SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

SITE INFORMATION:

Cleanup Site ID: 18

Ash Grove Cement West Inc.

Facility/Site ID: 2142

3801 E Marginal Way S

Seattle, King County, WA 98134

Section:	18	Latitude:	47.56813
Township:	24N	Longitude:	-122.34065
Range:	4E	Tax/Parcel ID:	766670-0350, 766670-0395

Site scored/ranked for the Hazardous Sites List Publication: August 2016

SITE DESCRIPTION:

The Ash Grove Cement West Inc. site (Site) is a former and current cement manufacturing facility located in Seattle, King County, Washington. The 23.5-acre property is located approximately 100 feet from the Lower Duwamish Waterway (LDW), and zoned for general to heavy industrial (IG1 U/85) use.

Adjacent properties include the Port of Seattle (POS) Terminal 104 to the north, the Alaskan Way Viaduct and East Marginal Way to the east, the POS Terminal 106W to the south, and the Lower Duwamish Waterway to the west. Stoneway Concrete, a ready-mix concrete plant, leases a 2.2-acre parcel at the east end of the Site from Ash Grove Cement.

The Site is currently operated as cement manufacturing facility by Ash Grove Cement.

Cement is manufactured using a dry method for producing clinker in a rotary kiln. Raw materials are transported to the facility by truck, rail, and barge and stored onsite both outdoors and indoors.

The Site is located southwest of the intersection of East Marginal Way and Southwest Klickitat Way on the east bank of the Lower Duwamish River at river mile 0.1. The site is almost entirely paved or covered by buildings. Several structures are present at the site for raw and finished material storage, processing and material management equipment and structures, maintenance buildings, offices, and miscellaneous smaller structures.

Stormwater at the site is managed under an individual Industrial National Pollutant Discharge Elimination System (NPDES) permit (WA0032221). The stormwater system includes numerous catch basins throughout the site. Stormwater from the central portion of the site drains to a sump where it is used as process water, with excess pumped to the sanitary sewer. Other site stormwater is conveyed to a retention structure and then to the City of Seattle's South Hind Street stormwater system in East Marginal Way with eventual discharge to the East Waterway. Stormwater treatment includes an oil/water separator. In January 2014 a Chitosan Enhanced Sand Filtration treatment system was constructed at the Site.

The site has historically operated under a Title V Air Operating Permit and has had a number of violations related to fugitive dust and air emissions from the facility.

Two groundwater production wells are located at the Site for industrial water use. Certificate of Water Right number G1-26221C with a priority date of Mary 31, 1991 allocates up to 37.1 acre-feet of year withdrawl. It is unknown whether these two wells are actively being used at the Site.

SITE BACKGROUND:

A summary of prior operations/tenants at the subject property is presented below.

From	To	Operator/Tenant	Activity

1928	1934	Pacific Coast Cement Company	Cement Manufacturing
1934	1946	Superior Portland Cement Company	Cement Manufacturing
1946	1949	Kaiser Cement Company	Cement Manufacturing
1949	1956	Superior Portland Cement Company	Cement Manufacturing
1956	1984	Lone Star Industries/Cement Company	Cement Manufacturing
1984	1991	Ash Grove Cement West	Cement Manufacturing
1991	2016	Ash Grove Cement Company	Cement Manufacturing

SITE CONTAMINATION:

In 1998 the Ash Grove Cement West Inc. site was reported to Washington State Department of Ecology (Ecology) and placed on the Confirmed and Suspected Contaminated Sites List (CSCSL).

The Site has been used for cement manufacturing since approximately 1920 by a series of owners and operators prior to Ash Grove Cement. Historic activities are described in further detail in the 2008 Summary of Existing Information and Identification of Data Gaps Report (Ecology and Environment 2008). Several known and suspected prior releases have been identified at the Site based on prior operations and remediation activities. Potential sources of soil, groundwater and surface water contamination include historic underground storage tanks (USTs), chemical spills, polychlorinated biphenyl (PCB)-containing transformers or other equipment, and historic wastewater handling practices.

From 1973 until approximately 1990, process wastewater was discharged to a settlling pond located on the southwest corner of the Site. The facility was first permitted in 1964 to discharge cooling wanter and wastewater by infiltration or discharge to the LDW. The pond was dredged at least once in 1987 prior to backfilling and paving the area in 1991 or 1992. It is unknown how much pond sediment was excavated and removed from the Site prior to regrading. There are no records of characterization of the soil or groundwater beneath the pond. Sediment samples were reportedly collected prior to dredging of the pond. A pond sediment sample (it is unknown if this was from dredged material or the base of the pond excavation) contained arsenic at a concentration of 78 milligrams per kilogram (mg/kg), cadmium (5 mg/kg), copper (120 mg/kg), total chromium (64 mg/kg), lead (710 mg/kg), and zinc (450 mg/kg). A December 1983 water sample collected from the pond contained chromium at a concentration 0f 0.35 milligrams per liter (mg/L).

Following closure of the discharge pond in 1991, process wastewater and stormwater was thought to discharge to the combined sewer . An inspection of the Ash Grove Cement facility conducted by Ecology and Seattle Public Utilities (SPU) on 14 January 2009 found that stormwater from the facility discharges to the East Waterway via the South Hinds Street storm drain.

REMEDIATION ACTIVITIES:

Other areas of potential contamination and prior remediation activities have been identified at the Site. Reportedly, a number of facility improvements were made from the mid-1980s through the early-1990s following the acquisition by Ash Grove Cement West/Ash Grove Cement Company.

The cement manufacturing process at the facility was "wet" prior to 1984 (Ecology and Environment 1987). Between 1984 and 1989 the clinker kiln was shown down and clinker was imported to the facility. In 1989 the "dry process" was initiated and a new clinker kiln came online. Spent chrome-bonded bricks used to line the older clinker kiln were reportedly disposed onsite prior to 1981, and re-used in the manufacturing process from 1981 through 1984. In a telephone call, Lone Star Industries indicated that the high chromium concentration (0.35 mg/L) in water from the settling pond in December 1983 may be related to onsite disposal of the chrome-bonded bricks.

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In October 1985 two USTs were reportedly removed, and two additional USTs were removed in April 1986. The locations and contents of the former tanks are unknown, and it is unknown whether confirmation soil or groundwater sampling was conducted during UST removal activities.

In 1986, 8.1 cubic yards of soil containing PCBs were removed from the kiln transformer area. At least five PCB-containing transformers were removed from the property and disposed in 1986, as were 30 gallons of PCB-containing transformer oil. No information was available regarding confirmation soil sampling following the PCB-impacted soil removal. Locations of the former PCB-containing transformers were not specified.

In 1993, two large holding tanks containing used oil were reportedly being present at the site. Ash Grove had approval to burn the used oil as a supplementary fuel source; however, they report this use was limited to testing and used oil was not used in the kiln process. It is unknown whether any releases of used oil have occurred at the facility.

A number of site inspections have been conducted by Ecology, the Environmental Protection Agency (EPA) and others. These inspections have been conducted for permitted activities, characterization and site activities related to the LDW Superfund site, LDW source control, and dangerous/hazardous waste or materials compliance.

Ash Grove contracted Anchor QEA to conduct groundwater sampling at five temporary well locations (AG-01 through AG-05) in December 2010. Portions of the groundwater sampling report were available for review, which indicated groundwater samples contained concentrations of PCBs (total and dissolved fractions) less than a 0.1 microgram per liter reporting limit.

CURRENT SITE CONDITIONS:

Groundwater and soil contamination is suspected at the site from historic operation of the discharge pond, historic wastewater discharge practices, former PCB-containing transformers, and historic USTs. Site characterization at a number of suspected release areas has not been reported, and limited information regarding groundwater conditions at the Site are available.

PCBs, metals and/or petroleum hydrocarbons are suspected to be present in groundwater; however, insufficient soil and groundwater data have been reported to Ecology to characterize current Site conditions.

The approximate depth to groundwater is 10 feet below ground surface, with groundwater flowing to the west (assumed based on site topography). Subsurface soils are expected to be silt, silty sand, and sand, based on boring logs reviewed in Ecology's files.

SPECIAL CONSIDERATIONS:

Checked boxes indicate routes applicable for Washington Ranking Method (WARM) scoring

☑ **Surface Water**

Contaminant releases likely occurred in the subsurface. Although the site is paved, surface water may be impacted through surfacewater/groundwater interaction and tidal influence.

☑ **Air**

Petroleum hydrocarbon-related volatile organic compounds may have been released to the subsurface from former USTs.

☑ **Groundwater**

Contaminated soil and groundwater is suspected at the site.

No confirmed releases to soil or groundwater have been reported. Characterization is needed to better evaluate risk. Scoring for groundwater and air routes were conducted under the assumption that impacts to soil and groundwater may be present. Route scores calculated for the Surface Water route reflect no empirically confirmed impact to groundwater.

SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

ROUTE SCORES:

Surface Water/ Human Health:	10.2	Surface Water/ Environment:	27.3
Air/ Human Health:	5.1	Air/ Environment:	1.4
Groundwater/ Human Health:	31.4		

Overall Rank: 4

REFERENCES:

1 AGI Technologies, 1996, Geotechnical Engineering Study, Proposed New Cement Storage, Seattle Cement Plant. December 16, 1996

2 Anchor QEA, 2012, Final Engineering Report, NPDES Permit No. WA-003222-1, Ash Grove Cement Company, Seattle Plant. Januray 2012.

3 Anchor QEA, 2014, Memorandum regarding Permit Implementation and Data Evaluation for Renewal. Prepared for Ash Grove Cement. Dated October 30, 2014.

4 Ash Grove Cement Company, 2015, Letter to Donna Musa (Ecology) regarding additional data and source documents for SHA preparation. From Curtis D Lesslie, dated August 14, 2015.

5 Ash Grove Cement Company. NPDES Discharge Monitoring Reports. Various dates.

6 Cascadia Law Group,2007, Written response to United States Environmental Protection Agency, Region 10 to Notice of Potential Liability Pursuant to Section 107(a) and Request for Information Pursuant to Section 104(e) of CERCLA, for the Lower Duwamish Waterway Superfund Site, Seattle Washington (the "Notice and Request for Information" or "RFI", 13 November 2007

7 City of Seattle, 2009, East Waterway South Hinds CSO/SD Storm Drain Basin IDDE Investigation Results (map). 2009.

8 City of Seattle, 2009, Letter to Ash Grove Cement Company, Results of Stormwater Pollution Prevention inspection, confirms that stormwater system discharges to the City storm line on East Marginal Way and ultimately the East Waterway of the Duwamish River. 11 February 2009.

9 Clayton Group Services, Inc., 2004, Spill Prevention Control and Countermeasures (SPCC) Plan, Ash Grove Cement Company. 16 March 2004.

10 Crowley Environmental Services, 1986, Letter to Ash Grove Cement Company. Transmittal of Hazardous Waste Manifests documenting disposal of 5 transformers, liquid from 3 other transformers, and 61 drums of contaminated soil from the kiln transformer area. 12 August 1986.

11 Ecology and Environment, 2008, Lower Duwamish Waterway River Mile 0.0-0.1 East (Spokane St. to Ash Grove Cement) Summary of Existing Information and Identification of Data Gaps Final Report. December.

12 King County Department of Assessments, 2015, http://info.kingcounty.gov/Assessor/eRealProperty/default.aspx, Assessors Parcel Information. Accessed August 2015.

13 Laucks Testing Laboratories, Inc., 1997, Plant Pond Sediment #1. 13 January 1997.

14 Lower Duwamish Waterway Group, 2007, Lower Duwamish Waterway Remedial Investigation Report, Draft prepared by Windward, LLC. 5 November 2007.

15 Missouri Census Data Center, 2014, Circular Area Profiles - 2010 census data around a point location. Http://mcdc.missouri.edu/websas/caps10c.html. Accessed March 2014.

16 United States Environmental Protection Agency, 1984, Potential Hazardous Waste Site Preliminary Assessment. 1 November 1984.

17 United States Environmental Protection Agency, 1994, Letter to Ash Grove Cement Company regarding completion of PCB inspection. Letter states no violations of PCB regulations were documented. 2 December 1994.

18 United States Environmental Protection Agency,1987, Letter to Ash Grove Cement Company, EPA does not anticipate further investgation under Superfund, based on a 20 November 1987 Site Inspection conducted by Ecology and Environment. 24 November 1987.

19 WARM Scoring Manual

20 WARM Toxicological Database

21 Washington Department of Ecology, 1983, State Waste Discharge Permit 35162 for Lone Star Cement for for discharge to groundwater and the Duwamish River through seepage through surge pond. Issued 17 January 1978, expired 17 January 1983.

22 Washington Department of Ecology, 1987, Letter to Ash Grove Cement West, Inc. Disposal of Pond Sediments Approval. 14 January 1987

23 Washington Department of Ecology, 1998, Letter to Ash Grove Cement Company, determination that no further action (NFA) was required based on a Site Hazard Assessment, 20 July 1998.

24 Washington Department of Ecology, 2009, Lower Duwamish Waterway River Mile 0.0-0.1 East (Spokane Street to Ash Grove Cement), Source Control Action Plan. June 2009.

25 Washington Department of Ecology, 2009, Warning Letter to Ash Grove Cement, Discharging Stormwater From an Industrial Activity without Authorization Under an NPDES Industrial Discharge Permit. 3 March 2009.

26 Washington Department of Ecology, 2010, National pollutant Discharge Elimination System Waste Discharge Permit No. WA-003222-1, issued April 30 2010, expires May 31 2015

27 Washington Department of Ecology, 2011, Site Briefing on Ash Grove Cement. Memorandum prepared by Donna Ortiz. 28 March 2011.

28 Washington Department of Ecology, 2012, letter to Ash Grove Cement approving the Ash Grove Cement Seattle Plant, Final Engineering Report, AKART Analysis, Anchor QEA, 23 January 2012.

29 Washington Department of Ecology, 2013, Lower Duwamish Waterway Source Control Status Report, January 2012 through December 2012. June 2013.

30 Washington Department of Ecology, 2015, Integrated Site Information System website: https://fortress.wa.gov/ecy/tcpwebreporting/TCPSubReportViewer.aspx?report=/TCP Reports/ISIS Web Reporting 2010/Public Reports/CleanupSiteDetails_p&subRptsiteID=18. August 2015.

31 Washington Department of Ecology, 2015, Well Log Search website: https://fortress.wa.gov/ecy/waterresources/map/WCLSWebMap/default.aspx, Accessed August 2015

SITE HAZARD ASSESSMENT
Worksheet 2
Route Documentation

Cleanup Site ID: 18 Ash Grove Cement West Inc.

Facility/Site ID: 2142

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

PCBs, metals, petroleum hydrocarbons

Explain the basis for choice of substances to be used in scoring:

Suspected release may impact surface water through surfacewater/groundwater interaction and tidal influence

List those management units to be considered for scoring:

Surface water

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

potential for impacts through surface water/groundwater interaction and tidal influence

2. AIR ROUTE

List those substances to be considered for scoring:

Petroleum hydrocarbons and related VOCs

Explain the basis for choice of substances to be used in scoring:

Suspected release

List those management units to be considered for scoring:

Soil and shallow groundwater

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

Release suspected from operation of USTs and piping

3. GROUNDWATER ROUTE

List those substances to be considered for scoring:

Petroleum hydrocarbons and related VOCs, metals

Explain the basis for choice of substances to be used in scoring:

Suspected release from USTs for PH, Metals concentrations exceed MTCA based on analytical data

List those management units to be considered for scoring:

Shallow groundwater

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

Release suspected from operation of USTs and piping and operation of settling pond.

Worksheet 4

Surface Water Route

CSID: 18 **Site Name:** Ash Grove Cement

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Arsenic	8	5	5	7
Lead	6	X	10	X
Cadmium	8	5	5	X
Chromium	6	X	1	X
Zinc	2	X	1	X
Copper	2	X	1	X
TPH as Gasoline	8	3	X	5
TPH as Diesel	4	5	3	X

Highest Value 10

Bonus Points? 2

Human Health Toxicity Value 12

1.2 Environmental Toxicity

Substance	Acute Water Quality Criteria		Non-human Mammalian Acute Toxicity	
	ug/L	Value	mg/kg	Value
Arsenic	69	6	763	5
Lead	140	4	X	X
Cadmium	43	6	225	5
Chromium	10300	2	X	X
Zinc	95	6	X	X
Copper	2.9	8	X	X
TPH as Gasoline	5100	2	3306	3
TPH as Diesel	2350	2	490	5

Environmental Toxicity Value 8

1.3 Substance Quantity

Amount: 8,000 square feet

Basis: Estimated surface area of impacted soils available to surface water ground. Impacted groundwater may also be present at the site and discharge to surface water

Substance Quantity Value 7

2.0 Migration Potential

2.1 Containment

Containment Value 4

Explain Basis: Spills or contaminated surface soils with unmaintained run-on/runoff control. Note, if impacts to groundwater are confirmed with empirical data, the Containment Value should be '10'

2.2 Surface Soil Permeability

Soil Permeability Value 3

silty sand mixture

2.3 Total Annual Precipitation — Total Precipitation Value: 3

37 inches

2.4 Max 2-yr/24-hour Precipitation — 2YR/24HR Precipitation Value: 3

2.4 inches

2.5 Floodplain — Floodplain Value: 0

Not in flood plain

2.6 Terrain Slope — Slope Value: 1

<2% grade

3.0 Targets

3.1 Distance to Surface Water — Surface Water Distance Value: 10

Site adjacent to Lower Duwamish Waterway

3.2 Population Served within 2 miles — Population Value: 0

0 people

3.3 Area Irrigated within 2 miles — Irrigation Value: 0

0 acres

3.4 Distance to Nearest Fishery Resource — Fishery Value: 12

<1000 feet to Lower Duwamish Waterway

3.5 Distance to and Name of Nearest Sensitive Environment — Sensitive Environment Value: 12

<1000 feet to Lower Duwamish Waterway

4.0 Release — Release to Surface Water Value: 0

Explain basis for scoring a release to surface water

No confirmed release.

Pathway Scoring - Surface Water Route, Human Health Pathway

$SW_H = (SUB_{SH}*40/175)*[(MIG_S*25/24) + REL_S + (TAR_{SH}*30/115)]/24$

Where:

SUB_{SH} = (Human Toxicity Value + 3)*(Containment + 1) + Substance Quantity	SUB_{SH}	82
MIG_S = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope	MIG_S	10
REL_S = Release to Surface Water	REL_S	0
TAR_{SH} = Distance to Surface Water + Population Served by Surface Water + Area Irrigated	TAR_{SH}	10
	SW_H	10.2

Pathway Scoring -Surface Water Route, Environmental Pathway

$SW_E = (SUB_{SE}*40/153)*[(MIG_S*25/24) + REL_S + (TAR_{SE}*30/34)]/24$

Where:

SUB_{SE} = (Env Tox Value + 3) * (Containment + 1) + Substance Qty	SUB_{SE}	62
MIG_S = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope	MIG_S	10
REL_S = Release to Surface Water	REL_S	0
TAR_{SE} = Distance to Surface Water + Distance to Fishery + Distance to Sensitive Environment	TAR_{SE}	34
	SW_E	27.3

Worksheet 5

Air Route

CSID: 18 **Site Name:** Ash Grove Cement

1.0 Substance Characteristics

1.1 Introduction (WARM Scoring Manual) - Please Review before scoring

1.2 Human Toxicity

Substance	Ambient Air Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
benzene/gasoline	10	3	X	5

Highest Value 10

Bonus Points? 0

Toxicity Value 10

1.3 Mobility

Gaseous Mobility	Max Value:	3
Particulate Mobility	Soil Type:	
	Erodibility:	
	Climatic Factor:	

Mobility Value 3

1.4 Final Human Health Toxicity/Mobility Matrix Value **HH Final Matrix Value** 15

1.5 Environmental Toxicity/Mobility

Substance	Non-human Mammalian Inhalation Toxicity (mg/m3)	Acute Value	Mobility Value	Table A-7 Matrix Value
gasoline/benzene	31,947	3	3	5

Env. Final Matrix Value 5

1.6 Substance Quantity

Amount: 400 sq feet

Basis: Estimated surface area of soil contamination

Substance Quantity Value 3

Worksheet 5

Air Route

CSID: 18 **Site Name:** Ash Grove Cement

2.0 Migration Potential

2.1 Containment Containment Value: 5

Explain Basis: subsurface release with >2 feet of cover, no vapor collection system

3.0 Targets

3.1 Nearest Population Population Distance Value: 8

marina across east waterway (1000 ft)

3.2 Distance to and name of nearest sensitive environments Sensitive Environment Value: 7

1000' to Terminal 102 park (across East Waterway)

3.3 Population within 0.5 miles Population Value: 5

27 population

4.0 Release Release to Air Value: 0

Explain basis for scoring a release to air:

No confirmed release

Pathway Scoring - Air Route, Human Health Pathway

$AIR_H = (SUB_{AH}*60/329)*[REL_A+(TAR_{AH}*35/85)]/24$

Where:

SUB_{AH} =(Human toxicity + 5) * (Containment + 1) + Substance Qty	SUB_{AH}	123
REL_A = Release to Air	REL_A	0
TAR_{AH} = Nearest Population + Population within 1/2 mile	TAR_{AH}	13
	AIR_H	5.1

Pathway Scoring - Air Route, Environmental Pathway

$AIR_E = (SUB_{AE}*60/329)*[REL_A+(TAR_{AE}*35/85)]/24$

Where:

SUB_{AE} =(Environmental Toxicity Value +5)*(Containment +1) +Substance Qty	SUB_{AE}	63
REL_A = Release to Air	REL_A	0
TAR_{AE} = Nearest Sensitive Environment	TAR_{AE}	7
	AIR_E	1.4

Worksheet 6

Groundwater Route

CSID: 18 **Site Name:** Ash Grove Cement

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
PCBs	10	3	X	6
Arsenic	8	5	5	7
Lead	6	X	10	X
Cadmium	8	5	5	X
Chromium (III)	6	X	1	X
Zinc	2	X	1	X
Copper	2	X	1	X
TPH as Gasoline	8	3	X	5
TPH as Diesel	4	5	3	X

Highest Value 10

Bonus Points? +2

Toxicity Value 12

1.2 Mobility

Cations/Anions Max Value: 3

Solubility Max Value: 3 Mobility Value 3

1.3 Substance Quantity

Amount: 850 cubic yards

Basis: Estimated volume of impacted soils

Substance Quantity Value 3

2.0 Migration Potential

2.1 Containment Containment Value 10

Explain Basis: Suspected spill/discharge with contaminated soil

2.2 Net Precipitation >10-20 inches Net Precipitation Value 2

2.3 Subsurface Hydraulic Conductivity Conductivity Value 3

Silty sand

2.4 Vertical Depth to Groundwater 10 feet

Confirmed release: No Depth to Aquifer Value 8

3.0 Targets

3.1 Groundwater Usage Aquifer Use Value 2

Commercial and industrial use

Worksheet 6

Groundwater Route

CSID: 18 **Site Name:** Ash Grove Cement

3.2 Distance to Nearest Drinking Water Well >10,000 feet

Well Distance Value 0

3.3 Population Served within 2 Miles Population Served Value 0

0 people

3.4 Area Irrigated by GW Wells within 2 miles Area Irrigated Value 0

0 acres

4.0 Release Release to Groundwater Value 0

Explain basis for scoring a release to groundwater:

No confirmed release to groundwater

Pathway Scoring - Groundwater Route, Human Health Pathway

$GW_H = (SUB_{GH}*40/208)*[(MIG_G*25/17)+REL_G+(TAR_{GH}*30/165)]/24$

Where:

SUB_{GH} =(Human toxicity + mobility + 3) * (Containment + 1) + Substance Qty	SUB_{GH}	201
MIG_G=Depth to Aquifer+Net Precip + Hydraulic Conductivity	MIG_G	13
REL_G = Release to Groundwater	REL_G	0
TAR_{GH} = Aquifer Use + Well Distance + Population Served + Area Irrigated	TAR_{GH}	2.0
	GW_H	31.4

Washington Ranking Method

Route Scores Summary and Ranking Calculation Sheet

Site Name: Ash Grove Cement West, Inc **CSID:** 18

Site Address: 3801 W Marginal Way S, Seattle, WA 98134 **FSID:** 2142

HUMAN HEALTH ROUTE SCORES

Enter Human Health Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	10.2	2
Air	5.1	1
Groundwater	31.4	2

H=	2
M=	2
L=	1

$$\frac{H^2 + 2M + L}{8} = \frac{4 + 4 + 1}{8}$$

Human Health Priority Bin Score: **2**

rounded up to next whole number

ENVIRONMENT ROUTE SCORES

Enter Environment Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	27.3	3
Air	1.4	1

H=	3
L=	1

$$\frac{H^2 + 2L}{7} = \frac{9 + 2}{7}$$

Environment Priority Bin Score: **2**

rounded up to next whole number

Comments/Notes:

FINAL MATRIX RANKING **4**

FOR REFERENCE:

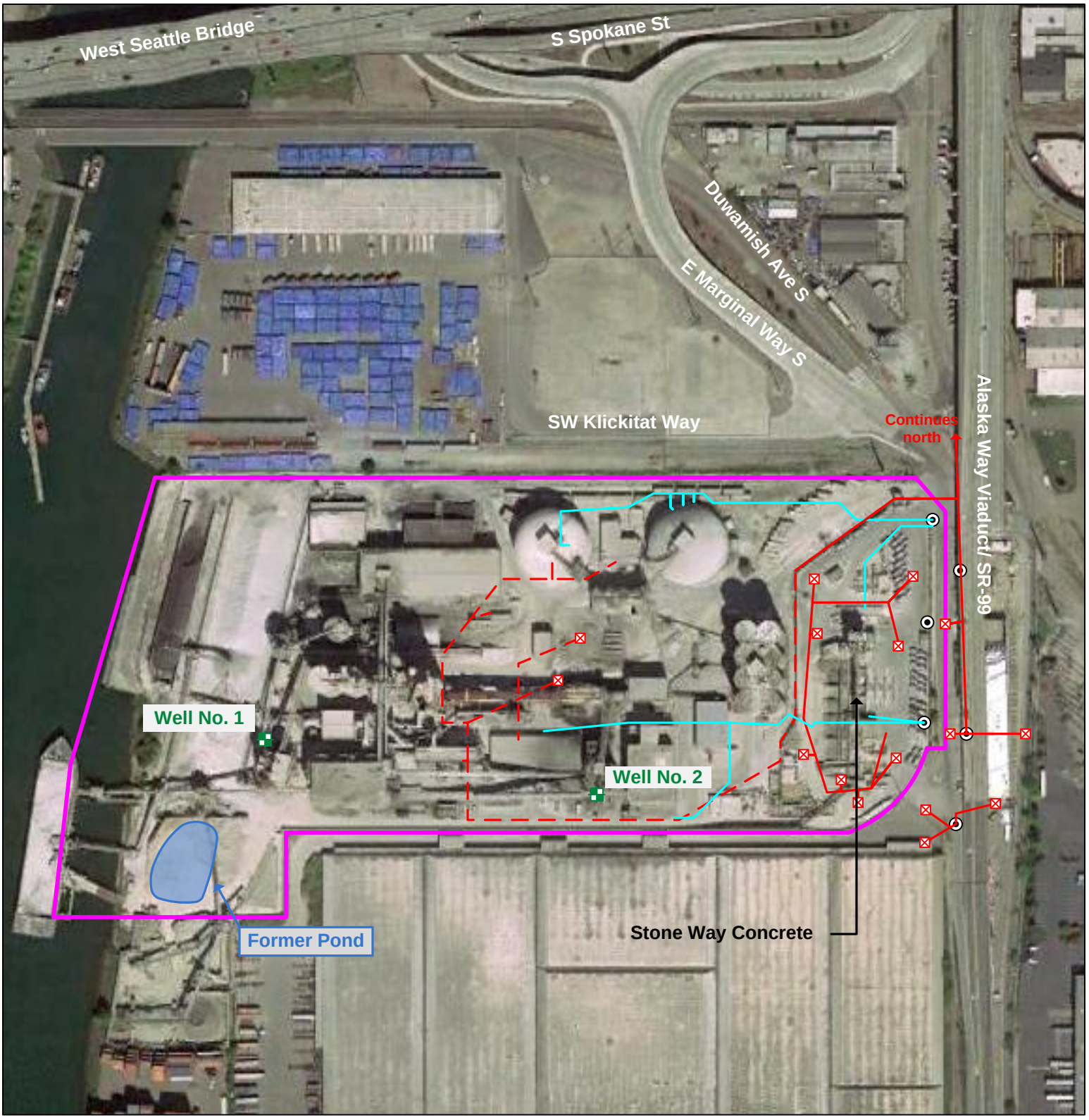
Final WARM Bin Ranking Matrix

Human Health Priority	Environment Priority 5	4	3	2	1	N/A
5	1	1	1	1	1	1
4	1	2	2	2	3	2
3	1	2	3	4	4	3
2	2	3	4	4	5	3
1	2	3	4	5	5	5
N/A	3	4	5	5	5	NFA

Quintile Values for Route Scores - February 2015 Values

Quintile	Human Health Surface Water	Air	Ground Water	Environment Surface Water	Air
5	>= 30.7	>= 37.6	>= 51.6	>= 50.9	>= 29.9
4	>= 23.1	>= 23.8	>= 40.9	>= 31.2	>= 22.5
3	>= 14.1	>= 15.5	>= 33.2	>= 23.6	>= 14.0
2	>= 7.0	>= 8.5	>= 23.5	>= 11.0	>= 1.6
1	<= 6.9	<= 8.4	<= 23.4	<= 10.9	<= 1.5

Quintile value associated with each route score entered above



Legend:

- Property location (approximate)
- Former pond location (approximate)
- Storm drain utility line (approximate)
- Sanitary sewer utility line (approximate)
- Catch basin location (approximate)
- Production well location (approximate)

Notes:

1. All locations are approximate, and not to scale.

N

Ash Grove Cement
3801 East Marginal Way South
Seattle, WA 98134

DEPARTMENT OF ECOLOGY
State of Washington

Site Overview Map

CSID 18

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