

WORKSHEET 1
Summary Score Sheet

SITE INFORMATION:

Name: Lewis and Clark Elementary School
Address: 1130 Princeton Avenue
City: Wenatchee County: Chelan State: WA Zip: 98801
Section/Township/Range: T23N R20E S33
Latitude: 47° 26' 15" Longitude: 120° 19' 43"
Facility Site ID #: 5045747

Site scored/ranked for the February 2006 update

SITE DESCRIPTION (management areas, substances of concern, and quantities):

The subject site is owned by the Wenatchee School District and is occupied by the elementary school facility. The school yard consists of several play areas, landscaped grounds, and parking/access areas. Play yards are generally well-maintained, with grass cover, wood chips, gravel, or other barriers to native soil.

HISTORICAL BACKGROUND--INFO

The property where Lewis and Clark Elementary School is located was previously used as orchard land for many years. Prior to the mid 1940's, lead arsenate was the most widely used chemical sprayed on fruit trees to control insect pests. Lead (Pb) and arsenic (As) are known to be very stable in soil and tend to stay near the surface. Because of this historical background, it was suspected that the soil in the school playground might be contaminated with Pb and As. In 2002 the Washington State Department of Ecology (Ecology) obtained permission from the Wenatchee School District to sample and test the soils for Pb and As from all of the Wenatchee area school playgrounds.

The soils throughout the property were sampled by Krystal Rodriguez from Ecology on July 3, 2002, and samples were analyzed for Pb and As. Samples were taken from the top 6 inches using a core sampler. The samples were analyzed using Inductively Coupled Plasma Spectrometry (ICP) by AmTest laboratory in Redmond, Washington.

Of the 30 soil samples analyzed for Pb and As, concentrations exceeded Model Toxics Control Act (MTCA) Method A cleanup levels for Unrestricted Land Use for Pb (250 mg/kg) in eight of the samples and for As (20 mg/kg) in fifteen of the samples. The highest Pb concentration was 600 mg/kg, while the highest As concentration was 100 mg/kg (see enclosed data table and site map).

ROUTE SCORES:

Surface Water/Human Health:	<u>9.0</u>	Surface Water/Environmental.:	<u>12.6</u>
Air/Human Health:	<u>23.4</u>	Air/Environmental:	<u>NS</u>
Groundwater/Human Health:	<u>24.3</u>		

OVERALL RANK: 4

WORKSHEET 2
Route Documentation

1. SURFACE WATER ROUTE

- a. List those substances to be considered for scoring: Source: 1,2
Arsenic, lead
- b. Explain basis for choice of substance(s) to be used in scoring.
Soil sample analysis—As and Pb were found above MTCA Level A.
- c. List those management units to be considered for scoring: Source 1,2
Contaminated on-site surface and subsurface soils.
- d. Explain basis for choice of unit to be used in scoring:
As and Pb contamination confirmed by laboratory testing.

2. AIR ROUTE

- a. List those substances to be considered for scoring: Source: 1,2
Arsenic, lead.
- b. Explain basis for choice of substance(s) to be used in scoring:
Soil sample analysis—As and Pb were found above MTCA Level A
- c. List those management units to be considered for scoring: Source: 1,2
Contaminated on-site surface and subsurface soils.
- d. Explain basis for choice of unit to be used in scoring:
As and Pb contamination confirmed by laboratory testing.

3. GROUNDWATER ROUTE

- a. List those substances to be considered for scoring: Source: 1,2
Arsenic, lead.
- b. Explain basis for choice of substance(s) to be used in scoring:
Soil sample analysis—As and Pb were found above MTCA Level A
- c. List those management units to be considered for scoring: Source: 1,2
Contaminated on-site surface and subsurface soils.
- d. Explain basis for choice of unit to be used in scoring:
As and Pb contamination confirmed by laboratory testing.

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	Arsenic	10	8	763 (rat)	5	0.001	5	A	1.75	7
2	Lead	5	8	ND	-	<0.001	10	B2	ND	-
3										
4										
5										
6										

**Potency Factor*

Source: 1,2,5
Highest Value: 10
 (Max = 10)
Plus 2 Bonus Points? 2
Final Toxicity Value: 12
 (Max = 12)

1.2 Environmental Toxicity					
Substance			Acute Water Quality Criteria		Non-Human Mammalian Acute Toxicity
			(µg/L)	Value	(mg/kg) Value
1	Arsenic		360	4	
2	Lead		82	6	
3					

Source: 1,2,5
Highest Value: 6
 (Max = 10)

1.3 Substance Quantity	
Explain Basis: Estimated 9 acres	Source: <u>1,6</u> Value: 9 (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	Containment: Management unit scored as a spills/discharges/contaminated soil at the surface, with ineffectively maintained run-on/run-off controls (vegetated buffer)	1,6	4 (Max = 10)
2.2	Surface Soil Permeability: sand, gravel, sandy loam	1,3,6	1 (Max = 7)
2.3	Total Annual Precipitation: 10.1 inches	7	1 (Max = 5)
2.4	Max 2yr/24hr Precipitation: 1.5 inches	6	2 (Max = 5)
2.5	Flood Plain: Not in flood plain		0 (Max = 2)
2.6	Terrain Slope: Area surrounding school is piped and culverted	1,6	3 (Max = 5)

3.0 TARGETS

		Source	Value
3.1	Distance to Surface Water: Distance to Columbia River estimated 4500 ft.	10	4 (Max = 10)
3.2	Population Served within 2 miles: No downstream water intakes within 2 miles; therefore population = 0.	4,8,10	0 (Max = 75)
3.3	Area Irrigated within 2 miles : $(0.75) \times \sqrt{214} \text{ acres} = 10.9$	8	11 (Max = 30)
3.4	Distance to Nearest Fishery Resource: See 3.1	10	6 (Max = 12)
3.5	Distance to, and Name(s) of, Nearest Sensitive Environment(s): Distance to Columbia River estimated 4500 ft.	10	6 (Max = 12)

4.0 RELEASE

Explain Basis: None documented by analytical evidence.	Source: <u>1</u> Value: <u>0</u> (Max = 5)
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WORKSHEET 5

Air Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 Introduction (WARM Scoring Manual)

1.2 Human Toxicity										
	Substance	Air Standard ($\mu\text{g}/\text{m}^3$)	Value	Acute Toxicity (mg/m^3)	Value	Chronic Toxicity ($\text{mg}/\text{kg}/\text{day}$)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Arsenic	0.00023	10	ND	-	ND	-	A	50	9
2	Lead	0.5	10	ND	-	ND	-	B2	ND	-
3										
4										
5										
6										

* Potency Factor

Source: 1,2,5

Highest Value: 10

(Max = 10)

Plus 2 Bonus Points? 2

Final Toxicity Value: 12

(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		Sandy loam	86	10-30
2				
3				
4				
5				
6				

Source:

Value:

(Max = 4)

Source: 3,6

Value: 2

(Max = 4)

1.4 Highest Human Health Toxicity/ Mobility Matrix Value (from Table A-7)

Final Matrix Value: 12

(Max = 24)

1.5 Environmental Toxicity/Mobility						
Substance		Non-human Mammalian Inhalation Toxicity (mg/m ³)	Acute Value	Mobility (mmHg)	Value	Matrix Value
1	Arsenic	ND	--	ND	--	--
2	Lead	ND	--	ND	--	--
3						
4						

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

1.6 Substance Quantity	
Explain Basis: Estimated 9 acres	Source: <u>1,6</u> Value: 8 (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	Containment: Uncontaminated soil cover < 2 feet thick	1,6	5 (Max = 10)

3.0 TARGETS

		Source	Value
3.1	Nearest Population: Less than 1000 feet to school	1,2	10 (Max = 10)
3.2	Distance to [and name(s) of] nearest sensitive environment(s): Less than 1000 feet to municipal park	10	7 (Max = 7)
3.3	Population served within 0.5 miles: $\sqrt{3408} = 58.4$	6,11	58 (Max = 75)

4.0 RELEASE

Explain Basis for scoring a release to air: None documented	Source: <u>1,6</u> Value: 0 (Max = 5)
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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	Arsenic	10	8	763(rat)	5	0.001	5	A	1.75	7
2	Lead	5	8	ND	--	<0.001	10	B2	ND	--
3										
4										
5										
6										

* Potency Factor

Source: 1,2,5

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		Solubility (mg/L)
1= 3	OR	1=
2= 2		2=
3=		3=
4=		4=

Source: 2,5

Value: 3

(Max = 3)

1.3 Substance Quantity:	
Explain basis: 9 acres X 43,560 sq ft/acres/9 = 43,560 cu yds	Source: <u>1,6</u> Value: <u>9</u> (Max=10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	Containment (explain basis): Contaminated soil, no cap	1,6	10 (Max = 10)
2.2	Net precipitation: 5.7 minus 3.0 = 2.7 inches	7	1 (Max = 5)
2.3	Subsurface hydraulic conductivity: silty sand	1,3,6	3 (Max = 4)
2.4	Vertical depth to groundwater: 50-100 feet	4,6	4 (Max = 8)

3.0 TARGETS

		Source	Value
3.1	Groundwater usage: Public supply, alternate sources available	8,9	4 (Max = 10)
3.2	Distance to nearest drinking water well: >10,000 feet	4	0 (Max = 5)
3.3	Population served within 2 miles: public water source >2 miles away	8,9	0 (Max = 100)
3.4	Area irrigated by (groundwater) wells within 2 miles: (0.75)*√ 248 acres = 11.8	6,8	12 (Max = 50)

4.0 RELEASE

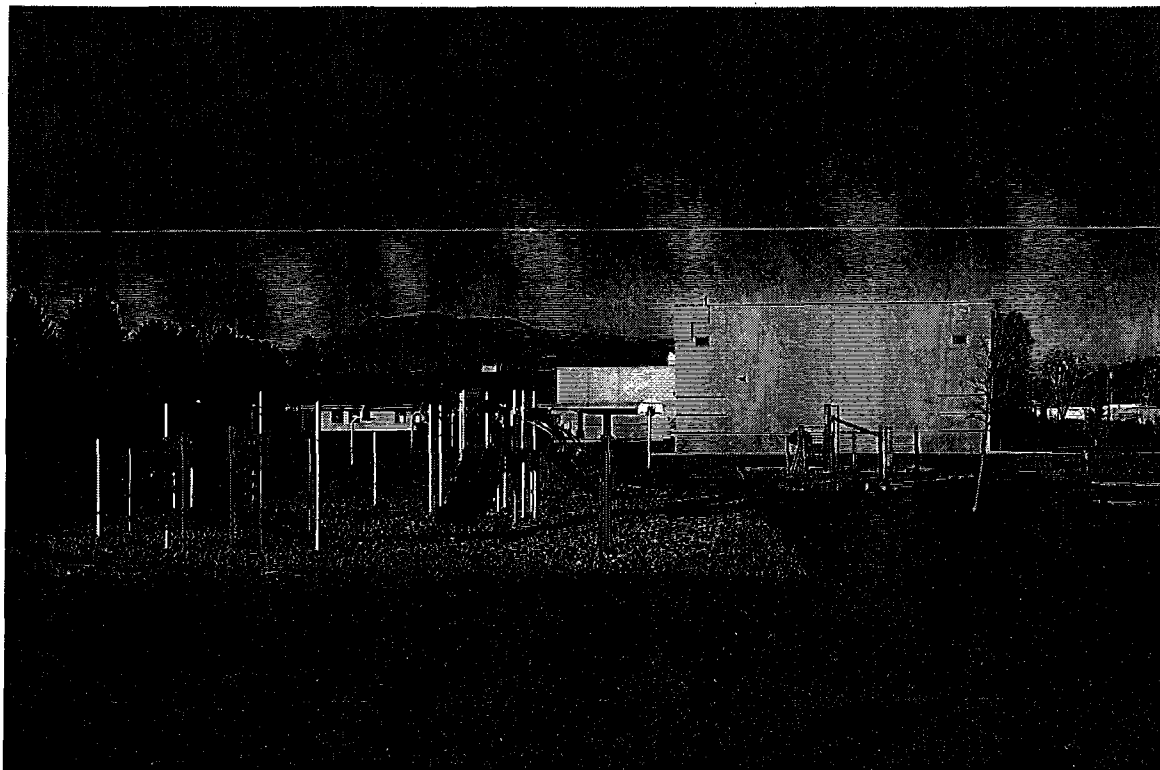
		Source	Value
	Explain basis for scoring a release to groundwater: No documentation	1,6	0 (Max = 5)

SOURCES USED IN SCORING

1. Soil sampling by Ecology CRO staff July 3, 2002.
2. Soil sample analysis reports summary from CRO staff.
3. Soil logs on file at Chelan-Douglas Health District.
4. Washington Department of Ecology well log website (<http://apps.ecy.wa.gov/wellog>)
5. Washington Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992.
6. Washington Department of Ecology, WARM Scoring Manual, April 1992.
7. Washington Climate – Net Rainfall (Table 27)
8. Water Rights Application Tracking System (WRATS) printout for two-mile radius of site.
9. Washington State Department of Health, SENTRY Database printout for public water supplies
10. Chelan County map (Published by Chelan County Public Works)
11. Topographic map from Windows Live Local (<http://local.live.com/>)



School entrance on east side



Playground and view from south



View of school from west



View of park looking north from school