SITE HAZARD ASSESSMENT
WORKSHEET 1
Summary Score Sheet

SITE INFORMATION:
Bainbridge Island City Strawberry Plant
240 Weaver Rd NW
Bainbridge Island, Kitsap County, WA 98110

Section/Township/Range: 27/25N/2E
Latitude: 47.625265 °
Longitude: -122. 531011°
Ecology Facility Site ID No.: 15438
Parcel # 272502-4-006-2000

Site scored/ranked for the August 2011 Hazardous Sites List update
August 2, 2011

SITE DESCRIPTION :

The Bainbridge Island City Strawberry Plant site is a marine shoreline parcel of approximately 4.1 acres located on the north side of Eagle Harbor west of the Winslow area of the City of Bainbridge Island (COBI). The site is owned by COBI who has recently restored the natural shoreline to the site from the commercial/industrial uses of the last century and is converting the site into a public park. Prior to restoration, the shoreline had a concrete foundation and slabs in various locations. There was and continues to be an asphalt parking lot in the center of the parcel. The site extends upland into a wooded area. A stream runs south through the property on the east side. A small building is also located on the site near the shore and adjacent to the asphalt parking lot. The surrounding parcels are mostly residential.

Several monitoring wells were noted in the asphalt parking lot prior to restoration. Only one of these wells can be located after restoration. One of the wells was damaged during site restoration and was properly decommissioned. The third well is presumably still in place but not visible at ground level. There are two other wells on the property. A drinking water well was found in the upland portion of the property. This upland well is a casing only. Another production well was located in the structure on the property used for irrigation. This well is currently not connected to any plumbing.

The site is located on gently sloped terrain of unconsolidated glacial deposits. The Strawberry Plant site is on Eagle Harbor of Puget Sound. Shallow groundwater flow in this area is generally to the south and near the shoreline may be tidally influenced. Surface water flows south. The east border of the property is a stream, which flows from north to south.

Previous Studies/History of contamination

This site was originally developed in about 1909 as a strawberry canning plant for farmers on Bainbridge Island. A large warehouse was built onsite. The building was half over the marine shoreline and half over land. This was to facilitate loading of the packaged strawberries onto ships for transport off the island. The Strawberry Plant operated until sometime in the 1930s. A concrete

plant was developed and operated onsite in the 40s, 50s, and 60s. After that time, the site operated as a commercial center for many years containing offices, a boat repair facility, and contractor spaces. The warehouse burned down in 1997. Portions of the burnt material from the building were apparently left on site.

The site has recently been restored to natural shoreline. Concrete foundations, and fill soils above native soils were removed. The shoreline has been cut back and reshaped. Gravel and sand has been added to the site. Most of the parking lot has been covered.

In August 2010 an Initial Investigation was conducted by the Kitsap County Health District (Health District). Environmental Report Tracking System (ERTS) Report # 621303 referred to contamination found in a groundwater study from 2004. Investigation revealed that several studies of the groundwater and soils at the site have been conducted. One study, by Hart Crowser, in 2004, identified arsenic in the groundwater at the site in exceedance of the Model Toxics Control Act (MTCA). A second ERTS Report (#623053) was received by the Health District in February 2011. The Health District recommended to the Washington State Department of Ecology (Ecology) that a Site Hazard Assessment (SHA) was appropriate for the site.

The property directly east of the site is the Tosco Bainbridge Island Bulk Plant 1784 (FS ID 26595127) and is ranked a 2 on the hazardous sites list. It is probable that petroleum contamination from the Tosco site to the east extends onto the Strawberry Plant site.

The site was placed on Ecology's Confirmed and Suspected Contaminated Sites List (CSCS) in August 2010 and Ecology notified the property owner in March 2011 that an SHA was scheduled for the site.

The following reports were reviewed for this assessment:

- Subsurface Investigation- 240 NW Weaver Rd, Robinson, Noble, & Saltbush, June 7, 2004
- Results of Groundwater Sampling and Analysis, 240 NW Weaver Rd Property, Bainbridge Island, WA, Hart Crowser, August 2, 2004
- Sampling Activities – Strawberry Plant Shoreline Restoration Project, Bainbridge Island, WA, Aspect Consulting, September 8, 2008
- Memorandum – Review of Soil and Groundwater Chemistry Data, Strawberry Plant Site, 240 NW Weaver Rd, Bainbridge Island, WA, Anchor QEA, August 20, 2010
- Supplemental Sampling Activities – Strawberry Plant Shoreline Restoration Project, Bainbridge Island, WA, Aspect Consulting, January 12, 2011

Review of the reports listed above and sampling conducted as a part of this SHA showed soil exceedances of MTCA, Method A, Unrestricted Land Uses, for arsenic, lead, mercury, and carcinogenic Polyaromatic Hydrocarbons (cPAHs). See Table 1. for all samples that exceed MTCA levels in soil. Groundwater exceedances were found for arsenic. See Table 2. for groundwater exceedances.

Table 1. Soil sampling exceedances of MTCA[1] (mg/kg)

Sampling Done By	Sample #	Report Date	Pb	Hg	cPAHs
Aspect Consulting	CS-2	1/12/2011	**405**	**2.3**	**0.155**
Health District	SPS-5	7/13/2011	--	--	**0.111**
Health District	SPS-6	7/13/2011	--	--	**0.115**
--	MTCA Stnd	--	250	2	0.1

The results presented in Table 1 do not include all of the results in the record, but only those results where either a cleanup happened and the confirmation sampling results showed analytes exceeding MTCA or there were MTCA exceedances that were not addressed.

Table 2. Groundwater sampling exceedances of MTCA[2] (µg/l)

Sampling Done By	Sample #	Report Date	As
Hart Crowser	MW-3	8/2/2004	**8**
Health District	SPW-7	7/13/2011	**20.4**
--	MTCA Stnd	**--**	5

Potential Sources of Contamination

The likely sources of contamination at the Strawberry Plant site are wastes left onsite after the building burned down. In addition, the years of various businesses at the site most likely contributed wastes from spills and management that may have been acceptable at the time. For example, a concrete business operated at the site for many years. Maintenance of the trucks probably took place at the site.

Drinking Water Wells

Drinking water wells within two miles of the site include Group A, Group B, and private well systems which serve a total of 7805 or more persons. Local drinking water wells are up gradient of the site with the closest public well being approximately 1100 feet from the site. It is unlikely that any new wells would be installed near the site as the area is served by the City of Bainbridge Island Water System. There are two water wells on the site capable of being used for drinking water. Neither is in use.

Site Inspection

Multiple site inspections have been conducted by Health District staff. The initial site inspection for the SHA was conducted on May 13, 2011, by Health District staff. The site inspection confirmed the physical aspects of the properties and gave staff some familiarity with the site and surrounding area.

[1] Model Toxics Control Act Table 740-1 Method A Soil Cleanup Levels for Unrestricted Land Uses
[2] Model Toxics Control Act Table 720-1 Method A Cleanup Levels for Ground Water

The site had been radically altered from the original site visit for the Initial Investigation on August 11, 2010. A site visit to prepare for the soil and groundwater sampling was conducted on June 17, 2011. The sampling event took place on June 29, 2011. Samples were collected below the recent fill sands at the native soil interface-approximately 1' deep. Results that are exceedances of MTCA are shown in the tables above.

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):

1) Since the significant contamination documented onsite is primarily subsurface, the surface water and air routes are not applicable for Washington Ranking Method scoring for this site. Thus, only the groundwater route will be scored.
2) There were multiple detections for metals and TPH-Diesel above background levels. Full characterization of the site is strongly recommended.
3) The property directly east of the site is the Tosco Bainbridge Island Bulk Plant 1784 (FS ID 26595127) and is ranked a 2 on the hazardous sites list. It is probable that petroleum contamination from the Tosco site to the east extends onto the Strawberry Plant site.
4) The Eagle Harbor Wyckoff Superfund site is located in Eagle Harbor approximately 1 mile away. Both of these sites are located on the shoreline of Eagle Harbor. Cross contamination from the Eagle Harbor Wyckoff site is possible. PAHs and mercury were identified at Eagle Harbor Wyckoff as contaminants of concern.

ROUTE SCORES:

Surface Water/Human Health:	**NS**	Surface Water/Environmental:	**NS**
Air/Human Health:	**NS**	Air/Environmental:	**NS**
Groundwater/Human Health:	**68.6**		

OVERALL RANK: 2

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE –** *Not Scored*
   a. List those substances to be considered for scoring: Source:

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

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

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

2. **AIR ROUTE –** *Not Scored*
   a. List those substances to be considered for scoring: Source:

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

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

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

3. **GROUNDWATER ROUTE**
   a. List those substances to be considered for scoring: Source: 1, 2, 3, 4

      Arsenic, lead, mercury, and cPAHs

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

      These substances were detected in groundwater and soil at the site in concentrations exceeding their respective MTCA cleanup levels.

   c. List those management units to be considered for scoring: Source: 1, 2, 3,4

      Groundwater

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

   The contaminating substances were detected in groundwater and soil samples. Arsenic, lead, mercury, and cPAHs were found in concentrations exceeding MTCA cleanup levels.

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	5	0.001	5	A	1.75	7
2	Lead	15	6	--	ND	0.001	10	B2	--	ND
3	Mercury	2	8	--	ND	0.0003	5	--	--	ND
4	cPAHs	0.2	10	50	10	--	ND	B2	12	7

** Potency Factor*

Source: 1,2,3,4,6,7

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		OR	Solubility (mg/L)	
1=	>1.0 = 3		1=	
2=	0.1 to 1.0 = 2		2=	
3=	>1.0 = 3		3=	
4=			4=	1.2 x10-3=0

Source: 1,2,3,4,6,7

Value: 3
(Max = 3)

1.3 Substance Quantity:

Explain basis: Unknown, use default = 1 : Unknown quantity of contaminated groundwater = 1

Source: 1,2,3,4,6,7

Value: 1
(Max=10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment (explain basis):** Spill	1,2,3,4,5	**10** (Max = 10)
2.2	**Net precipitation:** 29.7"-5.6"= 24.1"	8	**3** (Max = 5)
2.3	**Subsurface hydraulic conductivity:** sandy silt= Hydraulic Conductivity of $>10^{-5}$ to 10^{-3} cm/sec	1,6,7, 12	**3** (Max = 4)
2.4	**Vertical depth to groundwater:** Approximately 3.5'	1,4,12	**8** (Max = 8)

3.0 TARGETS

		Source	Value
3.1	**Groundwater usage:** Public supply, alternate sources available	5,9,11	**4** (Max = 10)
3.2	**Distance to nearest drinking water well:** 1100 feet	5,9,11	**4** (Max = 5)
3.3	**Population served within 2 miles:** approx 7805	5,9,10	**88** (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles:** none	6,9,10	**0** (Max = 50)

4.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: Confirmed release through analytical evidence.	1,2,3,4,5,6	**5** (Max = 5)

SOURCES USED IN SCORING

1. Subsurface Investigation- 240 NW Weaver Rd; Robinson, Noble, & Saltbush, June 7, 2004
2. Results of Groundwater Sampling and Analysis, 240 NW Weaver Rd Property, Bainbridge Island, WA, Hart Crowser, August 2, 2004
3. Sampling Activities – Strawberry Plant Shoreline Restoration Project, Bainbridge Island, WA, Aspect Consulting, September 8, 2008
4. Memorandum – Review of Soil and Groundwater Chemistry Data, Strawberry Plant Site, 240 NW Weaver Rd, Bainbridge Island, WA, Anchor QEA, August 20, 2010
5. Supplemental Sampling Activities – Strawberry Plant Shoreline Restoration Project, Bainbridge Island, WA, Aspect Consulting, January 12, 2011
6. Site Hazard Assessment Sampling Site Visit, Grant Holdcroft, Kitsap County Health District, June 29, 2011
7. Toxicology Database for Use in Washington Ranking Method Scoring, Washington State Department of Ecology, January 1992
8. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
9. Washington Climate – Net Rainfall Table
10. Kitsap County Health District Drinking Water Systems Database
11. Washington State Department of Health, Sentry Database for public water supplies.
12. Soil Survey of Kitsap County, Washington, US Department of Agriculture, 1980


SHEPARD WAY NW
Tosco Site
WEAVER RD NW
EAKIN DR NW
Strawberry Plant Site
MW-3 Water
As 8 ug/l
Hart Crowser
SPW-7 Water
As 20.4 ug/l
Health District
SPS-6 Soil
cPAHs 0.115 mg/kg
Health District
SPS-5 Soil
cPAHs 0.111 mg/kg
Health District
CS-2 Soil
Pb 405 mg/kg
Hg 2.3 mg/kg
cPAHs 0.155 mg/kg
Aspect Consulting
WINSLOW WAY W
LOVELL AVE SW
GOWEN PL NW
N
GAH 7/28/2011
Bainbridge Island City Strawberry Plant Soil and Groundwater
exceedance sample locations
0 75 150 300 450 600
Feet
KITSAP COUNTY HEALTH DISTRICT