Figures

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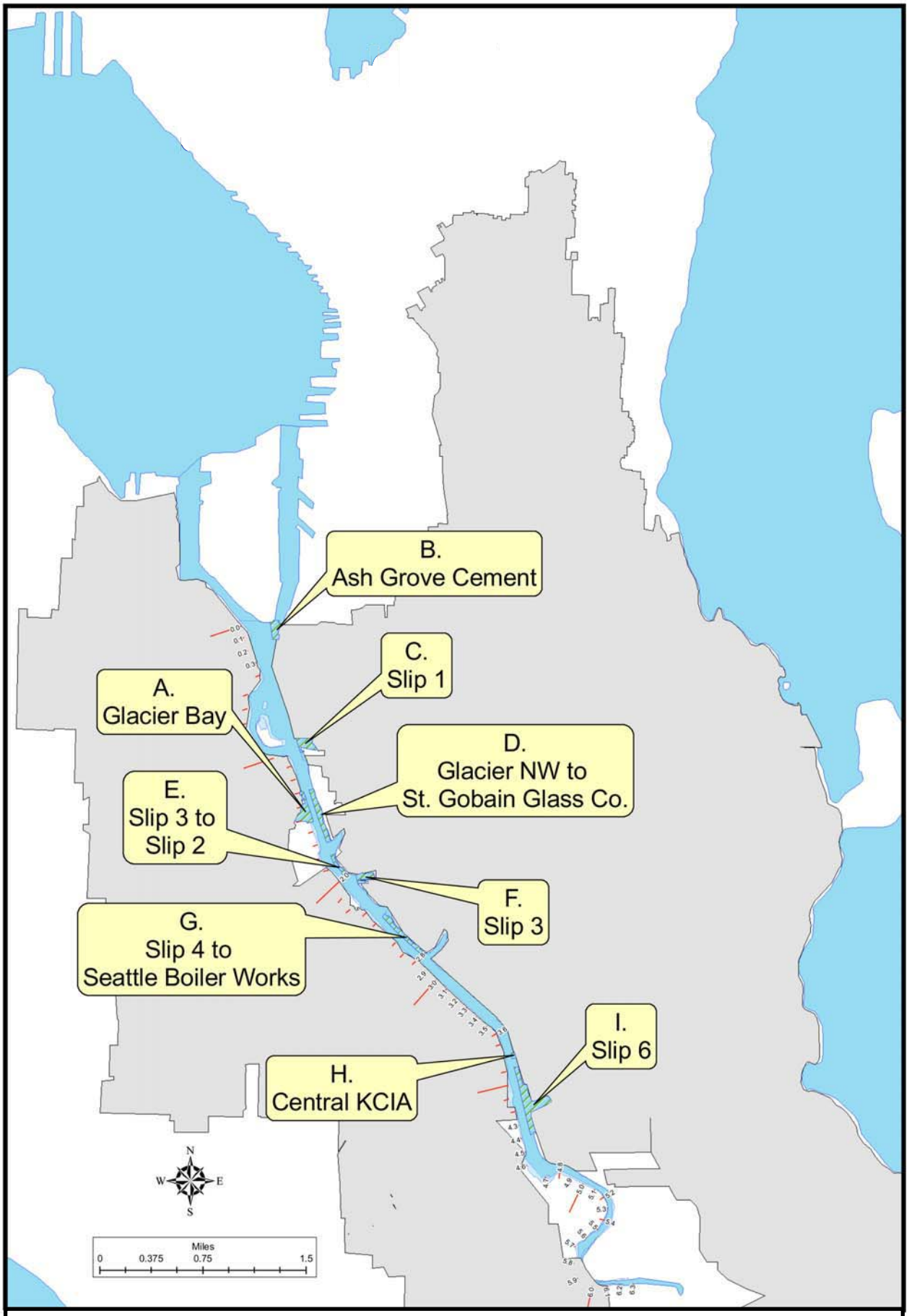


SAIC
From Science to Solutions

Figure 1. Lower Duwamish Waterway Tentative Tier 2 Sites

Stormwater Outfall
Property Boundary

SAIC
From Science to Solutions

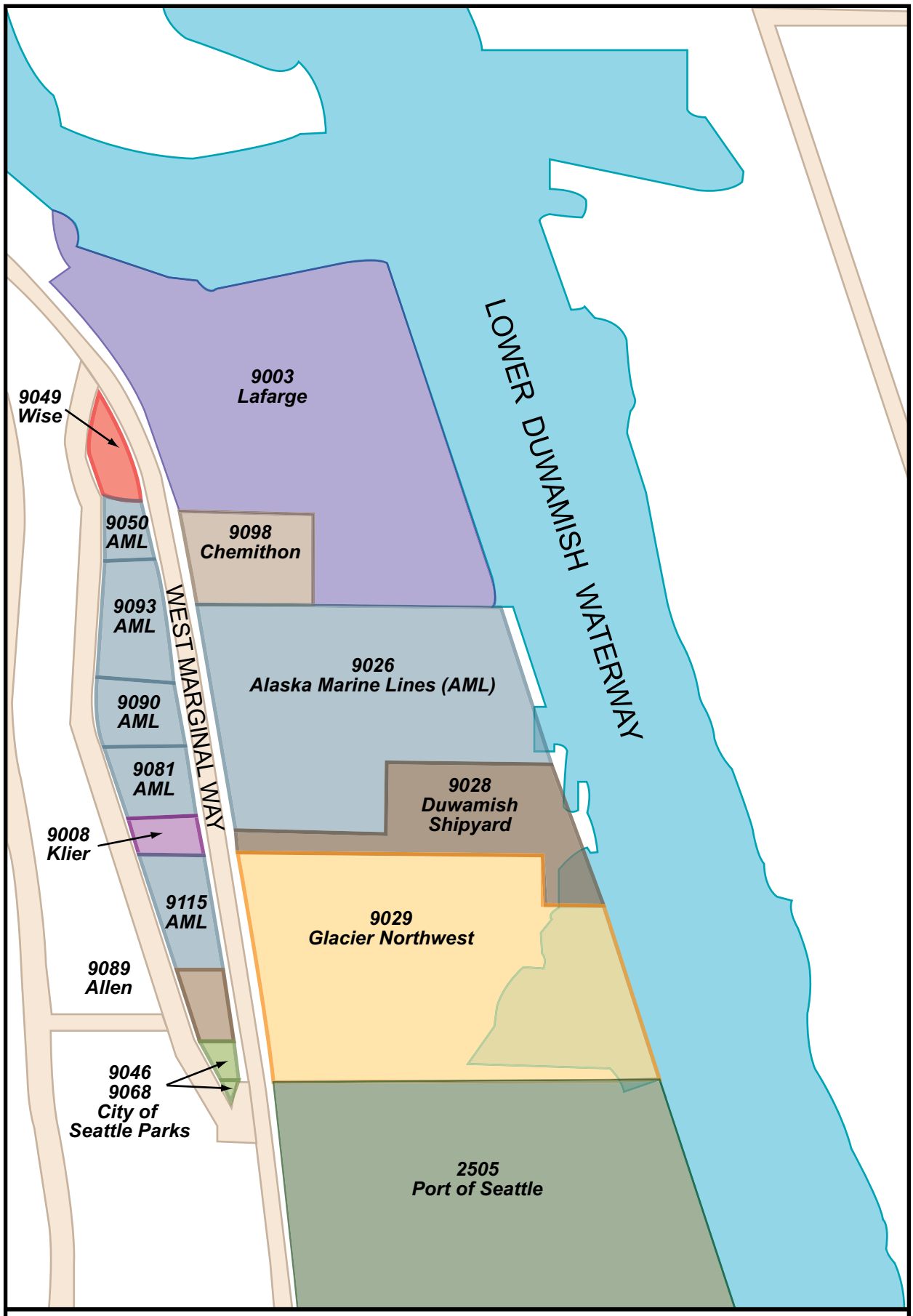
Figure 2. Glacier Bay Source Control Area

N

0 25 50 100 150 200 Meters

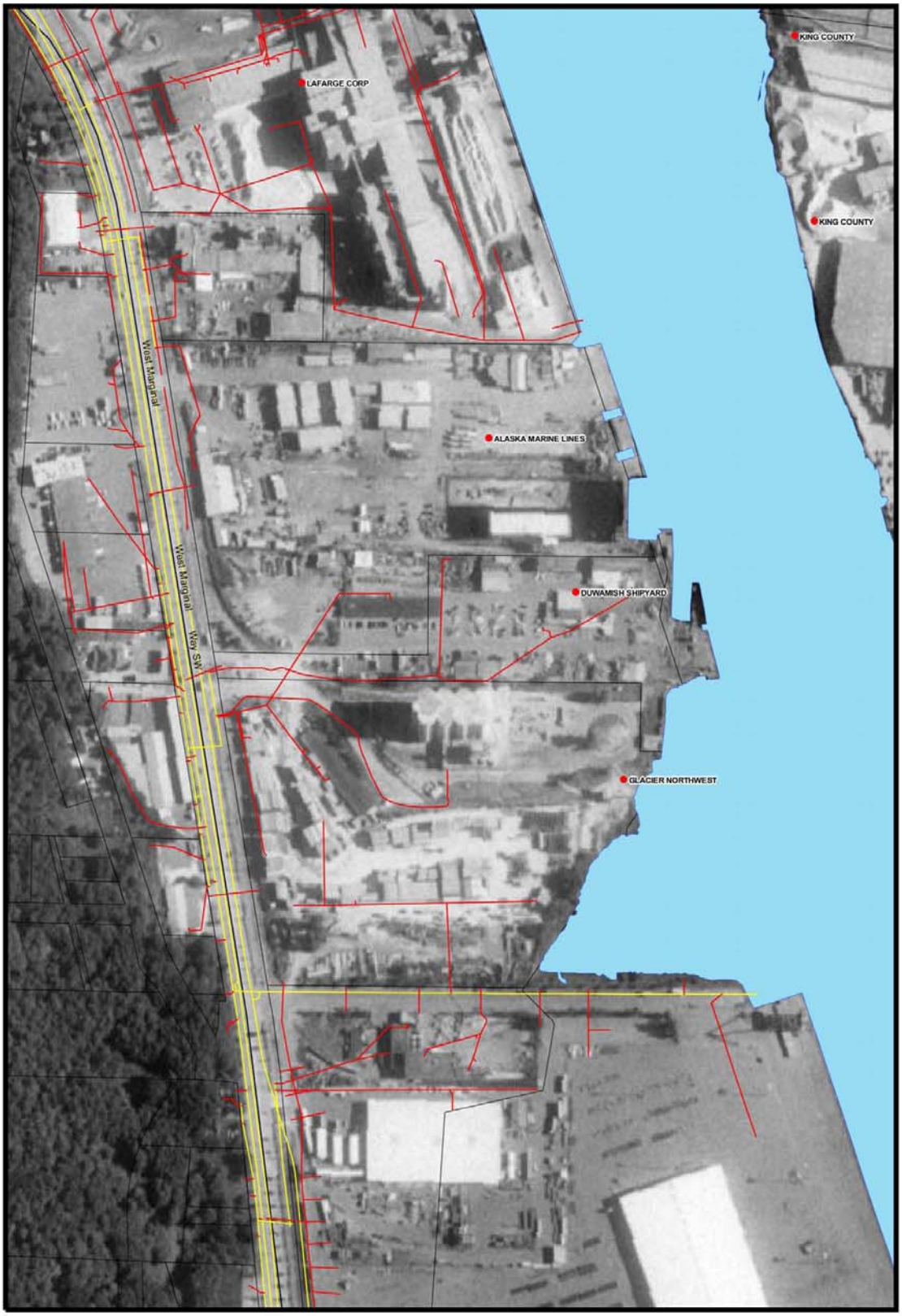
SAIC
From Science to Solutions

Figure 3. Glacier Bay Sediment Sample Locations



SAIC
From Science to Solutions

Figure 4. Parcel Ownership for Glacier Bay Source Control Area



Miles

0 0.05 0.1 0.2

N W E S

Storm Drain Lines

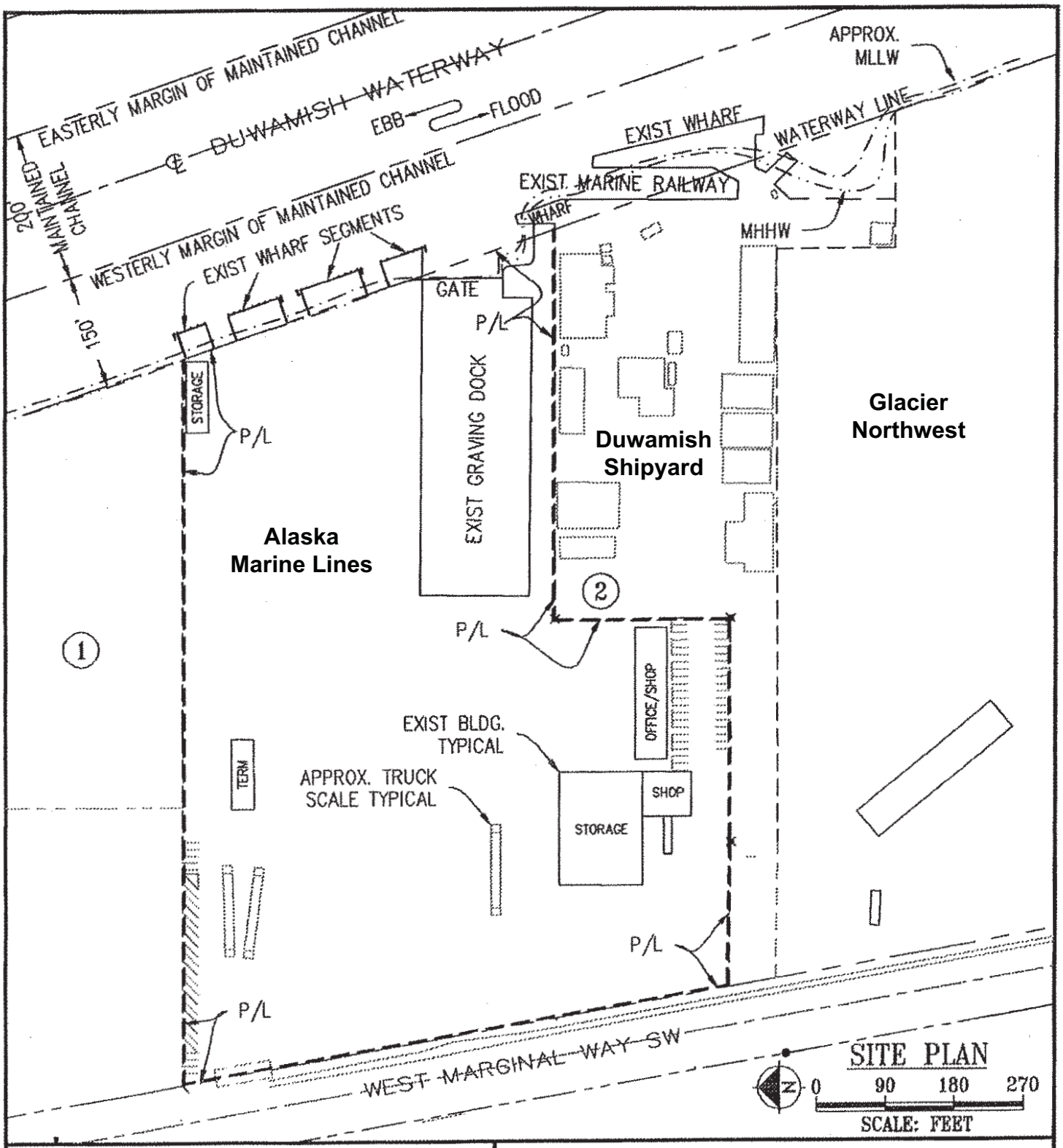
Duwamish Lateral Lines

Duwamish Main Lines

SAIC From Science to Solutions

Figure 5. Storm Drain Lines at Glacier Bay Source Control Area

Source: Seattle Public Utilities



APPLICANT: Alaska Marine Lines

PURPOSE: Expand Existing Intermodal Terminal

DATUM: MLLW

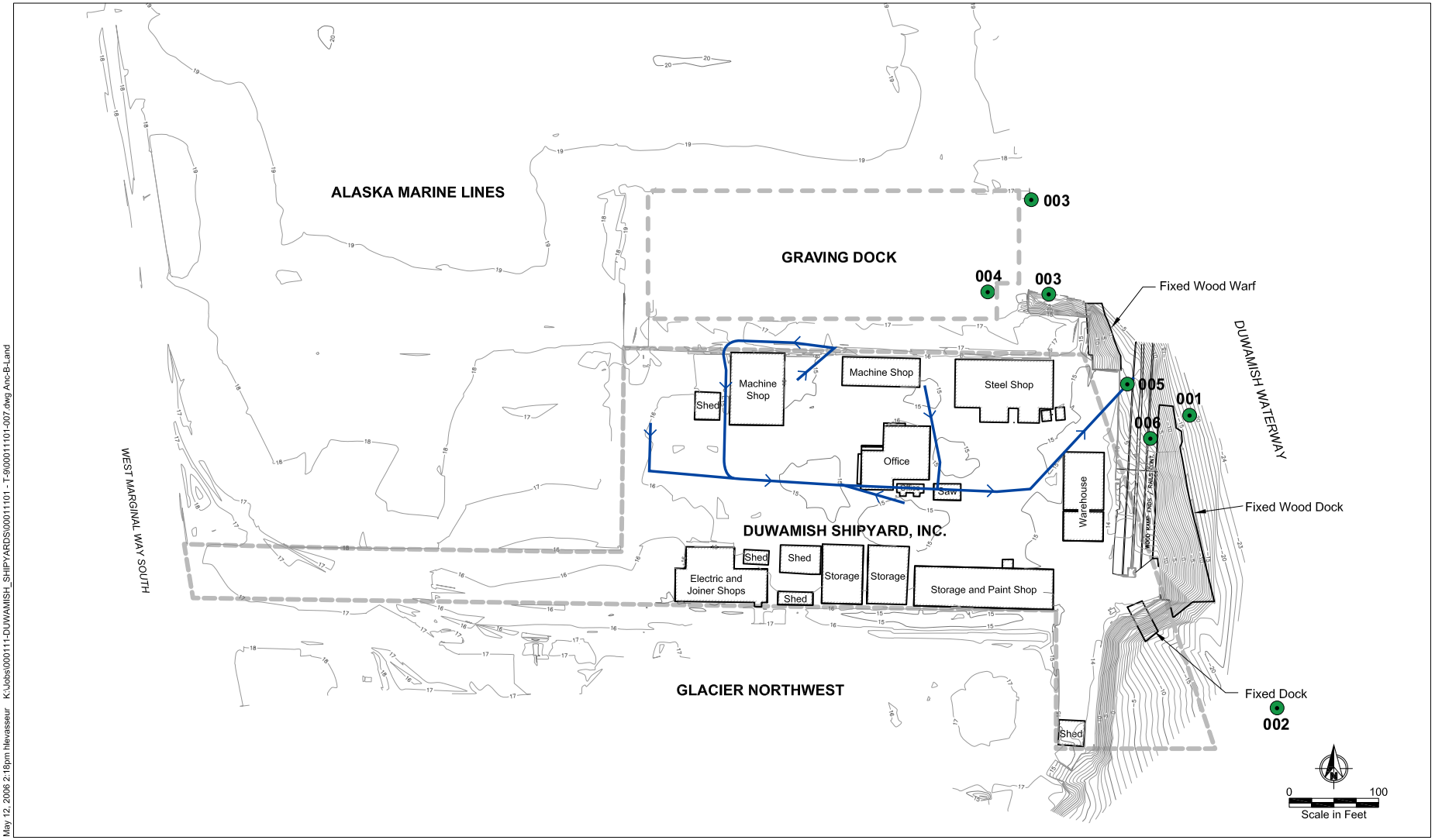
APPLICATION #: 200501087

IN: Duwamish Waterway. CITY: Seattle
COUNTY: King STATE: Washington

DATE: 9/12/2005 SHEET 2 OF 4

SAIC From Science to Solutions

Figure 6. Alaska Marine Lines
Source: Spearman Engineering 2005



May 12, 2006 2:18pm hlevasseur K:\Jobs\000111-DUWAMISH_SHIPYARDS\00011101 - T-9\00011101-007.dwg Anc-B-Land

Note: Preparation assistance provided by Anchor Environmental, L.L.C.

DUWAMISH SHIPYARD INC.

Subject Property Boundary
10 Ground Elevation Contour in Feet (in MLLW)
001 NPDES Discharge Sampling Location and Outfall Number
Stormwater Drainage System and Flow Direction

Current Property Boundary
Duwamish Shipyard, Inc.
Seattle, Washington

SAIC From Science to Solutions

Figure 7. Duwamish Shipyard
Source: Anchor Environmental, LLC. 2006

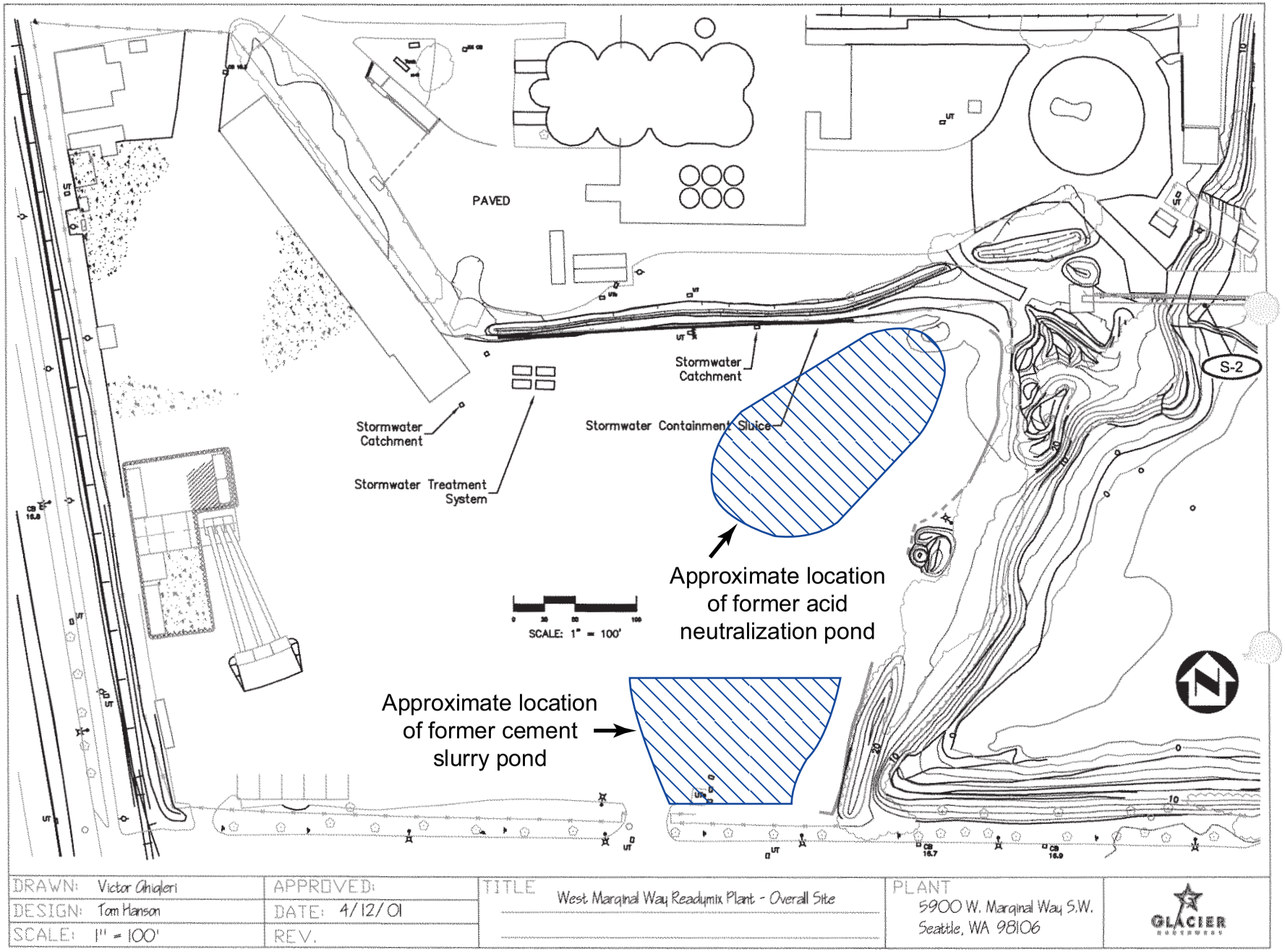


Figure 8. Glacier Northwest

Source: Glacier Northwest 2001, Parametrix, Inc. 1990

SAIC From Science to Solutions

Stormwater Outfall

Not to Scale

SAIC
From Science to Solutions

Figure 9. MRI Corporation

Source: Ecology & Environment, Inc. 1988, Harbor Engineering Co. 2004

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Tables

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Table 1
Chemicals above Screening Levels in Surface Sediment
Glacier Bay Source Control Area

Source	Sample Location	Chemical	Conc'n (mg/kg DW)	TOC (%)	Conc'n (mg/kg OC)	SQS	CSL	Units	SQS Exceedance Factor	CSL Exceedance Factor
Metals and trace elements										
LDWG 2005a	**LDW-SS48**	**Arsenic**	**807**		**NA**	**57**	**93**	**mg/kg DW**	**14**	8.7
LDWG 2005a	LDW-SS49	Arsenic	171		NA	57	93	mg/kg DW	3.0	1.8
LDWG 2005b	LDW-SS47	Arsenic	161		NA	57	93	mg/kg DW	2.8	1.7
LDWG 2005a	LDW-SS56	Arsenic	161		NA	57	93	mg/kg DW	2.8	1.7
LDWG 2005b	LDW-SS46	Arsenic	71		NA	57	93	mg/kg DW	1.2	
LDWG 2005a	LDW-SS48	Copper	1,420		NA	390	390	mg/kg DW	3.6	3.6
LDWG 2005b	LDW-SS47	Copper	1,340		NA	390	390	mg/kg DW	3.4	3.4
LDWG 2005b	LDW-SS46	Copper	1,230		NA	390	390	mg/kg DW	3.2	3.2
LDWG 2005a	LDW-SS49	Copper	605		NA	390	390	mg/kg DW	1.6	1.6
LDWG 2005a	LDW-SS48	Lead	780		NA	450	530	mg/kg DW	1.7	1.5
LDWG 2005a	LDW-SS48	Mercury	0.79		NA	0.41	0.59	mg/kg DW	1.9	1.3
LDWG 2005a	LDW-SS48	Zinc	2,830		NA	410	960	mg/kg DW	6.9	2.9
LDWG 2005b	LDW-SS47	Zinc	878		NA	410	960	mg/kg DW	2.1	
LDWG 2005b	LDW-SS46	Zinc	794		NA	410	960	mg/kg DW	1.9	
LDWG 2005a	LDW-SS49	Zinc	768		NA	410	960	mg/kg DW	1.9	
LDWG 2005a	LDW-SS56	Zinc	607		NA	410	960	mg/kg DW	1.5	
PAHs										
LDWG 2005a	LDW-SS48	Acenaphthene	0.23	1.36	17	16	57	mg/kg OC	1.1	
Weston 1999	DR120 (686)	Chrysene	3.3	2.78	119	100	460	mg/kg OC	1.2	
LDWG 2005a	LDW-SS48	Chrysene	1.9	1.36	140	100	460	mg/kg OC	1.4	
Weston 1999	DR120 (686)	Fluoranthene	14	2.78	504	160	1,200	mg/kg OC	3.1	
LDWG 2005a	LDW-SS48	Fluoranthene	2.9	1.36	213	160	1,200	mg/kg OC	1.3	
Weston 1999	DR120 (686)	Phenanthrene	3.9	2.78	140	100	480	mg/kg OC	1.4	
LDWG 2005a	LDW-SS48	Phenanthrene	1.7	1.36	125	100	480	mg/kg OC	1.3	
Weston 1999	DR120 (686)	Total HPAH (calc'd)	29.1	2.78	1,048	960	5,300	mg/kg OC	1.1	
Phthalates										
LDWG 2005b	LDW-SS46	Bis(2-ethylhexyl)phthalate	1.6	2.07	77	47	78	mg/kg OC	1.6	
LDWG 2005a	LDW-SS48	Bis(2-ethylhexyl)phthalate	0.77	1.36	57	47	78	mg/kg OC	1.2	
Weston 1999	DR126 (692)	Butyl benzyl phthalate	0.46	3.09	15	5	64	mg/kg OC	3.0	
LDWG 2005a	LDW-SS48	Butyl benzyl phthalate	0.071	1.36	5.2	4.9	64	mg/kg OC	1.1	

Table 1
Chemicals above Screening Levels in Surface Sediment
Glacier Bay Source Control Area

Source	Sample Location	Chemical	Conc'n (mg/kg DW)	TOC (%)	Conc'n (mg/kg OC)	SQS	CSL	Units	SQS Exceedance Factor	CSL Exceedance Factor
Other SVOCs										
LDWG 2005b	LDW-SSB4a	Pentachlorophenol	0.41	1.82	NA	360	690	µg/kg DW	1.1	
PCBs										
LDWG 2005b	LDW-SSB4a	PCBs (total-calc'd)	0.81	1.82	45	12	65	mg/kg OC	3.7	
LDWG 2005a	LDW-SS56	PCBs (total-calc'd)	0.75 J	1.13	66	12	65	mg/kg OC	5.5	
LDWG 2005a	LDW-SS57	PCBs (total-calc'd)	0.75 J	1.73	43	12	65	mg/kg OC	3.6	
LDWG 2005a	LDW-SS58	PCBs (total-calc'd)	0.26 J	1.78	15	12	65	mg/kg OC	1.2	

DW - Dry weight
TOC - Total organic carbon
OC - Organic carbon normalized
SQS - Sediment Quality Standard
CSL - Cleanup Screening Level

NA - Not applicable
PAH - Polynuclear aromatic hydrocarbon
SVOC - Semivolatile organic compound
PCB - polychlorinated biphenyl

Exceedance factors are the ratio of the detected concentration to the CSL or SQS; exceedance factors are shown only if they are greater than 1. Chemicals with exceedance factors greater than 10 are shown in **Bold**

Table 2
Chemicals above Screening Levels in Subsurface Sediment
Glacier Bay Source Control Area

Source	Sample Location	Chemical	Conc'n (mg/kg DW)		TOC (%)	Conc'n (mg/kg OC)	SQS	CSL	Units	SQS Exceedance Factor	CSL Exceedance Factor
Metals and trace elements											
LDWG 2007	LDW-SC26-6-8	Antimony	280	J		NA	150	200	mg/kg DW	1.9	1.4
LDWG 2007	**LDW-SC26-6-8**	**Arsenic**	**1,890**			**NA**	**57**	**93**	**mg/kg DW**	**33**	**20**
LDWG 2007	**LDW-SC28-5.5-7.5**	**Arsenic**	**760**			**NA**	**57**	**93**	**mg/kg DW**	**13**	8.2
LDWG 2007	LDW-SC25-4-6	Arsenic	250			NA	57	93	mg/kg DW	4.4	2.7
LDWG 2007	LDW-SC25-2-4	Arsenic	170			NA	57	93	mg/kg DW	3.0	1.8
LDWG 2007	LDW-SC28-0-1	Arsenic	114			NA	57	93	mg/kg DW	2.0	1.2
LDWG 2007	LDW-SC25-1-2	Arsenic	91			NA	57	93	mg/kg DW	1.6	
LDWG 2007	LDW-SC26-2-4	Arsenic	67			NA	57	93	mg/kg DW	1.2	
LDWG 2007	LDW-SC26-6-8	Copper	1,950			NA	390	390	mg/kg DW	5.0	5.0
LDWG 2007	LDW-SC28-5.5-7.5	Copper	1,480			NA	390	390	mg/kg DW	3.8	3.8
LDWG 2007	LDW-SC25-4-6	Copper	663			NA	390	390	mg/kg DW	1.7	1.7
LDWG 2007	LDW-SC26-2-4	Copper	544			NA	390	390	mg/kg DW	1.4	1.4
LDWG 2007	LDW-SC25-2-4	Copper	541			NA	390	390	mg/kg DW	1.4	1.4
LDWG 2007	LDW-SC26-6-8	Lead	1,350			NA	450	530	mg/kg DW	3.0	2.5
LDWG 2007	LDW-SC28-5.5-7.5	Lead	583			NA	450	530	mg/kg DW	1.3	1.1
LDWG 2007	**LDW-SC26-6-8**	**Mercury**	**4.34**			**NA**	**0.41**	**0.59**	**mg/kg DW**	**11**	7.4
LDWG 2007	LDW-SC28-5.5-7.5	Mercury	0.72			NA	0.41	0.59	mg/kg DW	1.8	1.2
LDWG 2007	LDW-SC26-2-4	Mercury	0.69	J		NA	0.41	0.59	mg/kg DW	1.7	1.2
LDWG 2007	LDW-SC26-6-8	Zinc	3,700			NA	410	960	mg/kg DW	9.0	3.9
LDWG 2007	LDW-SC28-5.5-7.5	Zinc	1,880			NA	410	960	mg/kg DW	4.6	2.0
LDWG 2007	LDW-SC25-4-6	Zinc	1,420			NA	410	960	mg/kg DW	3.5	1.5
LDWG 2007	LDW-SC25-2-4	Zinc	750			NA	410	960	mg/kg DW	1.8	
LDWG 2007	LDW-SC25-1-2	Zinc	503			NA	410	960	mg/kg DW	1.2	
PAHs											
LDWG 2007	LDW-SC26-6-8	Acenaphthene	0.90		1.88	48	16	57	mg/kg OC	3.0	
LDWG 2007	LDW-SC26-6-8	Benzo(a)anthracene	3.7		1.88	197	110	270	mg/kg OC	1.8	
LDWG 2007	LDW-SC26-6-8	Benzo(a)pyrene	2.8		1.88	149	99	210	mg/kg OC	1.5	
LDWG 2007	LDW-SC26-6-8	Benzo(g,h,i)perylene	1.0		1.88	53	31	78	mg/kg OC	1.7	
LDWG 2007	LDW-SC26-6-8	Benzofluoranthenes (total)	5.2		1.88	277	230	450	mg/kg OC	1.2	
LDWG 2007	LDW-SC26-6-8	Chrysene	3.9		1.88	207	110	460	mg/kg OC	1.9	

Table 2
Chemicals above Screening Levels in Subsurface Sediment
Glacier Bay Source Control Area

Source	Sample Location	Chemical	Conc'n (mg/kg DW)		TOC (%)	Conc'n (mg/kg OC)	SQS	CSL	Units	SQS Exceedance Factor	CSL Exceedance Factor
LDWG 2007	LDW-SC26-6-8	Dibenzo(a,h)anthracene	0.40	J	1.88	21	12	33	mg/kg OC	1.8	
LDWG 2007	LDW-SC26-6-8	Dibenzofuran	0.36		1.88	19	15	58	mg/kg OC	1.3	
LDWG 2007	LDW-SC26-6-8	Fluoranthene	10		1.88	532	160	1,200	mg/kg OC	3.3	
LDWG 2007	LDW-SC28-5.5-7.5	Fluoranthene	4.1		1.61	255	160	1,200	mg/kg OC	1.6	
LDWG 2007	LDW-SC26-6-8	Indeno(1,2,3-cd)pyrene	1.0		1.88	53	34	88	mg/kg OC	1.6	
LDWG 2007	LDW-SC26-6-8	Phenanthrene	5.6		1.88	298	100	480	mg/kg OC	3.0	
LDWG 2007	LDW-SC28-5.5-7.5	Phenanthrene	1.7		1.61	106	100	480	mg/kg OC	1.1	
LDWG 2007	LDW-SC26-6-8	Total HPAH	38	J	1.88	2,021	960	5,300	mg/kg OC	2.1	
LDWG 2007	LDW-SC26-6-8	Total LPAH	8.5	J	1.88	452	370	780	mg/kg OC	1.2	
Phthalates											
LDWG 2007	LDW-SC26-6-8	Bis(2-ethylhexyl)phthalate	3.8		1.88	202	47	78	mg/kg OC	4.3	2.6
LDWG 2007	LDW-SC28-5.5-7.5	Bis(2-ethylhexyl)phthalate	1.0		1.61	62	47	78	mg/kg OC	1.3	
SVOCs											
LDWG 2007	LDW-SC28-5.5-7.5	1,2-Dichlorobenzene	0.16		1.61	10	2.3	2.3	mg/kg OC	4.3	4.3
LDWG 2007	LDW-SC26-6-8	1,2-Dichlorobenzene	0.073		1.88	3.9	2.3	2.3	mg/kg OC	1.7	1.7
LDWG 2007	LDW-SC28-0-1	Benzyl alcohol	0.11		2.59	NA	57	73	µg/kg DW	1.9	1.5
LDWG 2007	LDW-SC26-6-8	Pentachlorophenol	0.80		1.88	NA	360	690	µg/kg DW	2.2	1.2
LDWG 2007	LDW-SC28-5.5-7.5	Pentachlorophenol	0.41		1.61	NA	360	690	µg/kg DW	1.1	
PCBs											
LDWG 2007	**LDW-SC28-5.5-7.5**	**PCBs (total-calc'd)**	**3.2**		**1.61**	**199**	**12**	**65**	**mg/kg OC**	**16.7**	3.1
LDWG 2007	**LDW-SC26-6-8**	**PCBs (total-calc'd)**	**2.3**		**1.88**	**122**	**12**	**65**	**mg/kg OC**	**10.0**	1.8
LDWG 2007	LDW-SC25-4-6	PCBs (total-calc'd)	0.80	J	1.63	49	12	65	mg/kg OC	4.1	
LDWG 2007	LDW-SC28-12-12.6	PCBs (total-calc'd)	0.54		1.31	41	12	65	mg/kg OC	3.4	
LDWG 2007	LDW-SC25-2-4	PCBs (total-calc'd)	0.43		1.69	25	12	65	mg/kg OC	2.1	
LDWG 2007	LDW-SC25-1-2	PCBs (total-calc'd)	0.36		1.47	24	12	65	mg/kg OC	2.0	
LDWG 2007	LDW-SC26-0-1	PCBs (total-calc'd)	0.28		1.40	20	12	65	mg/kg OC	1.7	
LDWG 2007	LDW-SC28-0-1	PCBs (total-calc'd)	0.44		2.59	17	12	65	mg/kg OC	1.4	
LDWG 2007	LDW-SC28-1-2	PCBs (total-calc'd)	0.36	J	2.07	17	12	65	mg/kg OC	1.4	
LDWG 2007	LDW-SC25-0-1	PCBs (total-calc'd)	0.31		1.94	16	12	65	mg/kg OC	1.3	
LDWG 2007	LDW-SC26-11-12	PCBs (total-calc'd)	0.14		0.91	15	12	65	mg/kg OC	1.3	
LDWG 2007	LDW-SC26-2-4	PCBs (total-calc'd)	0.31		2.08	15	12	65	mg/kg OC	1.3	

Table 2
Chemicals above Screening Levels in Subsurface Sediment
Glacier Bay Source Control Area

Source	Sample Location	Chemical	Conc'n (mg/kg DW)		TOC (%)	Conc'n (mg/kg OC)	SQS	CSL	Units	SQS Exceedance Factor	CSL Exceedance Factor
LDWG 2007	LDW-SC26-1-2	PCBs (total-calc'd)	0.23		1.99	14	12	65	mg/kg OC	1.3	
LDWG 2007	LDW-SC24-0-1	PCBs (total-calc'd)	0.28		1.99	14	12	65	mg/kg OC	1.2	

DW - Dry weight
TOC - Total organic carbon
OC - Organic carbon normalized
SQS - Sediment Quality Standard
CSL - Cleanup Screening Level

NA - Not applicable
PAH - Polynuclear aromatic hydrocarbon
SVOC - Semivolatile organic compound
PCB - polychlorinated biphenyl

Exceedance factors are the ratio of the detected concentration to the CSL or SQS; exceedance factors are shown only if they are greater than 1. Chemicals with exceedance factors greater than 10 are shown in **Bold.**

Table 3
Chemicals above Screening Levels in Soil
Alaska Marine Lines

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)		MTCA Cleanup Level[a] (mg/kg DW)	Soil-to-Sediment Screening Level (Based on CSL)[b] (mg/kg DW)	Exceedance Factor
Dames & Moore 1991c	Dec-90	SS-1		Benzene	0.24		0.03	NA	8.0
ESL 1993	**Aug-93**	**TP-3**		**Benzene**	**1.3**		**0.03**	NA	**43**
ESL 1993	Aug-93	TP-3		Ethylbenzene	9		6	NA	1.5
Hart Crowser 1994	**Oct-93**	**NE-W4-0**		**Ethylbenzene**	**350**		**6**	NA	**58**
ESL 1993	Aug-93	TP-3		Xylenes (total)	12		9	NA	1.3
Hart Crowser 1994	**Oct-93**	**NE-W4-0**		**Xylenes (total)**	**1,200**		**9**	NA	**133**
Dames & Moore 1991c	Dec-90	SS-1		Diesel-Range Hydrocarbons	14,000		2,000	NA	7.0
Dames & Moore 1991c	Dec-90	SS-2		Diesel-Range Hydrocarbons	15,000		2,000	NA	7.5
Dames & Moore 1991c	Dec-90	SS-3		Diesel-Range Hydrocarbons	4,400		2,000	NA	2.2
ESL 1993	Aug-93	TP-3		Diesel-Range Hydrocarbons	>50		2,000	NA	
ESL 1993	Aug-93	TP-3		Diesel-Range Hydrocarbons	>50		2,000	NA	
Hart Crowser 1994	Oct-93	NE-W4-0		Diesel-Range Hydrocarbons	12,000		2,000	NA	6.0
Hart Crowser 1994	Oct-93	E-W4-NE30		Diesel-Range Hydrocarbons	17,000		2,000	NA	8.5
Hart Crowser 1994	Jan-94	B1-S2	7-8.5	Diesel-Range Hydrocarbons	3,400		2,000	NA	1.7
Dames & Moore 1991c	**Dec-90**	**SS-1**		**Gasoline-Range Hydrocarbons**	**1,600**		**30**	NA	**53**
Dames & Moore 1991c	**Dec-90**	**SS-2**		**Gasoline-Range Hydrocarbons**	**1,400**		**30**	NA	**47**
Dames & Moore 1991c	**Dec-90**	**SS-3**		**Gasoline-Range Hydrocarbons**	**560**		**30**	NA	**19**
ESL 1993	Aug-93	TP-3		Gasoline-Range Hydrocarbons	>20		30	NA	
ESL 1993	Aug-93	TP-3		Gasoline-Range Hydrocarbons	>20		30	NA	
Hart Crowser 1994	**Oct-93**	**NE-W4-0**		**Gasoline-Range Hydrocarbons**	**570**		**30**	NA	**19**
ESL 1993	Aug-93	TP-3		Heavy-Oil Range Hydrocarbons	>100		2,000	NA	
ESL 1993	Aug-93	TP-3		Heavy-Oil Range Hydrocarbons	>100		2,000	NA	
Hart Crowser 1994	**Oct-93**	**NE-W4-0**		**Total Petroleum Hydrocarbons**	**13,000**		**200**	NA	**65**
Hart Crowser 1994	**Oct-93**	**E-W4-NE30**		**Total Petroleum Hydrocarbons**	**11,000**		**200**	NA	**55**
Hart Crowser 1994	Oct-93	C-B7		Total Petroleum Hydrocarbons	1,100		200	NA	5.5
Hart Crowser 1994	Oct-93	N-W4		Total Petroleum Hydrocarbons	480		200	NA	2.4
ESL 1993	**Aug-93**	**TP-3**		**Acenaphthene**	**21**		NA	**1.2**	**18**
Hart Crowser 1994	Oct-93	NE-W4-0		Acenaphthene	3.2		NA	1.2	2.7

Table 3
Chemicals above Screening Levels in Soil
Alaska Marine Lines

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)		MTCA Cleanup Level[a] (mg/kg DW)	Soil-to-Sediment Screening Level (Based on CSL)[b] (mg/kg DW)	Exceedance Factor
Hart Crowser 1994	Oct-93	E-W4-NE30		Acenaphthene	4.1		NA	1.2	3.4
Hart Crowser 1994	Oct-93	SP-D1		Acenaphthene	2.1		NA	1.2	1.8
ESL 1993	**Aug-93**	**TP-3**		**Acenaphthylene**	**28**		NA	**1.4**	**20**
ESL 1993	Aug-93	TP-3		Anthracene	130		NA	24	5.4
ESL 1993	**Aug-93**	**TP-3**		**Benzo(a)anthracene**	**19**		**0.14**	5.4	**136**
ESL 1993	**Aug-93**	**TP-3**		**Benzo(b)fluoranthene**	**15**		**0.14**	9.0	**107**
ESL 1993	**Aug-93**	**TP-3**		**Benzo(k)fluoranthene**	**15**		**0.14**	9.0	**107**
ESL 1993	Aug-93	TP-3		Benzo(g,h,i)perylene	11	J	NA	1.6	6.9
Hart Crowser 1994	Jan-94	B1-S2		Benzo(g,h,i)perylene	1.6		NA	1.6	1.0
ESL 1993	**Aug-93**	**TP-3**		**Benzo(a)pyrene**	**18**		**0.14**	4.2	**129**
ESL 1993	Aug-93	TP-3		Chrysene	28		NA	9.2	3.0
ESL 1993	Aug-93	TP-3		Dibenzo(a,h)anthracene	2.6	J	NA	0.66	3.9
ESL 1993	**Aug-93**	**TP-3**		**Dibenzofuran**	**16**		NA	**1.2**	**13**
Hart Crowser 1994	Oct-93	NE-W4-0		Dibenzofuran	2.1		NA	1.2	1.8
Hart Crowser 1994	Oct-93	E-W4-NE30		Dibenzofuran	2.9		NA	1.2	2.4
ESL 1993	**Aug-93**	**TP-3**		**Fluorene**	**58**		NA	**1.6**	**36**
Hart Crowser 1994	Oct-93	NE-W4-0		Fluorene	6.8		NA	1.6	4.3
Hart Crowser 1994	Oct-93	E-W4-NE30		Fluorene	8.9		NA	1.6	5.6
Hart Crowser 1994	Oct-93	SP-D1		Fluorene	2.0		NA	1.6	1.3
Hart Crowser 1994	Jan-94	B1-S2	7-8.5	Fluorene	7.1		NA	1.6	4.4
ESL 1993	Aug-93	TP-3		Indeno(1,2,3-cd)pyrene	9.2	J	NA	1.8	5.1
ESL 1993	**Aug-93**	**TP-3**		**2-Methylnaphthalene**	**250**		NA	**1.4**	**179**
Hart Crowser 1994	Oct-93	NE-W4-0		2-Methylnaphthalene	10		NA	1.4	7.1
Hart Crowser 1994	**Oct-93**	**E-W4-NE30**		**2-Methylnaphthalene**	**30**		NA	**1.4**	**21**
Hart Crowser 1994	Oct-93	SP-D1		2-Methylnaphthalene	3.2		NA	1.4	2.3
ESL 1993	**Aug-93**	**TP-3**		**Naphthalene**	**200**		5	**3.8**	**53**
Hart Crowser 1994	Oct-93	E-W4-NE30		Naphthalene	19		5	3.8	5.0
ESL 1993	**Aug-93**	**TP-3**		**Phenanthrene**	**150**		NA	**9.7**	**15**

Table 3
Chemicals above Screening Levels in Soil
Alaska Marine Lines

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)		MTCA Cleanup Level[a] (mg/kg DW)	Soil-to-Sediment Screening Level (Based on CSL)[b] (mg/kg DW)	Exceedance Factor
Hart Crowser 1994	Oct-93	NE-W4-0		Phenanthrene	17		NA	9.7	1.8
Hart Crowser 1994	Oct-93	E-W4-NE30		Phenanthrene	24		NA	9.7	2.5
Hart Crowser 1994	Jan-94	B1-S2		Phenanthrene	22		NA	9.7	2.3
ESL 1993	Aug-93	TP-3		Pyrene	38		NA	28	1.4

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database
b - Soil to groundwater to sediment screening value for vadose zone soils, based on sediment CSL. From: SAIC 2006

DW - dry weight
CSL - Contaminant Screening Level from Washington Sediment Management Standards
NA - Not available

Notes:

(1) Table presents detected chemicals only
(2) ESL 1993 data is as cited in Hart Crowser 1994. Original ESL report and laboratory data were not available for review.
(3) Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Value, whichever is lower. Only samples with exceedance factors greater than or equal to 1 are shown.
(4) Chemicals with exceedance factors greater than 10 are shown in **Bold**

Table 4
Chemicals above Screening Levels in Groundwater
Alaska Marine Lines

Source	Sample Date	Sample Location	Chemical	Groundwater Conc'n (ug/L)	MTCA Cleanup Level[a] (ug/L)	GW-to-Sediment Screening Level[b] (Based on CSL) (ug/L)	Exceedance Factor
Dames & Moore 1991c	**Dec-90**	**H2O-1**	**Benzene**	**330**	**5**	NA	**66**
Dames & Moore 1991c	Dec-90	H2O-1	Diesel-Range Hydrocarbons	4,900	500	NA	9.8
ESL 1993	Aug-93	MW-2	Diesel-Range Hydrocarbons	>50	500	NA	
ESL 1993	Aug-93	MW-2	Diesel-Range Hydrocarbons	>50	500	NA	
ESL 1993	Aug-93	MW-2	Diesel-Range Hydrocarbons	>50	500	NA	
ESL 1993	Aug-93	MW-3	Diesel-Range Hydrocarbons	>50	500	NA	
ESL 1993	Aug-93	MW-3	Diesel-Range Hydrocarbons	>50	500	NA	
ESL 1993	Aug-93	MW-2	Gasoline-Range Hydrocarbons	>20	800	NA	
ESL 1993	Aug-93	MW-3	Gasoline-Range Hydrocarbons	>20	800	NA	
ESL 1993	Aug-93	MW-3	Gasoline-Range Hydrocarbons	980	800	NA	1.2
ESL 1993	Aug-93	MW-2	Heavy-Oil Range Hydrocarbons	>100	500	NA	
ESL 1993	Aug-93	MW-2	Heavy-Oil Range Hydrocarbons	>100	500	NA	
ESL 1993	Aug-93	MW-3	Heavy-Oil Range Hydrocarbons	>100	500	NA	
ESL 1993	Aug-93	MW-3	Heavy-Oil Range Hydrocarbons	>100	500	NA	
ESL 1993	Aug-93	MW-4	Heavy-Oil Range Hydrocarbons	>100	500	NA	
ESL 1993	Aug-93	SB	Heavy-Oil Range Hydrocarbons	>100	500	NA	
Dames & Moore 1991c	Dec-90	H2O-1	Xylenes (total)	1,200	1,000	NA	1.2

a - MTCA cleanup level is the lower of the MTCA Method A and B cleanup levels. Cyanide does not have a MTCA cleanup level, therfore the MCL was used.
b - Groundwater to sediment screening value, based on sediment CSLs. From: SAIC 2006

Notes:
(1) ESL 1993 data is as cited in Hart Crowser 1994. Original ESL report and laboratory data were not available for review.
(2) Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or GW-to-Sediment Screening Value, whichever is lower. Only samples with exceedance factors greater than 1 are shown.
(3) Chemicals with exceedance factors greater than 10 are shown in **Bold**

Table 5
Chemicals above Screening Levels in Sediment Samples
Duwamish Shipyard, Inc.

Source	Sample Location	Chemical	Conc'n (mg/kg DW)		TOC (%)	Conc'n (mg/kg OC)	SQS	CSL	Units	SQS Exceedance Factor	CSL Exceedance Factor
Metals and trace elements											
Hart Crowser 1993c	**SS-2**	**Arsenic**	**1,130**			**NA**	**57**	**93**	**mg/kg DW**	**20**	**12**
Hart Crowser 1993c	SS-4	Arsenic	120			NA	57	93	mg/kg DW	2.1	1.3
Hart Crowser 1993c	SS-3	Arsenic	75			NA	57	93	mg/kg DW	1.3	
Hart Crowser 1993c	SS-2	Copper	1,970	J		NA	390	390	mg/kg DW	5.1	5.1
Hart Crowser 1993c	SS-3	Copper	507	J		NA	390	390	mg/kg DW	1.3	1.3
Hart Crowser 1993c	SS-2	Lead	854	J		NA	450	530	mg/kg DW	1.9	1.6
Hart Crowser 1993c	**SS-2**	**Zinc**	**4,440**			**NA**	**410**	**960**	**mg/kg DW**	**11**	4.6
Hart Crowser 1993c	SS-4	Zinc	526	J		NA	410	960	mg/kg DW	1.3	
Hart Crowser 1993c	SS-3	Zinc	418	J		NA	410	960	mg/kg DW	1.0	
PAHs											
Hart Crowser 1993c	SS-2	Acenaphthene	0.84		2.74	31	16	57	mg/kg OC	1.9	
Hart Crowser 1993c	SS-2	Dibenzofuran	0.66		2.74	24	15	58	mg/kg OC	1.6	
Hart Crowser 1993c	SS-2	Fluoranthene	10		2.74	354	160	1,200	mg/kg OC	2.2	
Hart Crowser 1993c	SS-2	Fluorene	1.2		2.74	44	23	79	mg/kg OC	1.9	
Hart Crowser 1993c	SS-2	Indeno(1,2,3-cd)pyrene	1.1		2.74	40	34	88	mg/kg OC	1.2	
Hart Crowser 1993c	SS-2	Phenanthrene	7.1		2.74	259	100	480	mg/kg OC	2.6	
Hart Crowser 1993c	SS-1	Phenanthrene	1.9		1.90	100	100	480	mg/kg OC	1.0	
Hart Crowser 1993c	SS-2	Total HPAH	27.4	J	2.74	988	960	5,300	mg/kg OC	1.0	
Hart Crowser 1993c	SS-2	Total LPAH	10.8		2.74	394	370	780	mg/kg OC	1.1	
Phthalates											
Hart Crowser 1993c	SS-4	Bis(2-ethylhexyl)phthalate	2.2		1.54	143	47	78	mg/kg OC	3.0	1.8
Hart Crowser 1993c	SS-2	Bis(2-ethylhexyl)phthalate	1.8		2.74	66	47	78	mg/kg OC	1.4	
Hart Crowser 1993c	SS-1	Bis(2-ethylhexyl)phthalate	1.0		1.90	53	47	78	mg/kg OC	1.1	
Hart Crowser 1993c	SS-3	Butyl benzyl phthalate	0.12		2.35	5.1	4.9	64	mg/kg OC	1.0	
Hart Crowser 1993c	SS-1	Butyl benzyl phthalate	0.096		1.90	5.1	4.9	64	mg/kg OC	1.0	

OC - Organic carbon normalized
DW - Dry weight

Exceedance factors are the ratio of the detected concentration to the CSL or SQS; exceedance factors are shown only if they are greater than or equal to 1.
Chemicals with exceedance factors greater than 10 are shown in **Bold**

Table 6
Chemicals above Screening Levels in Soil
Duwamish Shipyard, Inc.

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)		MTCA Cleanup Level[a] (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL)[b] (mg/kg)	Exceedance Factor
Kuroiwa 2000	**Aug-00**	**B4**		**Benzene**	**3.5**		**0.03**	NA	**117**
Kuroiwa 2000	**Aug-00**	**SS-2**		**Benzene**	**1.6**		**0.03**	NA	**53**
Kuroiwa 2000	**Aug-00**	**B1(2)**		**Benzene**	**0.70**		**0.03**	NA	**23**
Kuroiwa 2000	**Aug-00**	**B3**		**Benzene**	**0.40**		**0.03**	NA	**13**
Kuroiwa 2000	**Aug-00**	**SS-3(2)**		**Benzene**	**0.38**		**0.03**	NA	**13**
Anchor 2006b	Sep-06	DSI06-SO-A	0-3	Benzene	0.26		0.03	NA	8.7
Anchor 2006b	Sep-06	DSI07-SO-A	0-3	Benzene	0.05		0.03	NA	1.7
Kuroiwa 2000	Aug-00	B3(2)		Diesel-Range Hydrocarbons	4,000		2,000	NA	2.0
Anchor 2006b	Sep-06	DSI06-SO-A	0-3	Diesel-Range Hydrocarbons	2,700		2,000	NA	1.4
Anchor 2006b	Sep-06	DSI06-SO-B	4-6	Diesel-Range Hydrocarbons	2,200		2,000	NA	1.1
Kuroiwa 2000	**Aug-00**	**SS-3**		**Gasoline-Range Hydrocarbons**	**3,400**		**30**	NA	**113**
Kuroiwa 2000	**Aug-00**	**B1**		**Gasoline-Range Hydrocarbons**	**3,200**		**30**	NA	**107**
Kuroiwa 2000	**Aug-00**	**SS-2**		**Gasoline-Range Hydrocarbons**	**1,900**		**30**	NA	**63**
Kuroiwa 2000	**Aug-00**	**B4(1)**		**Gasoline-Range Hydrocarbons**	**800**		**30**	NA	**27**
Kuroiwa 2000	**Aug-00**	**SS-3(2)**		**Gasoline-Range Hydrocarbons**	**300**		**30**	NA	**10**
Anchor 2006b	Sep-06	DSI09-SO-B	3-5	Gasoline-Range Hydrocarbons	200		30	NA	6.7
Kuroiwa 2000	Aug-00	B3		Gasoline-Range Hydrocarbons	170		30	NA	5.7
Kuroiwa 2000	Aug-00	SS-1		Gasoline-Range Hydrocarbons	140		30	NA	4.7
Anchor 2006b	Sep-06	DSI06-SO-A	0-3	Gasoline-Range Hydrocarbons	120		30	NA	4.0
Anchor 2006b	Sep-06	DSI03-SO-B	5-6.5	Gasoline-Range Hydrocarbons	110		30	NA	3.7
Anchor 2006b	Sep-06	DSI03-SO-A	0-3	Gasoline-Range Hydrocarbons	92		30	NA	3.1
Kuroiwa 2000	Aug-00	B4		Gasoline-Range Hydrocarbons	88		30	NA	2.9
Kuroiwa 2000	Aug-00	SS-2(2)		Gasoline-Range Hydrocarbons	76		30	NA	2.5
Anchor 2006b	Sep-06	DSI07-SO-A	0-3	Gasoline-Range Hydrocarbons	74		30	NA	2.5
Anchor 2006b	Sep-06	DSI07-SO-B	3-5	Gasoline-Range Hydrocarbons	36		30	NA	1.2
Anchor 2006b	**Sep-06**	**DSI01-SO-A**	**0-3**	**Arsenic**	**48**	**J**	**0.67**	12,000	**72**

Table 6
Chemicals above Screening Levels in Soil
Duwamish Shipyard, Inc.

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)		MTCA Cleanup Level[a] (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL)[b] (mg/kg)	Exceedance Factor
Anchor 2006b	**Sep-06**	**DSI09-SO-B**	**3-5**	**Arsenic**	**20**		**0.67**	12,000	**30**
Anchor 2006b	**Sep-06**	**DSI12-SO-B**	**3-5**	**Benzo(a)pyrene**	**7.9**		**0.14**	4.2	**56**
Anchor 2006b	**Sep-06**	**DSI12-SO-A**	**0-3**	**Benzo(a)pyrene**	**3.0**		**0.14**	4.2	**21**
Anchor 2006b	Sep-06	DSI09-SO-B	3-5	Cadmium	8.5		2	34	4.3
Anchor 2006b	**Sep-06**	**DSI09-SO-B**	**3-5**	**Lead**	**4,940**		**250**	1,300	**20**

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database
b - From: SAIC 2006

DW - dry weight
CSL - Contaminant Screening Level from Washington Sediment Management Standards
NA - Not available

Notes:
(1) Table presents detected chemicals only
(2) Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Value, whichever is lower. Only samples with exceedance factors greater than or equal to 1 are shown.
(3) Chemicals with exceedance factors greater than 10 are shown in **Bold**

Table 7
Chemicals above Screening Levels in Catch Basin Solids Sample
Duwamish Shipyard, Inc.

Source	Date Sampled	Sample Location	Chemical	Conc'n	SQS	CSL	Units	SQS Exceedance Factor[a]	CSL Exceedance Factor[a]	MTCA Cleanup Level (mg/kg)	MTCA Exceedance Factor
Anchor 2006b	9/29/2006	DSI-22	Copper	2,450	390	390	mg/kg DW	6.3	6.3	3,000	
Anchor 2006b	9/29/2006	DSI-22	Mercury	1.05	0.41	0.59	mg/kg DW	2.6	1.8	24	
Anchor 2006b	9/29/2006	DSI-22	Zinc	2,600	410	960	mg/kg DW	6.3	2.7	24,000	
Anchor 2006b	9/29/2006	DSI-22	Acenaphthene	22.6 J	16	57	mg/kg OC	1.4		NA	
Anchor 2006b	9/29/2006	DSI-22	Bis(2-ethylhexyl)phthalate	488	47	78	mg/kg OC	5.9	3.5	71	
Anchor 2006b	9/29/2006	DSI-22	Butylbenzylphthalate	14.3	4.9	64	mg/kg OC	1.4		16,000	

OC - Organic carbon normalized
DW - Dry weight

a - Exceedance factors are the ratio of the detected concentration to the CSL or SQS; exceedance factors are shown only if they are greater than or equal to 1.

Table 8
Chemicals above Screening Levels in Groundwater
Duwamish Shipyard, Inc.

Source	Sample Date	Sample Location	Chemical	Groundwater Conc'n (ug/L)	MTCA Cleanup Level[a] (ug/L)	GW-to-Sediment Screening Level[b] (Based on CSL) (ug/L)	Exceedance Factor
Anchor 2006b	**Sep-06**	**DSI01-GW**	**Arsenic**	**84.4**	**0.058**	370	**1455**
Anchor 2006b	**Sep-06**	**DSI12-GW**	**Arsenic**	**32.5**	**0.058**	370	**560**
Anchor 2006b	**Sep-06**	**DSI02-GW**	**Arsenic**	**16.4**	**0.058**	370	**283**
Anchor 2006b	**Sep-06**	**DSI08-GW**	**Arsenic**	**11.8**	**0.058**	370	**203**
Anchor 2006b	**Sep-06**	**DSI04-GW**	**Arsenic**	**11.2**	**0.058**	370	**193**
Anchor 2006b	**Sep-06**	**DSI03-GW**	**Arsenic**	**9.5**	**0.058**	370	**164**
Anchor 2006b	**Sep-06**	**DSI07-GW**	**Arsenic**	**9.5**	**0.058**	370	**164**
Anchor 2006b	**Sep-06**	**DSI07-GW**	**Arsenic**	**7.2**	**0.058**	370	**124**
Anchor 2006b	**Sep-06**	**DSI11-GW**	**Arsenic**	**6.7**	**0.058**	370	**116**
Anchor 2006b	Sep-06	MW-5	Chromium	54	50	318	1.1
Anchor 2006b	Sep-06	DSI09-GW	Lead	55	15	13	4.2
Anchor 2006b	Sep-06	DSI12-GW	Lead	27	15	13	2.1
Anchor 2006b	**Sep-06**	**DSI12-GW**	**Benzo(a)pyrene**	**3.5**	**0.1**	**0.27**	**35**
Anchor 2006b	**Sep-06**	**DSI07-GW**	**Benzene**	**210**	**0.8**	NA	**263**
Anchor 2006b	**Sep-06**	**DSI07-GW**	**Benzene**	**180**	**0.8**	NA	**225**
Anchor 2006b	**Sep-06**	**DSI04-GW**	**Vinyl chloride**	**0.6**	**0.029**	NA	**21**
Anchor 2006b	**Sep-06**	**DSI08-GW**	**Vinyl chloride**	**0.4**	**0.029**	NA	**14**
Anchor 2006b	**Sep-06**	**DSI05-GW**	**Vinyl chloride**	**0.3**	**0.029**	NA	**10**

a - MTCA cleanup level is the lower of the MTCA Method A and B cleanup levels. Cyanide does not have a MTCA cleanup level, therfore the MCL was used.
b - Groundwater to sediment screening value, based on sediment CSLs. From: SAIC 2006

Notes:
(1) Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or GW-to-Sediment Screening Value, whichever is lower. Only samples with exceedance factors greater than 1 are shown.
(2) Chemicals with exceedance factors greater than 10 are shown in **Bold**

Table 9
Chemicals above Screening Levels in Soil
Glacier Northwest, Inc.

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)		MTCA Cleanup Level[a] (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL)[b] (mg/kg)	Exceedance Factor
Parametrix 1985	**Mar-85**	**Composite 1**	**2.5-5.0**	**Arsenic**	**51**		**0.67**	12,000	**76**
Parametrix 1985	**Mar-85**	**Composite 2**	**0-5.0**	**Arsenic**	**26**		**0.67**	12,000	**39**
Parametrix 1985	**Mar-85**	**Composite 3**	**2.5-5.0**	**Arsenic**	**46**		**0.67**	12,000	**69**
Parametrix 1985	**Mar-85**	**Composite 4**	**2.5-5.0**	**Arsenic**	**20**		**0.67**	12,000	**30**
Parametrix 1990	**May-90**	**B-2**	**0-15**	**Arsenic**	**79**		**0.67**	12,000	**118**
Parametrix 1990	**May-90**	**B-3**	**0-15**	**Arsenic**	**150**		**0.67**	12,000	**224**
Parametrix 1990	May-90	B-1	0-20	Chromium	21		19	270	1.1
Parametrix 1990	May-90	B-2	0-15	Chromium	24		19	270	1.3
Parametrix 1990	May-90	B-3	0-15	Chromium	22		19	270	1.2
Parametrix 1985	Mar-85	Composite 4	2.5-5.0	Mercury	0.2		2	0.03	6.7
Parametrix 1990	May-90	B-1	0-20	Mercury	0.26		2	0.03	8.7
Parametrix 1990	May-90	B-2	0-15	Mercury	0.22		2	0.03	7.3
Parametrix 1985	Mar-85	Composite 3	2.5-5.0	Zinc	40.3		24,000	38	1.1
Parametrix 1990	May-90	TP-2	1.5	Total Petroleum Hydrocarbons	240		200	NA	1.2
Parametrix 1990	**May-90**	**TP-3**	**1.5**	**Total Petroleum Hydrocarbons**	**10,000**		**200**	NA	**50**

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database
b - Soil to sediment screening level, based on sediment CSLs. From: SAIC 2006

DW - dry weight
CSL - Contaminant Screening Level from Washington Sediment Management Standards
NA - Not available

Notes:
(1) Table presents detected chemicals only
(2) Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Value, whichever is lower. Only samples with exceedance factors greater than or equal to 1 are shown.
(3) Chemicals with exceedance factors greater than 10 are shown in **Bold**

Table 10
Chemicals above Screening Levels in Groundwater
Glacier Northwest, Inc.

Source	Sample Date	Sample Location	Chemical	Groundwater Conc'n (ug/L)	MTCA Cleanup Level[a] (ug/L)	GW-to-Sediment Screening Level[b] (Based on CSL) (ug/L)	Exceedance Factor
Parametrix 1990	**May-90**	**B-2**	**Arsenic**	**150**	**0.058**	370	**2586**
Parametrix 1990	**May-90**	**B-3**	**Arsenic**	**330**	**0.058**	370	**5690**
Parametrix 1990	May-90	B-1	Chromium	90	50	318	1.8
Parametrix 1990	**May-90**	**B-1**	**Silver**	**270**	NA	**1.5**	**180**
Parametrix 1990	**May-90**	**B-2**	**Silver**	**430**	NA	**1.5**	**287**
Parametrix 1990	**May-90**	**B-3**	**Silver**	**340**	NA	**1.5**	**227**
Parametrix 1990	May-90	B-2	2,4-Dichlorophenol	51	24	NA	2.1
Parametrix 1990	**May-90**	**B-2**	**Pentachlorophenol**	**3000**	**0.73**	**10**	**4110**
Parametrix 1990	**Jun-90**	**B-2**	**Pentachlorophenol**	**2800**	**0.73**	**10**	**3836**

a - MTCA cleanup level is the lower of the MTCA Method A and B cleanup levels. Cyanide does not have a MTCA cleanup level, therfore the MCL was used.
b - Groundwater to sediment screening level, based on sediment CSLs. From SAIC 2006

Notes:
(1) Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or GW-to-Sediment Screening Value, whichever is lower. Only samples with exceedance factors greater than or equal to 1 are shown.
(2) Chemicals with exceedance factors greater than 10 are shown in **Bold**

Table 11
Chemicals above Screening Levels in Seep Samples
Glacier Northwest, Inc.

Source	Date Sampled	Sample Location	Chemical	Conc'n (ug/L)		Marine Chronic WQS	Marine Acute WQS	Chronic WQS Exceedance Factor	GW-to-Sediment Screening Level (Based on CSL)[a]	Exceedance Factor
Filtered Samples										
Hart Crowser 1990	May-95	SW-01	Arsenic	85		36	69	2.4	370	
Hart Crowser 1990	May-95	SW-02	Arsenic	82		36	69	2.3	370	
Windward 2004	Jul-04	Seep 61	Arsenic	72.4		36	69	2.0	370	

Exceedance factors are the ratio of the detected concentration to the screening level; exceedance factors are shown only if they are greater than or equal to 1.
Chemicals with exceedance factors greater than 10 are shown in **Bold**

WQS - Water Quality Standards
CSL - Sediment Management Standards Cleanup Screening Level

a - Groundwater to sediment screening level, based on sediment CSLs. From SAIC 2006

Table 12
Chemicals above Screening Levels in Soil
MRI Corporation

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)		MTCA Cleanup Level[a] (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL)[b] (mg/kg)	Exceedance Factor
SKCDPH 1998	Nov-97	MST-1	0-0.5	Chromium	22		19	270	1.2
SKCDPH 1998	Nov-97	MST-2	0-0.5	Chromium	33		19	270	1.7
SKCDPH 1998	Nov-97	MST-1	0-0.5	Lead	470		250	1,300	1.9

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database
b - From: SAIC 2006
DW - dry weight
CSL - Contaminant Screening Level from Washington Sediment Management Standards

Notes:
(1) Table presents detected chemicals only
(2) Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Value, whichever is lower. Only samples with exceedance factors greater than or equal to 1 are shown.
(3) Chemicals with exceedance factors greater than 10 are shown in **Bold**

Table 13
Chemicals above Screening Levels in Catch Basin Sediment Samples
The Chemithon Corporation

Source	Date Sampled	Sample Location	Chemical	Conc'n (mg/kg DW)	% TOC (DW)	Conc'n (mg/kg OC)	SQS	CSL	Units	SQS Exceedance Factor[a]	CSL Exceedance Factor[a]	MTCA Cleanup Level (mg/kg)	MTCA Exceedance Factor
ARI 2006b	10/12/2006	CB93	4-Methylphenol	1.7	4.22	NA	0.67	0.67	mg/kg DW	2.5	2.5	NA	
ARI 2006b	10/12/2006	CB95	4-Methylphenol	2.2	13.2	NA	0.67	0.67	mg/kg DW	3.3	3.3	NA	
ARI 2006a	5/5/2006	CB90	*Acenaphthene*	*0.53*	2.03	26	16	57	mg/kg OC	1.6		4,800	
ARI 2006a	**5/5/2006**	**CB90**	**Arsenic**	**40**		NA	57	93	mg/kg DW			**0.67**	**59.70**
ARI 2006b	**10/12/2006**	**CB93**	**Arsenic**	**30**		NA	57	93	mg/kg DW			**0.67**	**44.78**
ARI 2006b	**10/12/2006**	**CB94**	**Arsenic**	**60**		NA	57	93	mg/kg DW	1.1		**0.67**	**89.55**
ARI 2006b	**10/12/2006**	**CB95**	**Arsenic**	**150**		NA	57	93	mg/kg DW	2.6	1.6	**0.67**	**223.88**
ARI 2006c	**11/14/2006**	**CH-N**	**Arsenic**	**20**		NA	57	93	mg/kg DW			**0.67**	**29.85**
ARI 2007	**2/6/2007**	**CB96**	**Arsenic**	**20**		NA	57	93	mg/kg DW			**0.67**	**29.85**
ARI 2007	**2/6/2007**	**CB98**	**Arsenic**	**7**		NA	57	93	mg/kg DW			**0.67**	**10.45**
ARI 2006a	**5/5/2006**	**CB90**	***Benzo(a)anthracene***	***6.3***	2.03	310	110	270	mg/kg OC	2.8	1.1	**0.14**	**45.00**
ARI 2006b	10/12/2006	CB93	Benzo(a)anthracene	0.99	4.22	23	110	270	mg/kg OC			0.14	7.07
ARI 2006b	10/12/2006	CB94	Benzo(a)anthracene	0.52	7.18	7.2	110	270	mg/kg OC			0.14	3.71
ARI 2006b	10/12/2006	CB95	Benzo(a)anthracene	0.82	13.2	6.2	110	270	mg/kg OC			0.14	5.86
ARI 2006c	11/14/2006	CH-E	Benzo(a)anthracene	0.5	3.65	14	110	270	mg/kg OC			0.14	3.57
ARI 2006c	11/14/2006	CH-N	Benzo(a)anthracene	0.58	2.4	24	110	270	mg/kg OC			0.14	4.14
ARI 2007	2/6/2007	CB96	Benzo(a)anthracene	0.8	4.83	17	110	270	mg/kg OC			0.14	5.71
ARI 2006a	**5/5/2006**	**CB90**	***Benzo(a)pyrene***	***5.1***	2.03	251	99	210	mg/kg OC	2.5	1.2	**0.14**	**36.43**
ARI 2006b	10/12/2006	CB93	Benzo(a)pyrene	1	4.22	24	99	210	mg/kg OC			0.14	7.14
ARI 2006b	10/12/2006	CB94	Benzo(a)pyrene	1	7.18	14	99	210	mg/kg OC			0.14	7.14
ARI 2006b	10/12/2006	CB95	Benzo(a)pyrene	1.1	13.2	8.3	99	210	mg/kg OC			0.14	7.86
ARI 2006c	11/14/2006	CH-E	Benzo(a)pyrene	0.64	3.65	18	99	210	mg/kg OC			0.14	4.57
ARI 2006c	11/14/2006	CH-N	Benzo(a)pyrene	0.96	2.4	40	99	210	mg/kg OC			0.14	6.86
ARI 2007	2/6/2007	CB96	Benzo(a)pyrene	0.74	4.83	15	99	210	mg/kg OC			0.14	5.29
ARI 2007	2/6/2007	CB98	Benzo(a)pyrene	0.15	1.78	8.4	99	210	mg/kg OC			0.14	1.07
ARI 2006a	**5/5/2006**	**CB90**	**Benzo(b)fluoranthene**	**4.4**	2.03	217	NA	NA				**0.14**	**31.43**
ARI 2006b	10/12/2006	CB93	Benzo(b)fluoranthene	1.2	4.22	28	NA	NA				0.14	8.57
ARI 2006b	**10/12/2006**	**CB94**	**Benzo(b)fluoranthene**	**1.4**	7.18	19	NA	NA				**0.14**	**10.00**
ARI 2006b	**10/12/2006**	**CB95**	**Benzo(b)fluoranthene**	**1.8**	13.2	14	NA	NA				**0.14**	**12.86**
ARI 2006c	11/14/2006	CH-E	Benzo(b)fluoranthene	0.93	3.65	25	NA	NA				0.14	6.64
ARI 2006c	**11/14/2006**	**CH-N**	**Benzo(b)fluoranthene**	**1.4**	2.4	58	NA	NA				**0.14**	**10.00**
ARI 2007	2/6/2007	CB96	Benzo(b)fluoranthene	0.85	4.83	18	NA	NA				0.14	6.07
ARI 2007	2/6/2007	CB98	Benzo(b)fluoranthene	0.15	1.78	8.4	NA	NA				0.14	1.07
ARI 2006a	5/5/2006	CB90	*Benzo(g,h,i)perylene*	*2.1*	2.03	103	31	78	mg/kg OC	3.3	1.3	NA	
ARI 2006a	**5/5/2006**	**CB90**	***Benzo(k)fluoranthene***	***4.8***	2.03	236	NA	NA				**0.14**	**34**
ARI 2006b	10/12/2006	CB93	Benzo(k)fluoranthene	1.1	4.22	26	NA	NA				0.14	7.9
ARI 2006b	10/12/2006	CB94	Benzo(k)fluoranthene	1	7.18	14	NA	NA				0.14	7.1
ARI 2006b	10/12/2006	CB95	Benzo(k)fluoranthene	1.3	13.2	9.8	NA	NA				0.14	9.3
ARI 2006c	11/14/2006	CH-E	Benzo(k)fluoranthene	0.48	3.65	13	NA	NA				0.14	3.4

Table 13
Chemicals above Screening Levels in Catch Basin Sediment Samples
The Chemithon Corporation

Source	Date Sampled	Sample Location	Chemical	Conc'n (mg/kg DW)	% TOC (DW)	Conc'n (mg/kg OC)	SQS	CSL	Units	SQS Exceedance Factor[a]	CSL Exceedance Factor[a]	MTCA Cleanup Level (mg/kg)	MTCA Exceedance Factor
ARI 2006c	11/14/2006	CH-N	Benzo(k)fluoranthene	0.74	2.4	31	NA	NA				0.14	5.3
ARI 2007	2/6/2007	CB96	Benzo(k)fluoranthene	0.74	4.83	15	NA	NA				0.14	5.3
ARI 2007	2/6/2007	CB98	Benzo(k)fluoranthene	0.23	1.78	13	NA	NA				0.14	1.6
ARI 2006b	10/12/2006	CB94	Benzoic Acid	4.4	7.18	NA	0.65	0.65	mg/kg DW	6.8	6.8	320,000	
ARI 2006a	5/5/2006	CB90	Benzyl Alcohol	0.36	2.03	NA	0.057	0.073	mg/kg DW	6.3	4.9	24,000	
ARI 2006c	11/14/2006	CH-E	Benzyl Alcohol	0.5	3.65	NA	0.057	0.073	mg/kg DW	8.8	6.8	24,000	
ARI 2006c	11/14/2006	CH-N	Benzyl Alcohol	0.12	2.4	NA	0.057	0.073	mg/kg DW	2.1	1.6	24,000	
ARI 2006a	5/5/2006	CB90	*bis(2-ethylhexyl)phthalate*	*5.7*	2.03	281	47	78	mg/kg OC	6.0	3.6	71	
ARI 2006b	10/12/2006	CB93	bis(2-ethylhexyl)phthalate	5.9	4.22	140	47	78	mg/kg OC	3.0	1.8	71	
ARI 2006b	**10/12/2006**	**CB95**	***bis(2-ethylhexyl)phthalate***	***65***	**13.2**	**492**	**47**	**78**	**mg/kg OC**	**10**	6.3	71	
ARI 2006c	11/14/2006	CH-E	bis(2-ethylhexyl)phthalate	4.4	3.65	121	47	78	mg/kg OC	2.6	1.5	71	
ARI 2006c	11/14/2006	CH-N	bis(2-ethylhexyl)phthalate	4.1	2.4	171	47	78	mg/kg OC	3.6	2.2	71	
ARI 2006c	11/14/2006	RCB100	bis(2-ethylhexyl)phthalate	6.2	2.71	229	47	78	mg/kg OC	4.9	2.9	71	
ARI 2007	2/6/2007	CB96	*bis(2-ethylhexyl)phthalate*	*15*	4.83	311	47	78	mg/kg OC	6.6	4.0	71	
ARI 2007	2/6/2007	CB98	bis(2-ethylhexyl)phthalate	1.1	1.78	62	47	78	mg/kg OC	1.3		71	
ARI 2006a	**5/5/2006**	**CB90**	***Butylbenzylphthalate***	***1.8***	**2.03**	**89**	**4.9**	**64**	**mg/kg OC**	**18**	1.4	**16,000**	
ARI 2006b	10/12/2006	CB93	Butylbenzylphthalate	0.8	4.22	19	4.9	64	mg/kg OC	3.9		16,000	
ARI 2006b	10/12/2006	CB94	Butylbenzylphthalate	1.2	7.18	17	4.9	64	mg/kg OC	3.4		16,000	
ARI 2006b	10/12/2006	CB95	Butylbenzylphthalate	1.7	13.2	13	4.9	64	mg/kg OC	2.6		16,000	
ARI 2006c	**11/14/2006**	**CH-E**	**Butylbenzylphthalate**	**5.2**	**3.65**	**142**	**4.9**	**64**	**mg/kg OC**	**29**	2.2	**16,000**	
ARI 2006c	11/14/2006	CH-N	Butylbenzylphthalate	0.7	2.4	29	4.9	64	mg/kg OC	6.0		16,000	
ARI 2007	2/6/2007	CB96	Butylbenzylphthalate	0.46	4.83	9.5	4.9	64	mg/kg OC	1.9		16,000	
ARI 2007	2/6/2007	CB98	Butylbenzylphthalate	0.22	1.78	12	4.9	64	mg/kg OC	2.5		16,000	
ARI 2006a	**5/5/2006**	**CB90**	***Chrysene***	***7***	2.03	345	110	460	mg/kg OC	3.1		**0.14**	**50**
ARI 2006b	**10/12/2006**	**CB93**	**Chrysene**	**1.6**	4.22	38	110	460	mg/kg OC			**0.14**	**11**
ARI 2006b	**10/12/2006**	**CB94**	**Chrysene**	**1.4**	7.18	19	110	460	mg/kg OC			**0.14**	**10**
ARI 2006b	**10/12/2006**	**CB95**	***Chrysene***	***2.3***	13.2	17	110	460	mg/kg OC			**0.14**	**16**
ARI 2006c	11/14/2006	CH-E	Chrysene	0.78	3.65	21	110	460	mg/kg OC			0.14	5.6
ARI 2006c	11/14/2006	CH-N	Chrysene	0.86	2.4	36	110	460	mg/kg OC			0.14	6.1
ARI 2007	2/6/2007	CB96	*Chrysene*	*1.2*	4.83	25	110	460	mg/kg OC			0.14	8.6
ARI 2007	2/6/2007	CB98	Chrysene	0.24	1.78	13	110	460	mg/kg OC			0.14	1.7
ARI 2006a	5/5/2006	CB90	Copper	1,820		NA	390	390	mg/kg DW	4.7	4.7	3,000	
ARI 2006b	10/12/2006	CB93	Copper	991		NA	390	390	mg/kg DW	2.5	2.5	3,000	
ARI 2006b	10/12/2006	CB94	Copper	1,150		NA	390	390	mg/kg DW	2.9	2.9	3,000	
ARI 2006b	10/12/2006	CB95	Copper	734		NA	390	390	mg/kg DW	1.9	1.9	3,000	
ARI 2006c	11/14/2006	CH-E	Copper	1,040		NA	390	390	mg/kg DW	2.7	2.7	3,000	
ARI 2006c	11/14/2006	CH-N	Copper	696		NA	390	390	mg/kg DW	1.8	1.8	3,000	
ARI 2007	2/6/2007	CB96	Copper	557		NA	390	390	mg/kg DW	1.4	1.4	3,000	
ARI 2006a	5/5/2006	CB90	*Dibenz(a,h)anthracene*	*0.6*	2.03	30	12	33	mg/kg OC	2.5		0.14	4.3

Table 13
Chemicals above Screening Levels in Catch Basin Sediment Samples
The Chemithon Corporation

Source	Date Sampled	Sample Location	Chemical	Conc'n (mg/kg DW)	% TOC (DW)	Conc'n (mg/kg OC)	SQS	CSL	Units	SQS Exceedance Factor[a]	CSL Exceedance Factor[a]	MTCA Cleanup Level (mg/kg)	MTCA Exceedance Factor
ARI 2006b	10/12/2006	CB93	Dibenz(a,h)anthracene	0.18	4.22	4.3	12	33	mg/kg OC			0.14	1.3
ARI 2006b	10/12/2006	CB94	Diesel-Range Hydrocarbons	5,400		NA	NA	NA				2,000	2.7
ARI 2006b	10/12/2006	CB95	Diesel-Range Hydrocarbons	5,700		NA	NA	NA				2,000	2.9
ARI 2006c	11/14/2006	RCB100	Diesel-Range Hydrocarbons	3,800		NA	NA	NA				2,000	1.9
ARI 2006a	5/5/2006	CB90	*Fluoranthene*	*16*	2.03	788	160	1,200	mg/kg OC	4.9		3,200	
ARI 2006a	**5/5/2006**	**CB90**	***Indeno(1,2,3-cd)pyrene***	***2.2***	2.03	108	34	88	mg/kg OC	3.2	1.2	**0.14**	**16**
ARI 2006b	10/12/2006	CB93	Indeno(1,2,3-cd)pyrene	0.52	4.22	12	34	88	mg/kg OC			0.14	3.7
ARI 2006b	10/12/2006	CB94	Indeno(1,2,3-cd)pyrene	0.95	7.18	13	34	88	mg/kg OC			0.14	6.8
ARI 2006b	10/12/2006	CB95	Indeno(1,2,3-cd)pyrene	0.67	13.2	5.1	34	88	mg/kg OC			0.14	4.8
ARI 2006c	11/14/2006	CH-E	Indeno(1,2,3-cd)pyrene	0.22	3.65	6.0	34	88	mg/kg OC			0.14	1.6
ARI 2006c	11/14/2006	CH-N	Indeno(1,2,3-cd)pyrene	0.41	2.4	17	34	88	mg/kg OC			0.14	2.9
ARI 2007	2/6/2007	CB96	*Indeno(1,2,3-cd)pyrene*	*0.45*	4.83	9.3	34	88	mg/kg OC			0.14	3.2
ARI 2006a	5/5/2006	CB90	Lead	410		NA	450	530	mg/kg DW			250	1.6
ARI 2006b	10/12/2006	CB94	Lead	276		NA	450	530	mg/kg DW			250	1.1
ARI 2006b	10/12/2006	CB95	Lead	352		NA	450	530	mg/kg DW			250	1.4
ARI 2006b	10/12/2006	CB93	Motor Oil-Range Hydrocarbons	2,300		NA	NA	NA				2,000	1.2
ARI 2006b	10/12/2006	CB94	Motor Oil-Range Hydrocarbons	7,500		NA	NA	NA				2,000	3.8
ARI 2006b	10/12/2006	CB95	Motor Oil-Range Hydrocarbons	12,000		NA	NA	NA				2,000	6.0
ARI 2006c	11/14/2006	CH-N	Motor Oil-Range Hydrocarbons	2,100		NA	NA	NA				2,000	1.1
ARI 2006c	11/14/2006	RCB100	Motor Oil-Range Hydrocarbons	9,500		NA	NA	NA				2,000	4.8
ARI 2007	2/6/2007	CB96	Motor Oil-Range Hydrocarbons	5,300		NA	NA	NA				2,000	2.7
ARI 2006a	5/5/2006	CB90	*Phenanthrene*	*7*	2.03	345	100	480	mg/kg OC	3.4		NA	
ARI 2006b	10/12/2006	CB93	Phenol	0.87	4.22	NA	0.42	1.2	mg/kg DW	2.1		48,000	
ARI 2006b	10/12/2006	CB94	Phenol	1.5	7.18	NA	0.42	1.2	mg/kg DW	3.6	1.3	48,000	
ARI 2006b	10/12/2006	CB95	Phenol	1.5	13.2	NA	0.42	1.2	mg/kg DW	3.6	1.3	48,000	
ARI 2006a	5/5/2006	CB90	Zinc	2,550		NA	410	960	mg/kg DW	6.2	2.7	24,000	
ARI 2006b	10/12/2006	CB93	Zinc	1,830		NA	410	960	mg/kg DW	4.5	1.9	24,000	
ARI 2006b	10/12/2006	CB94	Zinc	3,290		NA	410	960	mg/kg DW	8.0	3.4	24,000	
ARI 2006b	10/12/2006	CB95	Zinc	3,030		NA	410	960	mg/kg DW	7.4	3.2	24,000	
ARI 2006c	11/14/2006	CH-E	Zinc	1,380		NA	410	960	mg/kg DW	3.4	1.4	24,000	
ARI 2006c	11/14/2006	CH-N	Zinc	888		NA	410	960	mg/kg DW	2.2		24,000	
ARI 2007	2/6/2007	CB96	Zinc	939		NA	410	960	mg/kg DW	2.3		24,000	

OC - Organic carbon normalized
DW - Dry weight

a - Exceedance factors are the ratio of the detected concentration to the SQS or CSL or MTCA Cleanup Level; exceedance factors are shown only if they are greater than or equal to 1.
Chemicals with exceedance factors greater than 10 are shown in **Bold**
Concentrations shown in italics are results obtained through laboratory dilution of the sample.

Table 14
Chemicals in Catch Basin Solid Sample
The Chemithon Corporation

Source	Sample Date	Sample Location	Chemical	Soil Conc'n (mg/kg DW)	MTCA Cleanup Level[a] (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL)[b] (mg/kg DW)	Exceedance Factor
ARI 2007	**2/6/2007**	**CB97**	**2,4-Dimethylphenol**	**6.3**	1,600	**0.002**	**3,150**
ARI 2007	**2/6/2007**	**CB97**	***2-Methylnaphthalene***	***23***	NA	**0.073**	**315**
ARI 2007	**2/6/2007**	**CB97**	**2-Methylphenol**	**0.51**	NA	**0.0052**	**98**
ARI 2007	**2/6/2007**	**CB97**	**4-Methylphenol**	**0.82**	NA	**0.056**	**15**
ARI 2007	2/6/2007	CB97	Acenaphthene	0.27	4,800	0.060	4.5
ARI 2007	**2/6/2007**	**CB97**	**Aroclor 1254**	**3.8**	NA	**0.065**	**58**
ARI 2007	**2/6/2007**	**CB97**	**Aroclor 1260**	**3.2**	NA	**0.065**	**49**
ARI 2007	**2/6/2007**	**CB97**	**Arsenic**	**13**	**0.67**	587	**19**
ARI 2007	2/6/2007	CB97	Benzo(a)anthracene	0.6	0.14	0.27	4.3
ARI 2007	2/6/2007	CB97	Benzo(a)pyrene	0.31	0.14	0.21	2.2
ARI 2007	2/6/2007	CB97	Benzo(b)fluoranthene	0.82	0.14	0.45	5.9
ARI 2007	2/6/2007	CB97	Benzo(g,h,i)perylene	0.21	NA	0.078	2.7
ARI 2007	2/6/2007	CB97	Benzo(k)fluoranthene	0.59	0.14	0.45	4.2
ARI 2007	**2/6/2007**	**CB97**	**bis(2-ethylhexyl)phthalate**	**0.94**	71	**0.078**	**12**
ARI 2007	**2/6/2007**	**CB97**	***Butylbenzylphthalate***	***97***	16,000	**0.066**	**1,470**
ARI 2007	2/6/2007	CB97	Chrysene	1	0.14	0.46	2.2
ARI 2007	2/6/2007	CB97	Copper	139	3,000	39	3.6
ARI 2007	2/6/2007	CB97	*Di-n-butylphthalate*	*2.4*	8,000	2.0	1.2
ARI 2007	2/6/2007	CB97	Fluoranthene	1.8	3,200	1.2	1.5
ARI 2007	2/6/2007	CB97	Fluorene	0.29	3,200	0.081	3.6
ARI 2007	2/6/2007	CB97	Indeno(1,2,3-cd)pyrene	0.19	0.14	0.088	2.2
ARI 2007	**2/6/2007**	**CB97**	**Lead**	**1760**	250	**67**	**26**
ARI 2007	**2/6/2007**	**CB97**	**Mercury**	**9.4**	2	**0.030**	**313**
ARI 2007	2/6/2007	CB97	Naphthalene	0.84	5	0.2	4.2
ARI 2007	2/6/2007	CB97	Phenanthrene	1	NA	0.49	2.0
ARI 2007	2/6/2007	CB97	Phenol	0.24	48,000	0.12	2.0
ARI 2007	2/6/2007	CB97	Pyrene	1.4	2,400	1.4	1.0
ARI 2007	**2/6/2007**	**CB97**	**Zinc**	**771**	24,000	**38**	**20**

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database
b - From: SAIC 2006
DW - dry weight
CSL - Contaminant Screening Level from Washington Sediment Management Standards

Notes:
(1) Table presents detected chemicals only
(2) Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Value, whichever is lower. Only samples with exceedance factors greater than or equal to 1 are shown.
(3) Chemicals with exceedance factors greater than 10 are shown in **Bold**
(4) Concentrations shown in italics are results obtained through laboratory dilution of the sample.

Table 15
Chemicals above Screening Criteria in Water Sample
The Chemithon Corporation

Source	Date Sampled	Sample Location	Chemical	Conc'n (ug/L)		Marine Chronic WQS	Marine Acute WQS	Chronic WQS Exceedance Factor	GW-to-Sediment Screening Level (Based on CSL)[a]	Exceedance Factor
ARI 2007	2/6/2007	CB99	Bis(2-ethylhexyl)phthalate	1.9		NA	NA		0.47	4.0
ARI 2007	**2/6/2007**	**CB99**	**Copper**	**46**		**3.1**	**4.8**	**15**	**123**	
ARI 2007	**2/6/2007**	**CB99**	**Diesel-Range Hydrocarbons**	**13,000**		**NA**	**NA**		**NA**	
ARI 2007	2/6/2007	CB99	Zinc	155		81	90	1.9	76	2.0

NA - Value not available

Exceedance factors are the ratio of the detected concentration to the CSL or SQS; exceedance factors are shown only if they are greater than or equal to 1.
Chemicals with exceedance factors greater than 10 are shown in **Bold**

a - From SAIC 2006

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Appendix A
Sediment Sample Data

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Appendix B
Alaska Marine Lines Historical Data

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Appendix C
Duwamish Shipyard Historical Data

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Appendix D
Glacier Northwest Historical Data

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Appendix E
MRI Corporation Historical Data

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Appendix F
Aerial Photos

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