

WEST SIDE HIGH SCHOOL FINAL SHA REPORT FEBRUARY 17, 2006

WORKSHEET 1
Summary Score Sheet

SITE INFORMATION:

Name: West Side High School
Address: 1521 9th St.
City: Wenatchee County: Chelan State: WA Zip: 98801
Section/Township/Range: T23N R20E S33
Latitude: 47° 25' 54" Longitude: 120° 20' 24"
Facility Site ID #: 4267507

Site scored/ranked for the February 22, 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 high school facility. The school yard south of the school consists of a large grass playing field. North of the school is a large paved parking area. The playing field is generally well-maintained with a good grass cover.

HISTORICAL BACKGROUND--INFO

The property where West Side High 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 August 22, 2002, and samples were analyzed for Pb and As. Samples were taken from the top six inches using a core sampler. The samples were analyzed using Inductively Coupled Plasma Spectrometry (ICP) by Cascade Analytical, Inc. of Wenatchee, WA.

Of the seven soil samples analyzed for Pb and As, concentrations exceeded Model Toxics Control Act (MTCA) Method A cleanup levels for Unrestricted Land Use for As (20 mg/kg) in five of the samples. The highest Pb concentration was 174 mg/kg, while the highest As concentration was 67 mg/kg (see enclosed data table and site map). Although none of the sample Pb results exceeded the MTCA Method A cleanup level of 250 mg/kg, all of the samples were significantly higher than the natural background level for Pb in Washington state of 17 mg/kg (reference source #12). Because of this both Pb and As will be used in scoring this site.

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ROUTE SCORES:

Surface Water/Human Health:	7.8	Surface Water/Environmental.:	8.3
Air/Human Health:	19.9	Air/Environmental:	<u>NS</u>
Groundwater/Human Health:	28.9		

OVERALL RANK: 5

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 was found above MTCA Level A,
 Pb was found at levels much higher than natural background.
- 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 was found above MTCA Level A,
 Pb was found at levels much higher than natural background.
- 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 was found above MTCA Level A
 Pb was found at levels much higher than natural background.
- 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 1.4 acres	Source: <u>1,6</u> Value: 8 (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 6000 ft.	10	2 (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 : $(0.75)*\sqrt{126}$ acres = 8.4	8	8 (Max = 30)
3.4	Distance to Nearest Fishery Resource: See 3.1	10	3 (Max = 12)
3.5	Distance to, and Name(s) of, Nearest Sensitive Environment(s): Distance to Columbia River estimated 6000 ft.	10	3 (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 1.4 acres	Source: 1,6 Value: 6 (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): Approximately 2800 feet to municipal park	5	7 (Max = 7)
3.3	Population served within 0.5 miles: $\sqrt{2388} = 48.9$	6,11	49 (Max = 75)

4.0 RELEASE

Explain Basis for scoring a release to air:	Source: 1,6 Value: 0 (Max = 5)
None documented	

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:	
<p>Explain basis:</p> <p>1.4 acres X 43,560 sq ft/acres/9 = 6776 cu yds</p>	<p>Source: <u>1,6</u></p> <p>Value: 5</p> <p>(Max=10)</p>

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: <25-50 feet	4,6	6 (Max = 8)

3.0 TARGETS

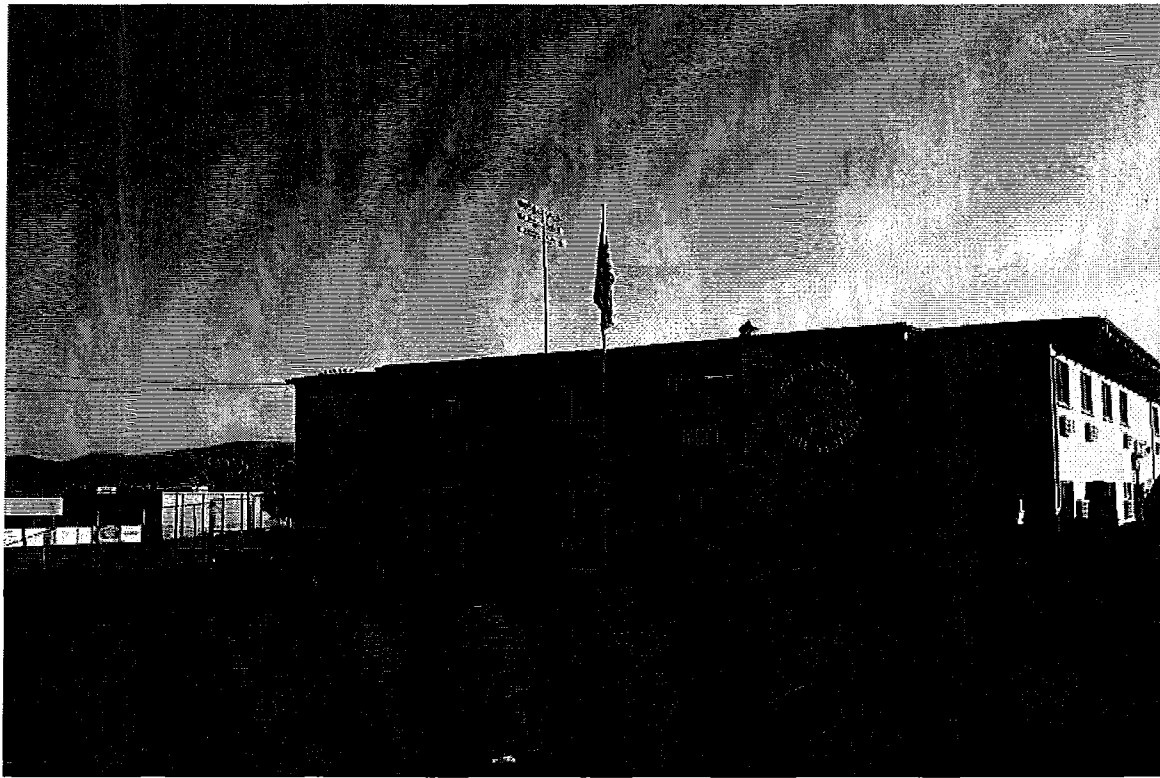
		Source	Value
3.1	Groundwater usage: Public supply, alternate sources available	8,9	4 (Max = 10)
3.2	Distance to nearest drinking water well: <u>>10,000</u> feet	4	0 (Max = 5)
3.3	Population served within 2 miles: public water source >2 miles away	8,9	0 (Max = 100)
3.4	Area irrigated by (groundwater) wells within 2 miles: (0.75)*√ 323 acres = 13.4	6,8	13 (Max = 50)

4.0 RELEASE

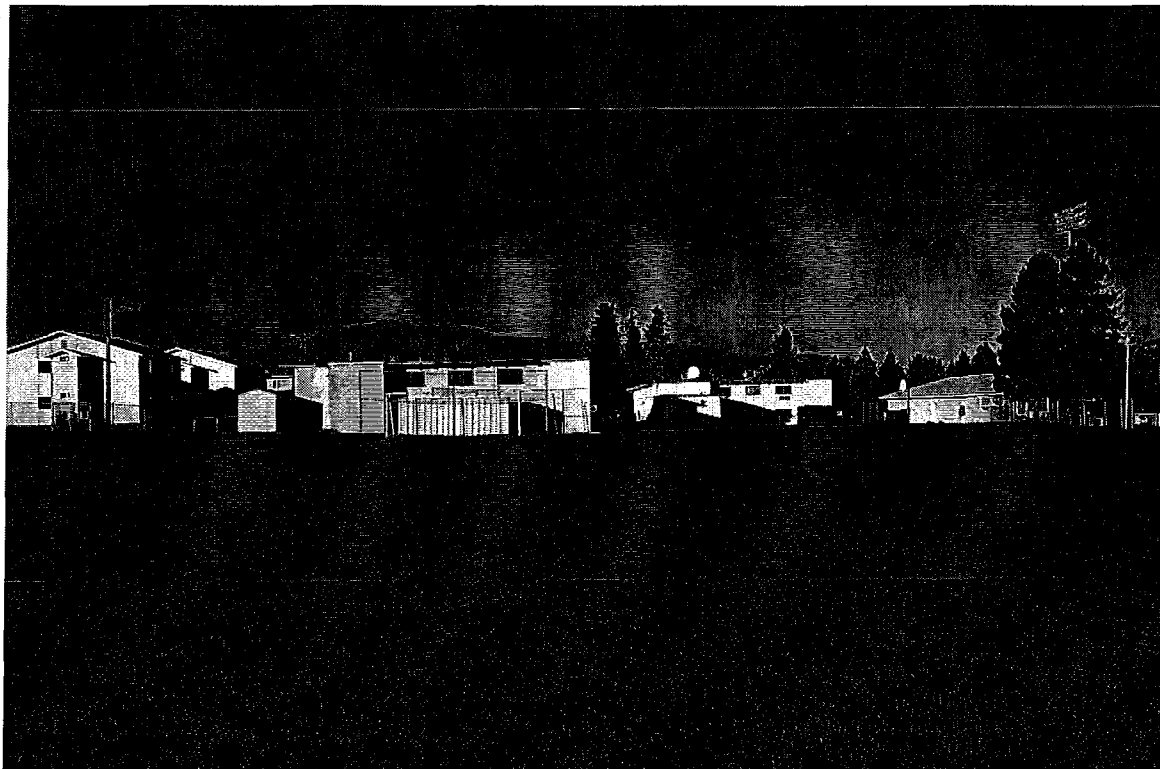
		Source	Value
	Explain basis for scoring a release to groundwater: No documentation	1,6	0 (Max = 5)

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/>)
12. Natural Background Soil Metals Concentrations in Washington State, Ecology Publication #94-115, October, 1994

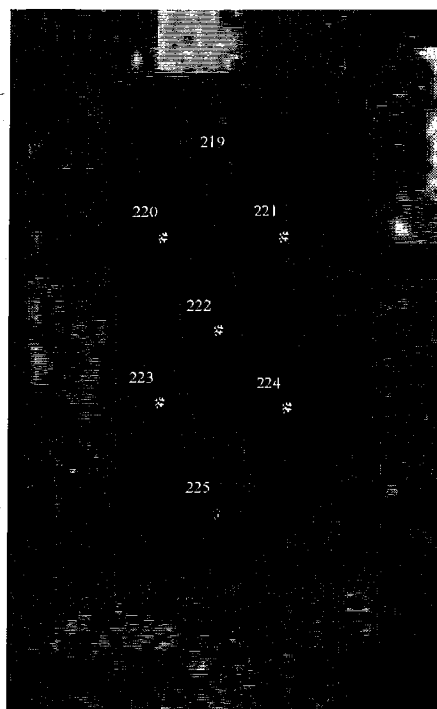


View from north November 17, 2005

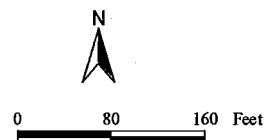


View from south November 17, 2005

WESTSIDE HIGH SCHOOL



Sample Analysis Method
 o Field Only
 s Lab and Field
 Arsenic Levels (ppm)
 * < 20
 s 20-100



Prepared by K. Rodriguez
 Dept. of Ecology
 October 24 2002

Sample ID	Lead (mg/kg)	Arsenic (mg/kg)
219	74.3*	18.3*
220	94.8	36.00
221	174.0	66.98
222	129.0	37.25
223	39.5	25.5
224	102.0	57.5
225	74.3*	18.3*
MTCA Method A Level	250	20

*Result obtained during field analysis