WORKSHEET 1
Summary Score Sheet

SITE INFORMATION:

Name: **Holcim (US) Inc.**
Address: **12207 East Empire Way**
City: **Spokane Valley** County: **Spokane** State: **WA** Zip: **99206**
Section/Township/Range:**E1/2 Section 4, Township 25, Range 44 EWM**

Latitude: **47° - 41' - 33"**
Longitude: **117° - 14' - 40"**

TCP ID #: **52126416**

Site scored/ranked for the August 2009 update.

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

The Holcim (US) Inc. site consists of 21.5 acres located within the incorporated boundary of Spokane Valley, Spokane, Washington. Located at 12207 East Empire Way north of Pines Road it is bordered by single and multi-family development to the west; light industrial and commercial properties to the south, and public lands (Centennial Trail) and the Spokane River to the north and east.

The subject property was developed and operated as a cement manufacturing plant from 1910 through 1967 and later utilized as a cement distribution terminal from 1967 until 2002. Several structures were located at the subject property including a mill and kiln, office and laboratory, coal storage buildings, machines shop, truck wash and various other structures associated with cement production. Additionally railroad spur lines entered the site and by 2006 all structures were demolished on the site.

Environmental reviews of historical activity disclosed the land filling of cement kiln dust (CKD) within the subject property and north of the site (deposited from about the mid 1950's to 1967). Estimated thickness of the CKD fill has been reported to range from 10 to 25 feet below ground surface (bgs) on the subject property and from 2 to 10 feet north of the property. CKD is exposed at the surface and is subject to surface runoff and airborne distribution.

Site contamination was disclosed during a preliminary investigation for a proposed sewer line easement. CKD deposits disclosed metals contamination exceeding MTCA Method A levels for unrestricted land use. Contaminants of concern (COC's) revealed within the site were Arsenic (ranging from 22.1 to 44.3 mg/kg.); Cadmium (ranging from 2.2 to 8.41 mg/kg) and Lead (ranging from 256 to 1,760 mg/kg). Contamination associated with CKD north of the site ranged from 41.5 to 86.9 mg/kg for Arsenic, 3.68 to 8.28 mg/kg for Cadmium, and 297 to 1,070 mg/kg for Lead. Additional site contamination including Benzene, Gasoline Range Petroleum Hydrocarbon, and cPAH's that exceeded MTCA Method A levels for unrestricted land use. This was reported as limited to one sample area proximate to a former coal storage area. It was noted that the lateral and vertical

extent of this contamination was unknown but assumed on visual observation that this contamination was limited to the one sample location.
Groundwater samples were collected from on-site monitoring wells and were analyzed for total metals. Arsenic and Lead concentrations exceeded applicable cleanup criteria. Off site control sampling and river water sampling was conducted and displayed analogous results. A hypothesis was expressed in the site assessment report that these COC's do not appear to leach into the groundwater and that the elevated levels are possibly naturally occurring as adhering to clay sized particles. For the purposes of this site hazard assessment this condition will be scored as a release to groundwater on the basis that the COC's are present on-site and north of the subject property in high concentrations associated with the land filled CKD.

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):

None.

ROUTE SCORES:

Surface Water/Human Health:	**19.97**	Surface Water/Environmental.:	**56.19**
Air/Human Health:	**17.62**	Air/Environmental:	**NS**
Groundwater/Human Health:	**60.57**		

OVERALL RANK: 1.

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE**

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

   Arsenic, Cadmium, Lead

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

   Contaminants of concern (COC's) exceed MTCA Method A Unrestricted Land Use and are exposed at ground surface and are located within 300 feet up gradient from the Spokane River.

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

   Surface, Surface drainages, porous subsurface soils and groundwater

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

   The COC's are exposed at ground surface and are located within 300 feet up gradient from the Spokane River

2. **AIR ROUTE**

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

   Arsenic, Cadmium, Lead

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

   Contaminants of concern (COC's) exceed MTCA Method A Unrestricted Land Use and are exposed at ground surface.

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

   Surface, Surface drainages, porous subsurface soils and groundwater

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

   Contaminants of concern (COC's) exceed MTCA Method A Unrestricted Land Use and are exposed at ground surface.

3. **GROUNDWATER ROUTE**

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

Arsenic, Cadmium, Lead, Benzene, and cPAH's

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

Contaminants of Concern exceed MTCA Method A Unrestricted Land Use in surface and subsurface soils. Analytical indications of COC's (Metals) exceeding MTCA Method A Unrestricted Land Use displayed in groundwater samples from site monitoring wells

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

Surface, Surface drainages, porous subsurface soils and groundwater

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

Analytical results of subsurface soil samples revealed contaminant concentrations of Arsenic, Cadmium, Lead, Benzene and cPAH's exceed the Washington State Model Toxics Control Act (MTCA) Method A soil cleanup levels for unrestricted land use.

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	Cadmium	5	8	225(rat)	5	0.0005	5	ND	ND	ND
3	Lead	5	8	NA	ND	0.001	10	ND	ND	ND

Potency Factor

Source: **2, 3**

Highest Value:10
(Max = 10)

Plus 2 Bonus Points? YES

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	ND	ND
2	Cadmium	3.9	8	ND	ND
3	Lead	82	6	ND	ND

Source: **2, 3**

Highest Value:8
(Max = 10)

1.3 Substance Quantity (aerial extent)

Explain Basis: Surface area estimate derived from site assessment report (GeoEngineers). Aerial photos of exposed CKD figure 8 and contamination sample locations figure 5 with depths reported in site report. Estimation exceeds 52,000 cubic yards

Source: **1a. 3**
Value: 10
(Max = 10)

MIGRATION POTENTIAL

		Source	Value
2.1	**Containment:** Management unit scored as spills/discharges/contaminated soil at the surface, with no run-on/run off controls or unknown controls **Explain basis:** Contaminant (Cement Kiln Dust) displays surface water erosion and migration during site inspection.	**1A. 3**	**10** (Max = 10)
2.2	**Surface Soil Permeability:** The site consist of Garrison Gravelly loam	**5**	**1** (Max = 7)
2.3	**Total Annual Precipitation:** The average annual precipitation for this location in Spokane Washington is 14 inches	**4**	**2** (Max = 5)
2.4	**Max 2yr/24hr Precipitation:** Max precipitation for this location in Spokane Washington is 1.5 inches	**4**	**2** (Max = 5)
2.5	**Flood Plain:** The north of the site CKD is located in a 100 year flood plain	**10**	**2** (Max = 2)
2.6	**Terrain Slope:** Variable at 2% to 5%	**1A. 11**	**2** (Max = 5)

2.0 TARGETS

		Source	Value
3.1	**Distance to Surface Water:** < 1,000 feet	**10, 11**	**10** (Max = 10)
3.2	**Population Served within 2 miles (see WARM Scoring Manual Regarding Direction):** Not Applicable	**3**	**0** (Max = 75)
3.3	**Area Irrigated by surface water within 2 miles : (0.75)*√ # acres =** Not Applicable	**3**	**0** (Max = 30)
3.4	**Distance to Nearest Fishery Resource:** < 1,000 feet	**11**	**12** (Max = 12)
3.5	**Distance to, and Name(s) of, Nearest Sensitive Environment(s):** < 1,000	**11**	**12** (Max = 12)

3.0 RELEASE

Explain Basis: Not Documented	Source: **1a. 3** **Value: 0** (Max = 5)

WORKSHEET 5
Air Route

1.0 SUBSTANCE CHARACTERISTICS

1.1. Introduction

1.2 Human Toxicity

	Substance	Air Standard ($\mu g/m^3$)	Value	Acute Toxicity (mg/m^3)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Arsenic	0.00023	10	ND	--	0.001	10	A	50	9
2	Cadmium	0.00056	10	25(rat)	10	--	ND	B1	6.1	6
3	Lead	0.5	10	ND	--	0.001	10	B2	ND	--

** Potency Factor*

Source: **2, 3**

Highest Value: 10
(Max = 10)

Plus 2 Bonus Points? Yes

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		GgA (sandy loam)	86	1-10

Source: NA

Value: NS
(Max = 4)

Source: **3**

Value: 1
(Max = 4)

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

Final Matrix Value:6
(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	Cadmium	ND	--	ND	--	--
3	Lead	ND	--	ND	--	--

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

1.6 Substance Quantity (aerial extent)	
Explain Basis: Surface area estimate derived from site assessment report (GeoEngineers). Aerial photos of exposed CKD figure 8 and contamination sample locations figure 5 estimation of surface area at 220,000 square feet	Source: **1a. 3** **Value: 7** (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment:** No cover spilled directly onto ground surface	**3**	**10** (Max = 10)

3.0 TARGETS

		Source	Value
3.1	**Nearest Population:** ≤ 1,000 ft.	**12**	**10** (Max = 10)
3.2	**Distance to [and name(s) of] nearest sensitive environment(s) [fisheries excluded: State Park Centennial Trail**	**11**	**7** (Max = 7)
3.3	**Population served within 0.5 miles:** √ **pop.** =√1128 = 33.58 2000 census data	**12**	**34** (Max = 75)

4.0 RELEASE

Explain Basis for scoring a release to air: No confirmed release under current conditions	Source: **3** **Value: 0** (Max = 5)

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	Cadmium	5	8	225	5	0.0005	5	ND	ND	ND
3	Lead	5	8	NA	ND	0.001	10	ND	ND	ND
4	Benzene	5	8	3306	3	NA	ND	A	.029	5
5	.cPAH as Chrysene	0.2	10	NA	ND	NA	ND	B2	11.5	7

** Potency Factor*

Source: **1a. 3**

Highest Value: 10
(Max = 10)

Plus 2 Bonus Points? Yes

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= Arsenic K >1.0 = value 3	1= Benzene 1.8E+03 value 3
2= Cadmium K >1.0 = value 3	2= Chrysene1.8E-03 value 0
3= Lead K0.1 to 1.0 = value 2	

Source: **3**

Value: 3
(Max = 3)

1.3 Substance Quantity (volume):

Estimation exceeds 52,000 Explain basis: Surface area estimate derived from site assessment report (GeoEngineers). Aerial photos of exposed CKD figure 8 and contamination sample locations figure 5 with depths reported in site report. Estimation exceeds 52,000 cubic yards	Source:**1a. 3** **Value: 10** (Max=10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment** Management unit scored as spills/discharges/contaminated soil at the surface, with no run-on/run off controls or unknown controls **(explain basis):** Cement Kiln Dust land filled to various depths and is exposed to the surface w/o liner cover or collection. Benzene and cPAH's are limited but categorized as spills/discharges/contaminated soil	**1A. 3**	**10** (Max = 10)
2.2	**Net precipitation:** >0.1 - 10	**4**	**1** (Max = 5)
2.3	**Subsurface hydraulic conductivity:** Garrison Gravelly Loam $>10^{-5}$ - 10^{-3}	**5**	**3** (Max = 4)
2.4	**Vertical depth to groundwater:** >25 – 50 feet (Note contaminated fill north of the subject property is estimated to be < 25 feet to groundwater	**1A. 3**	**6** (Max = 8)

3.0 TARGETS

		Source	Value
3.1	**Groundwater usage: Federally designated sole source aquifer**	**7**	**10** (Max = 10)
3.2	**Distance to nearest drinking water well:** < 600 feet Irvin Water district	**6, 8**	**5** (Max = 5)
3.3	**Population served within 2 miles: √ pop.** = √3,500 = 59	**8**	**59** (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles: (0.75)*√# acres = √ 2000 =44.74**	**9**	**45** (Max = 50)

4.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: Not Scored. Public water well test do not display a release, Contaminant horizon not shown to interface with existing groundwater	**1a. 3**	**0** (Max = 5)

SOURCES USED IN SCORING

1a. Site Assessment Report – Former Cement Manufacturing Plant
Holcim Property
Spokane Valley, Washington
March 21, 2008
GeoEngineers file No. 16316-001-00

1b. Follow-up Report Re: Holcim (US) Inc.

2. Toxicology Database WARM

3. WARM Scoring Manual

4. Washington Climate, Spokane Co. WSU Dept. of Agriculture

5. Soil Survey of Spokane Co. Washington, USDA Soil Conservation Svc.

6. Washington Department of Ecology Well Logs

7. Aquifer Sensitive Area Overlay Zone Map, Spokane Co. Washington

8. Washington Dept. of Health, Drinking Water Information Network

9. Water Rights Application Tracking System (WRATS) Ecology

10. FEMA Flood Insurance Maps

11. Quadrangle Maps of Washington, NE Spokane Regional Health District

12. Spokane County Census Information