning over" the fill soils in these areas, 40 to 50 additional crushed drums were removed and stockpiled on-site. The drums contained two different types of unknown, black, petroleum-related compounds. These materials included a softer material (reminiscent of asphalt cold patch) and a harder material (reminiscent of roofing tar). MIR analyzed the softer material but that the harder material was never characterized. Based on the laboratory analysis data, the soft material was reported to contain 18,000 ppm diesel, 780 ppm arsenic and 1400 ppm lead. As a result, a TCLP Metals analysis was run on the material using the EPA method 1311. The results of the TCLP testing reported that the lead leached at 5.3 ppm. According to the Washington State Dangerous Waste Regulations, Chapter 173-303 WAC, leachable lead (over 5.0

ppm) in a waste material designates as a dangerous waste.

During MIR's excavation activities, the TPCHD conducted a site visit to observe the actual investigative processes and document the site conditions. In doing so, the TPCHD observed an area in the northeast corner of the site where the soils smelled of petroleum hydrocarbons. A sample of this material was collected by the TPCHD and analyzed by the WTPH-D "extended" method. According to the analytical results, the soil sample contained 930 ppm diesel and 1,200 ppm heavy oil. However, according to samples collected by MIR in the same area, diesel and heavy oil were reported at non-detect concentrations. Also during MIR's activities, groundwater was encountered at the base of the excavation at two different locations in the northeast corner of the site. The TPCHD observed sheen and what appeared to be product in these areas, collected samples of the pit water and analyzed it for petroleum hydrocarbons and total metals. Based on the results, diesel was reported to be present in the groundwater at a concentration of .5 ppm. At the time of the SHA the MTCA Cleanup Level for TPH in groundwater was 1 ppm. Lead and arsenic were also detected in the pit water at concentrations above their respective MTCA Cleanup Levels. According to TPCHD analytical data, the concentrations were reported to be 5.6 ppb lead and 9.5 ppb arsenic. MIR also documented elevated levels of lead in arsenic in these areas. Based on MIR's final "Draft" Cleanup report, no further investigations or remedial activities were conducted in the above referenced areas.

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):

Based on the above referenced data, it was determined to be likely that there is a hotspot of PCS that is relatively confined at this site. It was also determined that the hotspot has likely been diluted through a series of soil mixings, to a point that may make it difficult to relocate and/or completely remove the material. However, of most concern is that drums containing dangerous wastes and contaminated groundwaters were detected at this site. Although it appeared that MIR likely targeted and removed the area where the highest concentration of drums were buried at the site, the concentration of drums at the other locations was never fully determined. Therefore, it also appears likely that additional drums, containing dangerous wastes, remain buried at this site. Furthermore, the contaminants detected in the drum wastes at this site included TPH, arsenic and lead. As discussed above, these contaminants are the same contaminants which were detected in the groundwater, above their respective MTCA Method A Cleanup Levels. Therefore, based on the likelihood that diesel, contaminated groundwater and additional drums remain at this site, the SHA Program recommends that additional groundwater monitoring be conducted at the site and that the site owners contact the Washington State Department of Ecology Voluntary Cleanup Program for a more comprehensive site review.

ROUTE SCORES:

Surface Water/Human Health: 16.4 Surface Water/Environ.: 15.5

Air/Human Health: N.S. Air/Environmental: N.S.

Ground Water/Human Health: 63.3

WORKSHEET 2
ROUTE DOCUMENTATION

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

Source: 1-4

Arsenic, Chromium, Lead, TPH (diesel), TPH (other), pH, and Polynuclear Aromatic Hydrocarbons.

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

Arsenic, Chromium, Lead and TPH (reported as diesel) were used in scoring the surface water route, as each of their measured concentrations exceeded its representative MTCA Method "A" Clean-up Levels for soil and/or groundwater, and all were available to the ground water route through less than perfect containment. TPH (other), pH, and Polynuclear Aromatic Hydrocarbons were not used in the scoring process even though they were documented to be present (or suspected to be present) in the site soils at concentrations

List those management units to be considered for scoring:

Source: 1

Contaminated Soils.

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

Contaminated soil was the management unit scored for the surface water route. Contaminated soil was scored on the basis of the above referenced contaminants being detected in buried drums, the site soils and/or the groundwater at concentrations above their respective MTCA Method "A" Cleanup Levels.

2. AIR ROUTE

List those substances to be considered for scoring:

Source: 1-4

At the time of concluding the SHA, some remedial activities had recently occurred at the site which resulted in crushed 55-gallon drums and solid waste materials being temporarily stockpiled at the property awaiting off-site disposal. Because the waste materials had an impervious cover over them, and any remaining contamination was believed to be predominantly subsurface in nature, and because the site was not in a residential neighborhood, the Air Route was not scored for this site.

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

List those management units to be considered for scoring:

Source: 1

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

Source: 1,4

3. GROUND WATER ROUTE

List those substances to be considered for scoring:

Source: 1-4

Arsenic, Chromium, Lead, TPH (diesel), TPH (other), pH, and Polynuclear Aromatic Hydrocarbons.

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

Arsenic, Chromium, Lead and TPH (reported as diesel) were used in scoring the ground water route, as each of their measured concentrations exceeded its representative MTCA Method "A" Clean-up Levels for soil and/or groundwater, and all were available to the ground water route through less than perfect containment. TPH (other), pH, and Polynuclear Aromatic Hydrocarbons were not used in the scoring process even though they were documented to be present (or suspected to be present) in the site soils at concentrations that exceeded their representative MTCA Method "A" Clean-up Levels.

List those management units to be considered for scoring:

Source: 1

Contaminated Soils.

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

Contaminated soil was the management unit scored for the ground water route. Contaminated soil was scored on the basis of the above referenced contaminants being detected in buried drums, the site soils and/or the groundwater at concentrations above their respective MTCA Method "A" Cleanup Levels.

**WORKSHEET 4
SURFACE WATER ROUTE**

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Standard (ug/l)	Val.	Acute Toxicity (mg/kg-bw)	Val.	Chronic Toxicity (mg/kg/day)	Val.	Carcinogenicity WOE PF*	Val.
1. Arsenic	50	6	763(rat)	5	0.001	5	A 1.75	7
2. Chromium	100	6	-----	ND	0.005	3	A --	ND
3. Lead	5	8	-----	ND	-----	ND	B2 --	ND
4. TPH (diesel)	20	6	490(rat)	5	0.004	3	- --	ND

*Potency Factor Source: 2
Highest Value: 8
(Max.=10)
+2 Bonus Points? 2
Final Toxicity Value 10
(Max.=12)

1.2 Environmental Toxicity

(X) Freshwater
() Marine

Substance	Acute Water Quality Criteria (ug/l)	Value	Non-human Mammalian Acute Toxicity (mg/kg)	Value	Source: 10-14	Value: <u>4</u>
1. Arsenic	360	4	-----	5		
2. Chromium	1100	2	-----	--		
3. Lead	140	4	-----	--		
4. TPH (diesel)	2300	2	-----	5		

(Max.=10)

1.3 Substance Quantity: Unknown Source: 10-14 Value: 1
 Explain basis: Default value of "1" used. (Max.=10)

**WORKSHEET 6
GROUND WATER ROUTE**

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Standard		Acute Toxicity		Chronic Toxicity		Carcinogenicity		
	(ug/l)	Val.	(mg/kg-bw)	Val.	(mg/kg/day)	Val.	WOE	PF*	Val.
1. Arsenic	50	6	763(rat)	5	0.001	5	A	1.75	7
2. Chromium	100	6	-----	ND	0.005	3	A	--	ND
3. Lead	5	8	-----	ND	-----	ND	B2	--	ND
4. TPH (diesel)	20	6	490(rat)	5	0.004	3	-	--	ND

Potency Factor Source: 2,10-14
Highest Value: 8
(Max.=10)
+2 Bonus Points? 2
Final Toxicity Value: 10
(Max.=12)

1.2 Mobility (Use numbers to refer to above listed substances)
 Cations/Anions: 1)=3 ; 2)=3 ; 3)=2 Source: 1 Value: 3
(Max.=3)

OR
 Solubility(mg/l): 4)=1

1.3 Substance Quantity: Unknown Source: 1,10-14 Value: 1
 Explain basis: Default value of "1" used. (Max.=10)

2.0 MIGRATION POTENTIAL

2.1 Containment Source: 1,10-14 Value: 10
 Explain basis: Contaminated soil from spills or discharges have a value of 10 for containment. (Max.=10)

2.2 Net Precipitation: 19.1 inches Source: 4 Value: 2
(Max.=5)

2.3 Subsurface Hydraulic Conductivity: sandy Silt, silty Sand, clayey Sand. Source: 14 Value: 3
(Max.=4)

2.4 Vertical Depth to Ground Water: <25 feet. Source: 8 Value: 8
(Max.=8)

WORKSHEET 6 (CONTINUED)
GROUND WATER ROUTE

3.0 TARGETS

- 3.1 Ground Water Usage: Pub./Priv.- alt. available. Source: 3 Value: 4
(Max.=10)
- 3.2 Distance to Nearest Drinking Water Well: 2,750 ft. Source: 5,6 Value: 2
(Max.=5)
- 3.3 Population Served within 2 Miles: √pop.=√>10,000 Source: 7-9 Value: 100
(Max.=50)
- 3.4 Area Irrigated by (Groundwater) Wells within
2 miles: 0.75√no.acres = Source: 9 Value: 7
0.75√93 = 0.75 (9.6)= 7 (Max.=100)

4.0 RELEASE

Explain basis for scoring a release to ground water: Documentation was made and is available
showing that lead and arsenic are in the ground-
water at concentrations above their respective
MTCA Method "A" Cleanup Levels. Source: 10-14 Value: 5
(Max.=5)

SOURCES USED IN SCORING

1. Washington Department of Ecology, WARM Scoring Manual, April 1992.
2. Washington Department of Ecology, Toxicology Database for use in Washington Ranking Method Scoring, January 1992.
3. Tacoma-Pierce County Health Department, 1995 SHA, on-site observations/file review.
4. Washington Climate for Pierce County, National Weather Service Forecast Office.
5. U.S.G.S. Topo Map, 7.5 Min. Series, Photorev. 1981.
6. The Thomas Guide, Pierce County Street Guide and Directory, 1998 Edition.
7. DOH Public Water Supply System.
8. DOE/TPCHD Well Logs.
9. DOE Water Rights Information System (WRIS).
10. "Geotechnical Engineering Design Study", J-3211, By Hart Crowser, dated February 22, 1991.
11. "Limited Phase II Environmental Site Assessment", Proposed Lexus Site, 2800 Pacific Hwy East, Fife WA., by Earth Consultants Inc., dated April 11, 1996.
12. "Limited Soil Sampling & Testing", The Proposed Lexus Property Project, 2800 (Portion) Pacific Hwy. South, Fife, Pierce County WA., Project # 95052561, By Saltbush Environmental Services, Inc., dated May 24, 1996.
13. Saltbush Environmental Services, Inc, letter to Mrs. Giuditta Boitano, Re: Proposed Lexus Property - Excavation Project, dated June 7, 1996.
14. "Site Investigation At 2800 Pacific Highway East, Fife, WA., By marsh Industrial Research, dated November 20, 1996.
15. Census Data Map and Tables, Provided by PALS - Advance Planning.
16. Firm Flood Insurance Rate Map, Tacoma Tideflats Panel.
17. "Drainage Map, Commencement Bay - Nearshore / Tideflats Area" (air Photo), dated January 1, 1995.

WASHINGTON RANKING METHOD SCORING PACKAGE

Input values from worksheets 4, 5, and 6 to these three spreadsheets.
Press F9 or right mouse button to calculate scores.

BOITANO SITE

WORKSHEET 4			
SURFACE WATER ROUTE			
		Site 1	Site 2
SUBSTANCE CHARACTERISTICS			
Human Health Toxicity			10
Environmental Toxicity			4
Substance Quantity			1
Containment			10
MIGRATION			
Soil Permeability			3
Annual Precipitation			3
2-yr/24-hour Precip.			2
Flood Plain			0
Terrain Slope			1
TARGETS			
Distance to Surf. Water			10
Population Served			0
Area Irrigated			0
Distance to Fisheries			0
Sensitive Environment			0
RELEASE			0
	=====	=====	
	==	==	
SW HH ROUTE SCORE	0.0		16.4
SW Env. ROUTE SCORE	0.0		15.5

WASHINGTON RANKING METHOD SCORING PACKAGE

Input values from worksheets 4, 5, and 6 to these three spreadsheets.
Press F9 or right mouse button to calculate scores.

BOITANO SITE

	Site 1	Site 2
WORKSHEET 6		
GROUND WATER ROUTE		
	Site 1	Site 2
SUBSTANCE CHARACTERISTICS		
Toxicity	10	10
Mobility	3	3
Substance Quantity	1	1
Containment	10	10
MIGRATION		
Net Precipitation	2	2
Hydraulic Conductivity	3	3
Depth to Ground Water	8	8
	-----	-----
TARGETS		
Aquifer Usage	4	4
Nearest Well Distance	2	2
Population Served	100	100
Area Irrigated	7	7

RELEASE	5	5
	=====	=====
	==	==
GW ROUTE SCORE	63.3	63.3
	=====	=====
	==	==

WASHINGTON RANKING METHOD

ROUTE SCORES SUMMARY AND RANKING CALCULATION SHEET

Site name: BOITANO Region: _____

Street, city, county: _____

Ecology TCP ID: S-27-6261-000

This site was (X) ranked, () re-ranked, on December 9, 1994 based on quintile values from a total of 432 assessed/scored sites.

Pathway	Route Score(s)	Quintile Group number(s)	Priority scores:
SW-HH	<u>16.4</u>	<u>3</u>	$\frac{H^2 + 2M + L}{8} = \frac{25 + 4}{8} = \frac{31}{8} = 3.875$
Air-HH	_____	_____	<u>4</u>
GW-HH	<u>67.3</u>	<u>5</u>	
SW-En	<u>15.5</u>	<u>2</u>	$\frac{H^2 + 2L}{7} = \frac{4}{7} = .57 = 1$
Air-En	_____	_____	

Use the matrix presented to the right, along with the two priority scores, to determine the site ranking. N/A refers to where there is no applicable pathway.

Human Health	Environment					N/A
	5	4	3	2	1	
5	1	1	1	1	1	1
4	1	2	2	2	<u>3</u>	2
3	1	2	3	4	4	2
2	2	3	4	4	5	3
1	2	3	4	5	5	5
N/A	3	4	5	5	5	N/A

DRAFT / FINAL

Matrix ("bin") Ranking: 3 or _____ No Further Action

CONFIDENCE LEVEL: The relative position of this site within this bin is:

- _____ almost into the next higher bin.
- _____ right in the middle, unlikely to ever change.
- _____ almost into the next lower bin.