

DEPARTMENT OF ECOLOGY
Toxics Cleanup Program

Memorandum

February 3, 2015

TO: TCP Files for FSIDs 2298 (Union Bay Shipbuilding) and 76266689 (Marine Fluid Systems)

FROM: Priscilla Tomlinson, NWRO

SUBJECT: Site boundary at southeast corner of Marine Fluids property

At the request of the former VCP Site Manager, Ron Timm, I reviewed the data for sample locations in the southeast corner of the Marine Fluid Systems (MFS) property and the neighboring Trident Seafoods (TS) property to determine the extent of contamination.

The original site, Union Bay Shipbuilding (FSID 2298), appears to have included what is now the MFS property (FSID 76266689) and the southwest corner of what is now the TS property (not listed as a site in ISIS). Sandblast grit was stored in this area and concentrations of arsenic, cadmium, and lead in some surface soil samples exceed their MTCA Method A soil cleanup levels for residential and industrial land use. The MFS property has an environmental covenant that specifies the land use as industrial. Groundwater concentrations met standards, and an NFA was provided in 2000. The soil sample results for the area where sandblast grit was stored are summarized in Table 1, attached.

The samples with exceedances occur on both MFS and TS property. Data for the MFS property are shown in Table 13 of the Subsurface Environmental Study (EA 1999), attached. Concentrations of arsenic in surface soil exceed the Method A value of 20 mg/kg in the composite GRIT sample (31 mg/kg) and at TP-3 (157 mg/kg). A map of results is attached.

Data for the TS property are shown in Table 5 of Appendix A of EA (1999), attached. Arsenic exceeds the Method A value in the following samples: "offsite" (108 mg/kg), GRIT (250 mg/kg), SS-3A (139 mg/kg), and SS-4A (72 mg/kg). Cadmium exceeds the Method A value of 2 mg/kg at "offsite" (4.7 mg/kg), T-soil (2.3 mg/kg), and GRIT (6.0 mg/kg). Lead exceeds the Method A value of 1,000 mg/kg at SS-3A (1,030 mg/kg). The "offsite" sample was originally thought to be off-site, which would have placed it on the MFS property, but was later determined to be on the TS property. A map of results is attached.

FSIDs 2298 and 76266689

February 3, 2015

The results indicate that the metals contamination on both properties is linked to a common source, but no final determination has been made.

Reference:

EA. 1999. Subsurface environmental study, Marine Fluid Systems, Seattle, WA. Prepared by Environmental Associates, Inc., Bellevue, WA, for Ballard Land Management, Roy, WA.

Table 1. Arsenic, Cadmium, and Lead in Soil at Marine Fluid Systems and Trident Seafoods

	Method A Industrial	Marine Fluid Systems			Trident Seafoods					
		GRIT SE corner	B-2-S SE corner	TP-3-1 SE corner	Grit Near fence	SS-3A 50 ft from grit	SS-4A 75 ft from grit	"Offsite" Near fence	T-Soil Near trestle?	Trestle Wood Soil or wood?
Arsenic	20	31	10.1	157	250	139	72	108	2.4 U	7.1
Cadmium	2	0.56	0.56	1.69	6.0	1.8	0.8	4.7	2.3	0.6
Lead	1,000	230	48.7	291	360	1,030	117	250	9.9	46

Results in mg/kg.

Shaded results exceed the applicable Method A cleanup level for industrial properties.

SE - southeast

LABORATORY ANALYSES: METALS (SOIL)

Several soil samples obtained from across the property were submitted to the project laboratory for analysis for total metals including arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver (RCRA Metals) using inductively coupled plasma (ICP) and atomic absorption (AA) performed in accordance with EPA Method 6000/7000 series analyses. Soil samples selected for analysis included surficial samples obtained from borings B-1 and B-2, shallow soil samples obtained from B-4, samples obtained from varying depths at TP-1, and samples obtained from TP-2 and TP-3. Additionally, attempting to respond to concerns raised by Trident Seafoods regarding cleanup of soil and sandblasting grit stored by Marine Fluid Systems on a very small portion of the adjacent Trident property, two samples (GRIT-1 and GRIT-2) of surficial soil consisting predominantly of sandblasting grit were composited at the project laboratory and analyzed for total metals. The locations of where the samples were obtained is depicted on the Site Exploration Plan, Plate 3. Table 13 below summarizes the results of the laboratory analyses for total metals.

Marine Fluids

TABLE 13: EPA Method 6000/7000 Series Metals Results (Soil)¹

Sample	Depth (feet)	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
B-1-S	Surface	33.3	101	0.741	17.8	167	0.908	<0.500	<0.500
B-2-S	Surface	10.1	43.1	0.560	17.9	48.7	<0.100	<0.500	<0.500
B-3-1	2.25	<0.500	19.1	<0.500	7.65	0.988	<0.100	<0.500	<0.500
B-4-1	2.25	0.720	15.9	<0.500	20.4	2.67	<0.100	<0.500	<0.500
TP-1-2.25'	2.25	11.0	74.3	0.95	21.9	357	<0.100	<0.500	<0.500
TP-1-3.25'	3.25	1.37	26.9	<0.500	11.7	3.42	<0.100	<0.500	<0.500
TP-2-5'	5.0	5.06	133	<0.500	34.1	4.05	<0.100	<0.500	<0.500
TP-3-1'	1.0	157	130	1.69	38.7	291	0.638	<0.500	<0.500
GRIT-1/ GRIT-2 Composite	Surface	31	290	0.56	49	230	<0.26	<10	<0.51
MTCA Cleanup Guideline ²		200.0 ^A	5,600 ^B	10.0 ^A	500.0 ^A	1,000.0 ^A	1.0 ^A	400.0 ^B	400.0 ^B
Notes: 1 - All detection limits, results, and cleanup levels are given in milligrams per kilograms (mg/kg) {parts per million (ppm)}. 2 - Guideline cleanup standards are published in the Model Toxics Control Act (MTCA, Chapter 173-340-740 WAC. The "A" flag indicates the Method A Industrial cleanup level, while the "B" flag indicates the Method B cleanup level. Method A Industrial given when available.									

As summarized in Table 13 above, none of the samples analyzed contain concentrations of metals in excess of the applicable MTCA Method A Industrial or Method B cleanup levels. Selenium and silver were not detected in any of the analyzed samples, and mercury was detected in only two of the analyzed samples. Only one sample (TP-3-1') contained an "elevated" arsenic concentration, and two samples (TP-1-2.25' and TP-3-1') contained "elevated" lead concentrations, however, these concentrations are well below the Method A Industrial cleanup levels for arsenic and lead. Sample B-1-S obtained from the ground surface at the northeast corner of the property contained a



ENVIRONMENTAL ASSOCIATES, INC.

2122 - 112th Avenue N.E., Ste. B-100
Bellevue, Washington 98004

SITE EXPLORATION PLAN

Marine Fluid Systems
801 Northwest 42nd Street
Seattle, Washington

Job Number:
JN 8125

Date:
March 1999

Plate:
3

grit was stored in N
corner in 1993
surface 5 ft
As- 33.3 As-
Cd- 0.741 Cd-
Pb- 167 Pb- 4.0

Legend

- Developments/buildings
- MW-1 Location of EAI monitoring wells
- TP-1 Location of EAI test pit excavation
- B-5 Location of EAI boring
- SS-1 Location of EAI soil grab sample
- SP-1 Location of EAI soil probe (Cascade Probe)
- GRIT-1 Location of EAI soil grab sample with abundant sandblasting grit

Approximate direction
of shallow-seated
groundwater flow



Approximate Scale
0 50 ft.

APPROXIMATE
SHORELINE

WHARF

MACHINE AND
CARPENTER
SHOP

CURRENT AST
FOR HEATING OIL

OFFICE/WAREHOUSE
(ornamental iron)

SHED

B-1/MW-1

SS-1
SP-5
TP-2

REPORTED LOCATION FORMER
HEATING OIL UST

INTERPRETED LOCATION
FORMER GASOLINE UST

SP-13
SP-11

SP-12

GENERAL
STORAGE
surface

As- 10.1
Cd- 0.56
Pb- 48.7

LOCATION OF
BOAT ON
BLOCKS

SP-6

GRIT-2

GRIT-1

B-2/MW-2

TP-3

WINCH

sandblast
sand storage
in 1993

SHIPPING
CONTAINERS

B-4/MW-4
SP-9

SP-8

SP-7

Trident Seafoods
As- 15.1
Cd-
Pb- 2.1
1 ft

occupied by water from
Press in 1993 - solvent
soil samples with meter
above CULS

partially submerged
MARINE RAILWAY
sandblast sand in 1993

WHARF

Lake Washington
Ship Canal

results from
Table 13 in
Environmental Assoc. 1999

Table 5
Summary of Laboratory Results
Metals In Soil

Trident

measured

Sample Matrix	SS-3A Soil	SS-4A Soil	Trestle Wood	T-Soil Soil	Offsite Soil	Gril Gril	MTCA Cleanup Levels
Metal	Concentration (mg/kg)						
Antimony	NA	NA	1.4 U	1.4 U	24	7.3	32.0 B
Arsenic	139	72	7.1	2.4 U	108 <i>200</i>	250	20.0 A
Barium	167	120	NA	NA	NA	NA	4,000 B
Beryllium	NA	NA	0.14 U	0.14	0.18	0.45	0.23 B
Cadmium	1.8	0.8	0.6	2.3	4.7 <i>1.0</i>	6.0	2.0 A
Chromium	53.5	39.6	4.3	24	80	16	100.0 A
Copper	NA	NA	124	7.8	470 <i>100</i>	2,500	400 B
Lead	1,030	117	46	9.9	250 <i>1,000</i>	360	250.0 A
Mercury	0.06	0.05	0.1 U	0.1 U	0.4	0.1 U	1.0 A
Nickel	NA	NA	4.5	28	35	5.8	1,600 B
Selenium	5 U	5 U	2.4 U	2.4 U	2.4 U	2.4 U	240 B
Silver	0.9	0.5	0.24 U	0.24 U	0.24 U	0.6	240 B
Thallium	NA	NA	2.4 U	2.4 U	2.4 U	2.4 U	5.6 B
Zinc	NA	NA	190	52	1,600	6,000	16,000 B

- U - Metal undetected. Associated value is sample detection limit.
- NA - Sample not analyzed for particular metal.
- A - Method A (non-Industrial sites)
- B - Method B

Legend

- ⊙ Surface Samples
- ⊙ Hand-Auger Test Holes
- Temporary Monitoring Wells
- Hand Auger Test Hole Attempts (hit concrete - asphalt)
- ⊙ Composite Surface/Subsurface Soil Sample

---32--- Approximate Elevation MSL

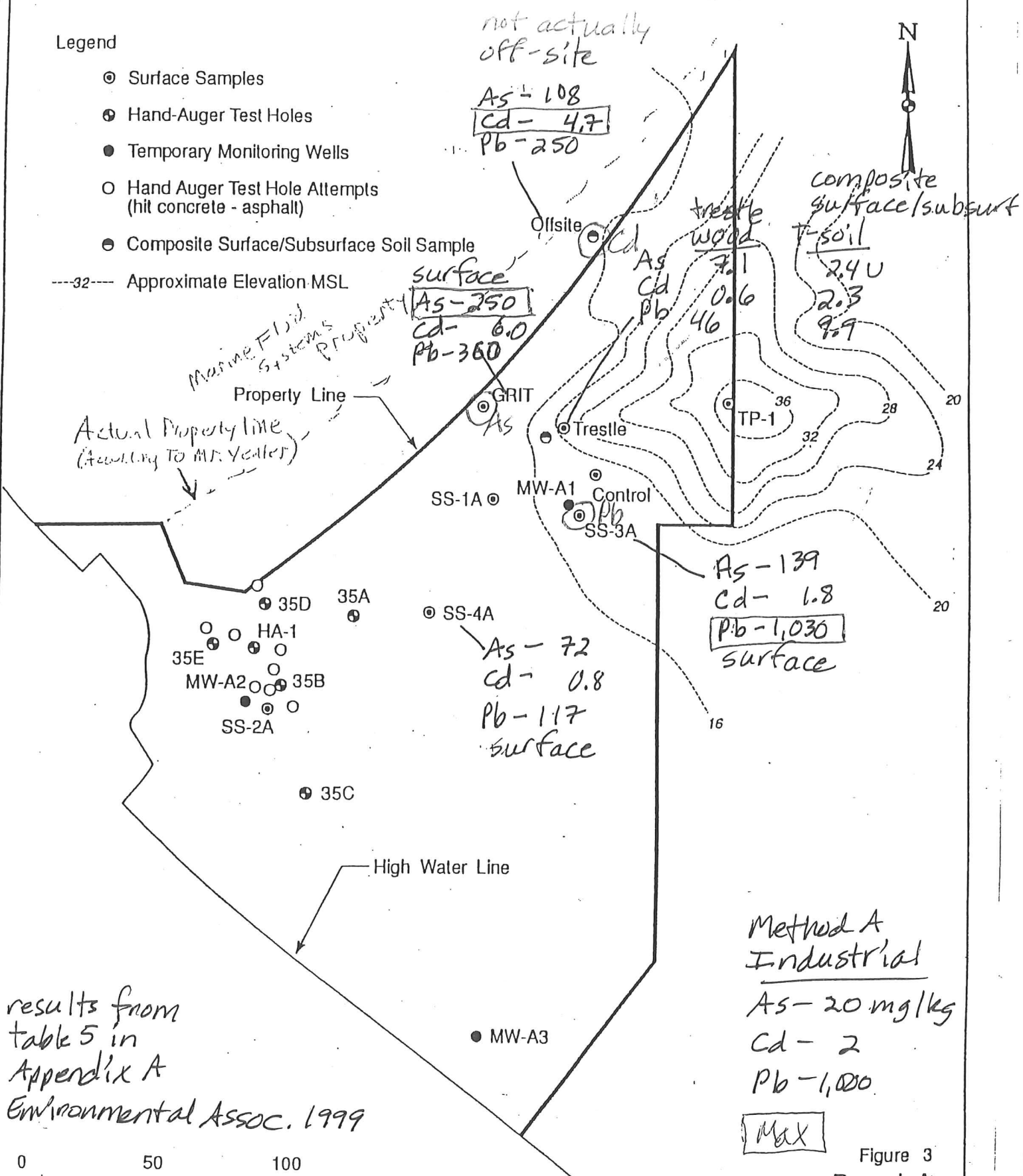


Figure 3

Parcel A

Sample, Boring and Well Locations

Waterfront Press

Dames & Moore