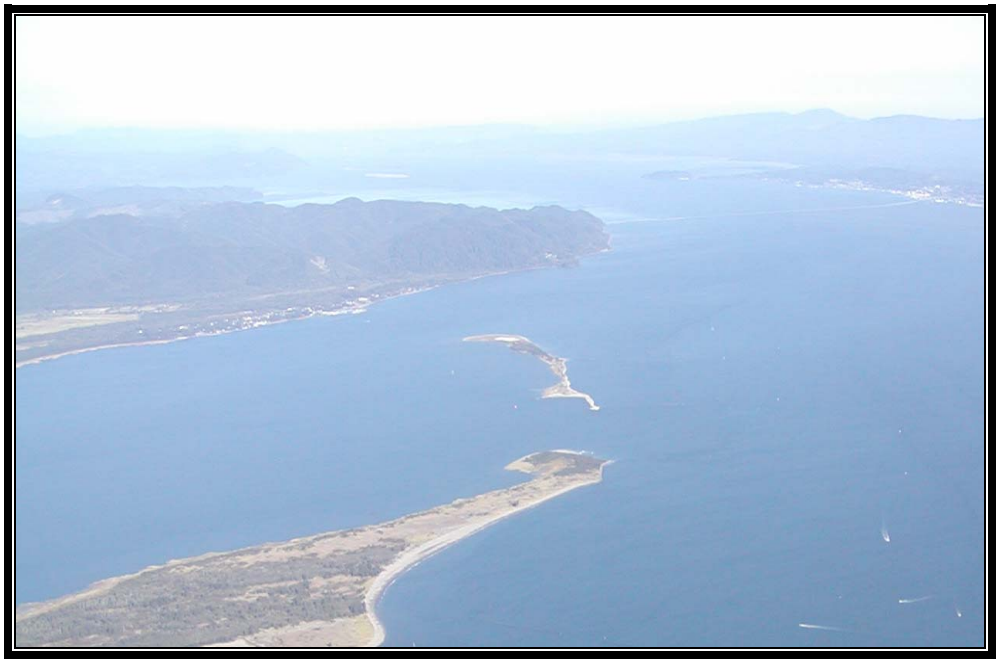
CHINOOK ENTRANCE CHANNEL SEDIMENT QUALITY EVALUATION REPORT



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CENWP-EC-HR

ACRONYMS

Ag	Silver
As	Arsenic
Cd	Cadmium
CoC	Contaminate of concern
Cr	Chromium
CRM	Columbia River Mile
Cu	Copper
DMEF	Dredge Material Evaluation Framework
EPA	Environmental Protection Agency
Hg	Mercury
J	Laboratory estimated value detected between MRL & MDL
MDL	Method Detection Limit
MLLW	Mean Lower Low Water
MRL	Method Reporting Limit
ND	Non-detected at MRL or MDL
NES	Newly Exposed Surface
Ni	Nickel
PAH	Polynuclear Aromatic Hydrocarbon
Pb	Lead
PCB	Polychlorinated Biphenyl
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RMT	Regional Management Team
Sb	Thallium
SL	Screening Level
Tier II	Physical (a) & Chemical (b) analyses
Tier III	Bioassay & Bioaccumulation analyses
TOC	Total Organic Carbon
TVS	Total Volatile Solids
U	Laboratory non-detect at MRL
USFWS	U. S. Fish & Wildlife Service
WDNR	Washington Department of Natural Resources
Zn	Zinc
∑	Total value (i.e. DDT + DDE + DDD)

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ABSTRACT

Baker Bay is on the North side, at the Mouth of the Columbia River and is traversed on the west by the West Channel, a federally maintained navigation project, extending from the Columbia River project at River Mile (RM) 2.5, upstream to the entrance of Ilwaco Boat Basin. Ilwaco (East) Channel, which is not maintained, runs generally east from Ilwaco and intersects Chinook Entrance Channel east of East Sand Island. The existing project at Chinook provides for a channel 10-feet deep and 15-feet wide from deep water in the Columbia River to a turning and mooring basin 10-feet deep, 590-feet long and 500-feet wide at Chinook. The turning and mooring basins are maintained by local interests.

This evaluation was conducted following procedures set forth in the Ocean Testing Manual and Inland Testing Manual, developed jointly by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency to assess dredged material. Guidelines used are those developed to implement the Clean Water Act and Marine Protection, Research and Sanctuaries Act. These national guidelines and associated local screening levels are those adopted for use in the regional Dredge Material Evaluation Framework for the Lower Columbia River Management Area (DMEF), November 1998.

A total of six (6) box-core surface grab sediment samples were collected along the length of the Chinook Entrance Channel June 29, 2004. All samples were submitted for physical analyses including total volatile solids; 2 samples were analyzed for metals (9 inorganic), total organic carbon, pesticides and polychlorinated biphenyls, phenols, phthalates, miscellaneous extractables, polynuclear aromatic hydrocarbon, with 1 sample analyzed for both porewater and total sediment organotin.

Two (2) samples were classified as “fat clay", and 4 samples as “poorly graded sand.” Mean grain size for all the samples was 0.13mm (range 0.0082mm to 0.2076mm), with 0.0% gravel, 65.2% sand (range 1.0% to 97.6%), and 34.8% fines (range 2.4% to 99.0%). Volatile solids for all samples ranged from 0.4% to 11.2% with a mean value of 3.7%.

The chemical data collected indicates low levels of 8 metals present in 1 sample analyzed and 7 metals present in the other, but levels do not approach their respective DMEF screening levels (SL). All total DDT, PCB, PAH and Organotin detection/ reporting levels were low, with non-detect (ND) results reported. The laboratory failed to reach sufficiently low detection levels for some semi-volatile compounds (see lab data sheet, Appendix A). Material from Chinook Entrance Channel and the Mouth of the Columbia River have not historically had a problem with the presence of significant levels of these semi-volatile compounds; with no point sources present, the few elevated detection/reporting levels are not viewed as a problem in determining the material represented to be suitable for open in-water placement without further characterization.

INTRODUCTION

This report characterizes the sediment to be dredged at the Chinook Entrance Channel for the purposes of dredging and disposal. The sampling and analysis objectives are stated in the Sampling and Analysis Plan (SAP June 2004), and are also listed below. This report will outline the procedures used to accomplish these objectives.

Sampling and Analysis Objectives

- To characterize sediments in accordance with the DMEF manual.
- Collect, handle and analyze representative sediment samples, of the proposed dredging prism, in accordance with protocols and Quality Assurance/Quality Control (QA/QC) requirements.

- Characterize sediments to be dredged for evaluation of environmental impact upon disposal.

- Conduct physical and chemical characterization of dredge prism.

PREVIOUS STUDIES

Chinook Entrance Channel sediment quality investigations have been carried out at various yearly intervals since 1973, with the last investigation at Chinook Entrance Channel being done in 1997. In 1987 testing for physical properties, bulk chemistry (including elutriate tests) and bioassays were conducted. Sediments were found to be acceptable for in-water disposal at a dispersive site to avoid any adverse effect that might be derived from ammonia concentrations that were detected during elutriate testing. The results of the physical and bulk chemical testing done in 1992 and 1997 showed the materials to be clean sands in the outer entrance and fine-grained inner entrance channel, all of which was suitable for unconfined in-water disposal.

CURRENT SAMPLING EVENT/DISCUSSION

A total of six (6) samples were collected from the Chinook Entrance Channel at Baker Bay, June 29, 2004 (see Figure 2 and Table 1). The samples were collected using a Box-core sampling device (BC). All samples were submitted for physical analyses including total volatile solids; 2 samples were analyzed for metals (9 inorganic), total organic carbon, pesticides and polychlorinated biphenyls, phenols, phthalates, miscellaneous extractables, polynuclear aromatic hydrocarbon, with 1 sample analyzed for both porewater and total sediment organotin.

Table 1. Sample Location Coordinates (NAD 83, Oregon State Plane North)

0604CC-BC-01	46˚ 15' 46.9" 123˚ 57' 41.0"	0604CC-BC -02	46˚ 15' 53.7" 123˚ 57' 30.1"
0604CC-BC -03	46˚ 16' 02.5" 123˚ 57' 17.7"	0604CC-BC -04	46˚ 16' 16.6" 123˚ 57' 13.3"
0604CC-BC -05	46˚ 16' 18.4" 123˚ 57' 07.1"	0604CC-BC -06	46˚ 16' 15.7" 123˚ 57' 00.7"

RESULTS

Physical and Volatile Solids (ASTM methods)

Six (6) samples were submitted for physical analyses, with data presented in Table 2. Two (2) samples were classified as "fat clay", and 4 samples as "poorly graded sand." Mean grain-size for all the samples was 0.13mm (range 0.0082mm to 0.2076mm), with 0.0% gravel, 65.2% sand (range 1.0% to 97.6%), and 34.8% fines (range 2.4% to 99.0%). Volatile solids for all samples ranged from 0.4% to 11.2% with a mean value of 3.7%.

Metals (EPA method 6010/7471), Total Organic Carbon (EPA method 415.1)

Two (2) samples were submitted for metals and TOC testing, with data presented in Table 3. The TOC analyses indicated 29,000 and 32,000 mg/kg (ppm) in the respective samples. Low levels of some metals were found, but did not approach the DMEF screening level (SL). The levels detected are consistent with historical levels of metals detected in the Chinook Entrance Channel.

Pesticides/PCBs (EPA method 8080), Phenols, Phthalates and Miscellaneous Extractables (EPA method 8270)

Two (2) samples were submitted for pesticides/PCBs, phenols, phthalates and miscellaneous extractables. All pesticide,[1] PCB[2] and Organotin[3] detection/ reporting levels were low, with non-detect (ND) results reported. All semi-volatile[4] (Phenols, Phthalates & Misc. Extractables) results were ND, as well, but had somewhat elevated detection/reporting levels, with most at or below DMEF screening levels.

[1] Total DDT was non-detect (ND) at <1.2 ug/kg for all samples. DMEF screening level (SL) for Total DDT is 6.9 ug/kg. Ch

[2] Total PCB Aroclor were ND at <23 ug/kg for all samples. DMEF – SL for total PCB Aroclors is 130 ug/kg.

[3] Total Organotin (TBT) was <0.05 ug/L (pore water) & < 2.1ug/kg total (bulk) in sediment. DMEF pore water SL is 0.15ug/L; 73ug/kg is the total sediment SL.

[4] All semi-volatile (method 8270C) compounds were ND at the levels reported (MDL & MRL). All PAHs and phthalates were reported at levels less than the DMEF-SL. Phenols and misc. extractables were, also, ND, but had some elevated detection limits

Polynuclear Aromatic Hydrocarbons (EPA method 8270C) [5]

Two (2) samples were submitted for PAHs. No "low molecular weight" or "High molecular weight" PAHs were detected in any samples. All semi-volatile (PAHs) results were non-detect, but had somewhat elevated detection/reporting levels, with most at or below DMEF screening levels.

CONCLUSION

This evaluation was conducted following procedures set forth in the Inland Testing Manual, developed jointly by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency to assess dredged material and the Dredge Material Evaluation Framework for the Lower Columbia River Management Area (DMEF). The DMEF is a regional manual developed jointly with regional EPA, Corps, Oregon Department of Environmental Quality and Washington Departments of Ecology and Natural Resources. This document is a guideline for implementing the Clean Water Act (40 CFR 230), Section 404 (b)(1). The screening levels used are those adopted for use in the DMEF, final November 1998. The DMEF tiered testing approach requires that material in excess of 20% fines and greater than 5% volatile solids, as well as any material with prior history or is suspected ("reason to believe") of being contaminated, be subjected to physical (Tier IIa) as well as chemical (Tier IIb) analyses.

Of the 6 samples collected form the Chinook Entrance Channel at Baker Bay only 2 were submitted for chemical analyses, 0604CC-BC-05 thru 06. Samples 01 thru 04 contained an average of 97.3% sand, were not near any source of contamination and were, therefore, not submitted for chemical analyses. The chemical data collected indicates low levels of 8 metals present in 1 sample analyzed and 7 metals present in the other, but levels do not approach their respective DMEF screening levels (SL). All total DDT, PCB, PAH and Organotin detection/ reporting levels were low, with non-detect (ND) results reported. The laboratory failed to reach sufficiently low detection levels for some semi-volatile compounds (see lab data sheet, Appendix A). Material from Chinook Entrance Channel and the Mouth of the Columbia River have not historically had a problem with the presence of significant levels of these semi-volatile compounds; with no point sources present, the few elevated detection/reporting levels are not viewed as a problem in determining the material represented to be suitable for open in-water placement without further characterization.

[5] All PAHs (method 8270C) were ND at less than their respective DMEF screening level.

REFERENCES

1. U.S. Army Corps of Engineers, Portland District and Seattle District; U.S. Environmental Protection Agency, Region 10; Oregon Department of Environmental Quality; Washington State Department of Natural Resources and Department of Ecology. 1998 Final. Dredge Material Evaluation Framework for the Lower Columbia River Management Area.

2. U.S. Environmental Protection Agency and U.S. Army Corps of Engineers. February 1998. Evaluation of Dredged Material Proposed for Discharge in Inland and Near Coastal Waters - Testing Manual (referred to as the "Inland Testing Manual").

3. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency. February 1991. Evaluation of Dredged Material Proposed for Ocean Disposal - Testing Manual (referred to as the OTM or the "Green Book"). U.S. Army Corps of Engineers. January 2003. Evaluation of Dredged Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities - Testing Manual (referred to as the "Upland Testing Manual").

4. Clean Water Act, 40 CFR 230 (b)(1).

5. PSDDA. 1996. Puget Sound Dredged Disposal Analysis, Technical Information Memorandum, Testing, Reporting and Evaluation of Tributyltin Data in PSDDA and SMS Programs.

6. U.S. Army Corps of Engineers. June 2004. Sediment Sampling and Analysis Plan, Chinook Entrance Channel. Portland District.

7. U.S. Army Corps of Engineers. June 1997. Sediment Sampling and Analysis Plan, Chinook Entrance Channel, Baker Bay. Portland District.

8. U.S. Army Corps of Engineers. June 1997. Chinook Entrance Channel, Baker Bay Sediment Evaluation Report. Portland District.

9. U.S. Army Corps of Engineers. August 1992. Chinook Entrance Channel, Baker Bay Sediment Evaluation Report. Portland District.

10. U.S. Army Corps of Engineers. December 1986. Chinook Entrance Channel, Baker Bay Sediment Evaluation Report. Portland District.

11. U.S. Army Corps of Engineers. July - August 1980. Chinook Entrance Channel, Baker Bay Sediment Evaluation Report. Portland District.

Table 2: Physical Analysis and Volatile Solids
Sampled June 29, 2004

Sample I.D.	Grain Size (mm)	Percent			
	Mean	Gravel	Sand	Silt/Clay	Volatile Solids
0604CC-BC-01	0.1848	0.0	97.5	2.5	0.6
0604CC-BC-02	0.1877	0.0	96.5	3.5	0.6
0604CC-BC-03	0.1912	0.0	97.6	2.4	0.4
0604CC-BC-04	0.2076	0.0	97.4	2.6	0.5
0604CC-BC-05	0.0113	0.0	1.0	99.0	11.2
0604CC-BC-06	0.0082	0.0	1.1	98.9	9.0
Mean	0.13	0.0	65.2	34.8	3.7
Minimum	0.0082	0.0	1.0	2.4	0.4
Maximum	0.2076	0.0	97.6	99.0	11.2

Table 3: Inorganic Metals and TOC

Sample I.D.	As	Cd	Sb	Cu	Pb	Ni	Ag	Zn	Hg	TOC
	mg/kg (ppm)									
0604CC-BC-05	8.69	<0.089	0.851	46.9	17.1	20.4	0.366	115	0.13	29000
0604CC-BC-06	9.77	<0.105	1.07	49.2	17.6	20.3	0.428	119	0.12	32000
Screening level (SL)	57	5.1	150	390	450	140	6.1	410	0.41	
Symbol (<) = Non-detect (ND) at the value listed (Method Detection Limit). Samples 0604CC-BC-01 thru 04 were not submitted for chemical analyses, they averaged 97.3% sand.										

Figure 1. Chinook Entrance Channel Vicinity Map

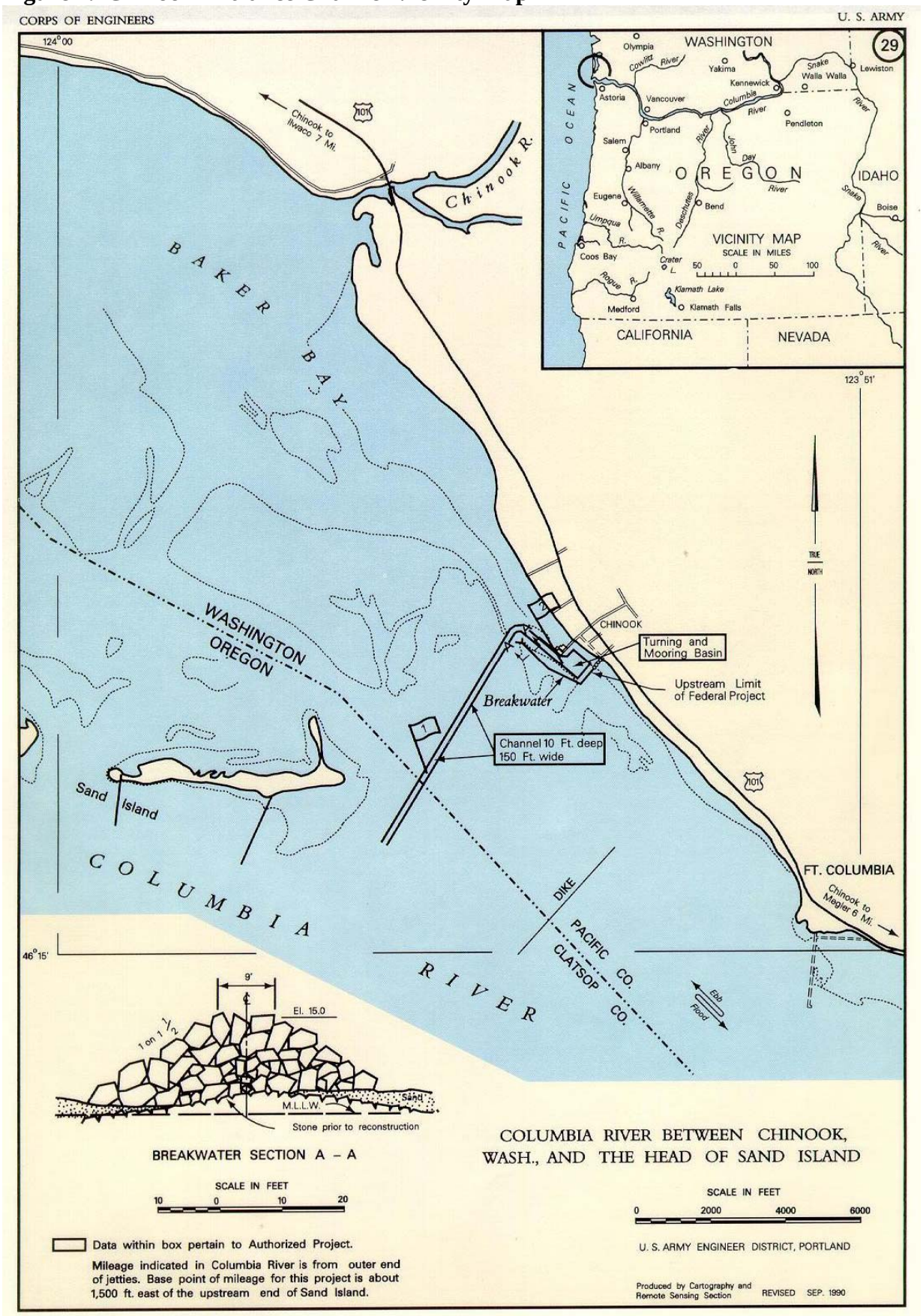
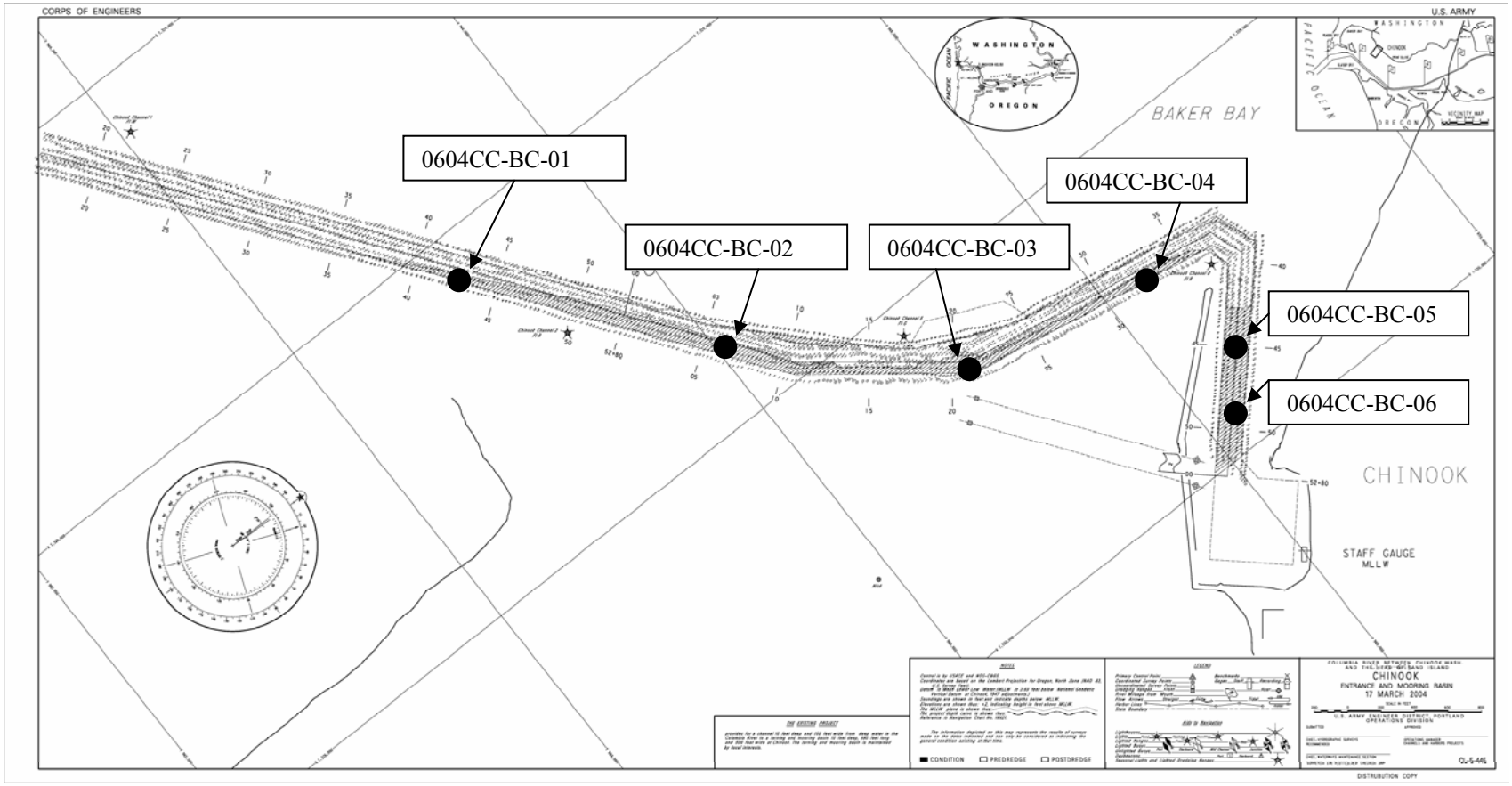


Figure 2. Chinook Entrance Channel, Sediment Sampling Station Locations



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CHINOOK ENTRANCE CHANNEL
LABORATORY DATA SHEETS
Sampled June 29, 2004

Appendix A

DMEF (1998) SL	ID	CHEMICAL_NAME	MDL	UNIT	BASIS	CODE	ANALYSIS
	CC-BC-05	Total Organic Carbon	29,000	PPM	TOC	#	#
	CC-BC-05	Pesticides & PCBs				#	SW8080
	CC-BC-05	alpha-BHC	<0.4	PPB	DRY	U	SW8080
10	CC-BC-05	gamma-BHC (Lindane)	<0.5	PPB	DRY	U	SW8080
	CC-BC-05	beta-BHC	<0.6	PPB	DRY	U	SW8080
10	CC-BC-05	Aldrin	<0.4	PPB	DRY	U	SW8080
10	CC-BC-05	Heptachlor	<0.3	PPB	DRY	U	SW8080
	CC-BC-05	delta-BHC	<0.9	PPB	DRY	U	SW8080
	CC-BC-05	Heptachlor Epoxide	<0.6	PPB	DRY	U	SW8080
	CC-BC-05	Endosulfan I	<0.5	PPB	DRY	U	SW8080
∑6.9	CC-BC-05	4,4'-DDE	<0.5	PPB	DRY	U	SW8080
10	CC-BC-05	Dieldrin	<0.5	PPB	DRY	U	SW8080
	CC-BC-05	Endrin	<0.3	PPB	DRY	U	SW8080
∑6.9	CC-BC-05	4,4'-DDD	<1.0	PPB	DRY	U	SW8080
	CC-BC-05	Endosulfan II	<0.6	PPB	DRY	U	SW8080
	CC-BC-05	Endrin Aldehyde	<0.8	PPB	DRY	U	SW8080
∑6.9	CC-BC-05	4,4'-DDT	<1.1	PPB	DRY	U	SW8080
	CC-BC-05	Endosulfan Sulfate	<0.9	PPB	DRY	U	SW8080
	CC-BC-05	Methoxychlor	<1.1	PPB	DRY	U	SW8080
	CC-BC-05	Endrin Ketone	<0.5	PPB	DRY	U	SW8080
10	CC-BC-05	Chlordane	<23	PPB	DRY	U	SW8080
	CC-BC-05	Toxaphene	<20	PPB	DRY	U	SW8080
∑130	CC-BC-05	PCB-1016	<8	PPB	DRY	U	SW8080
∑130	CC-BC-05	PCB-1221	<6	PPB	DRY	U	SW8080
∑130	CC-BC-05	PCB-1232	<24	PPB	DRY	U	SW8080
∑130	CC-BC-05	PCB-1242	<4	PPB	DRY	U	SW8080
∑130	CC-BC-05	PCB-1248	<11	PPB	DRY	U	SW8080
∑130	CC-BC-05	PCB-1254	<3	PPB	DRY	U	SW8080
∑130	CC-BC-05	PCB-1260	<9	PPB	DRY	U	SW8080
	CC-BC-05	TCMX (SURROGATE)	30	PCT		#	SW8080
	CC-BC-05	DCB (SURROGATE)	29	PCT		#	SW8080
	CC-BC-05	B/NA Extractables Soil				#	SW8270C
	CC-BC-05	bis(2-Chloroethyl)ether	<200	PPB	DRY	U	SW8270C
420	CC-BC-05	Phenol	<210	PPB	DRY	U	SW8270C
	CC-BC-05	2-Chlorophenol	<180	PPB	DRY	U	SW8270C
170	CC-BC-05	1,3-Dichlorobenzene	<180	PPB	DRY	U	SW8270C
110	CC-BC-05	1,4-Dichlorobenzene	<180	PPB	DRY	U	SW8270C
35	CC-BC-05	1,2-Dichlorobenzene	<200	PPB	DRY	U	SW8270C
	CC-BC-05	2,2'-oxybis(1-Chloropropane	<210	PPB	DRY	U	SW8270C
63	CC-BC-05	2-Methyl Phenol	<270	PPB	DRY	U	SW8270C
1400	CC-BC-05	Hexachloroethane	<210	PPB	DRY	U	SW8270C
28	CC-BC-05	N-Nitroso-di-n-propylamine	<220	PPB	DRY	U	SW8270C

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Appendix A

SL	ID	CHEMICAL_NAME		UNIT	BASIS	CODE	ANALYSIS
670	CC-BC-05	3&4-Methyl Phenol	<780	PPB	DRY	U	SW8270C
	CC-BC-05	Nitrobenzene	<220	PPB	DRY	U	SW8270C
	CC-BC-05	Isophorone	<190	PPB	DRY	U	SW8270C
	CC-BC-05	2-Nitrophe<nol	<160	PPB	DRY	U	SW8270C
29	CC-BC-05	2,4-Dimethylphenol	<220	PPB	DRY	U	SW8270C
	CC-BC-05	bis (2-Chloroethoxy)	<200	PPB	DRY	U	SW8270C
	CC-BC-05	2,4-Dichlorophenol	<170	PPB	DRY	U	SW8270C
31	CC-BC-05	1,2,4-Trichlorobenzene	<190	PPB	DRY	U	SW8270C
2100	CC-BC-05	Naphthalene	<190	PPB	DRY	U	SW8270C
29	CC-BC-05	Hexachlorobutadiene	<190	PPB	DRY	U	SW8270C
	CC-BC-05	4-Chloro-3-methylphenol	<180	PPB	DRY	U	SW8270C
670	CC-BC-05	2-Methyl Naphthalene	<170	PPB	DRY	U	SW8270C
	CC-BC-05	Hexachlorocyclopentadiene	<89	PPB	DRY	U	SW8270C
	CC-BC-05	2,4,6-Trichlorophenol	<170	PPB	DRY	U	SW8270C
	CC-BC-05	2,4,5-Trichlorophenol	<210	PPB	DRY	U	SW8270C
	CC-BC-05	2-Chloronaphthalene	<190	PPB	DRY	U	SW8270C
560	CC-BC-05	Acenaphthylene	<190	PPB	DRY	U	SW8270C
1400	CC-BC-05	Dimethyl Phthalate	<150	PPB	DRY	U	SW8270C
500	CC-BC-05	Acenapthene	<140	PPB	DRY	U	SW8270C
	CC-BC-05	2,4-Dinitrophenol	<70	PPB	DRY	U	SW8270C
	CC-BC-05	2,4-Dinitrotoluene	<140	PPB	DRY	U	SW8270C
	CC-BC-05	4-Nitrophenol	<190	PPB	DRY	U	SW8270C
540	CC-BC-05	Fluorene	<140	PPB	DRY	U	SW8270C
	CC-BC-05	4-Chlorophenyl Phenyl Ether	<180	PPB	DRY	U	SW8270C
1200	CC-BC-05	Diethyl Phthalate	<130	PPB	DRY	U	SW8270C
	CC-BC-05	2-Methyl-4,6-dinitrophenol	<100	PPB	DRY	U	SW8270C
28	CC-BC-05	N-Nitrosodiphenylamine	<90	PPB	DRY	U	SW8270C
	CC-BC-05	4-Bromophenyl Phenyl Ether	<140	PPB	DRY	U	SW8270C
22	CC-BC-05	Hexachlorobenzene	<120	PPB	DRY	U	SW8270C
400	CC-BC-05	Pentachlorophenol	<100	PPB	DRY	U	SW8270C
1500	CC-BC-05	Phenanthrene	<110	PPB	DRY	U	SW8270C
960	CC-BC-05	Anthracene	<140	PPB	DRY	U	SW8270C
5100	CC-BC-05	Di-n-butylphthalate	<130	PPB	DRY	U	SW8270C
1700	CC-BC-05	Fluoranthene	<110	PPB	DRY	U	SW8270C
	CC-BC-05	Benzidine	<1600	PPB	DRY	U	SW8270C
2600	CC-BC-05	Pyrene	<120	PPB	DRY	U	SW8270C
970	CC-BC-05	Butyl Benzyl Phthalate	<120	PPB	DRY	U	SW8270C
	CC-BC-05	3,3'-Dichlorbenzidine	<850	PPB	DRY	U	SW8270C
1300	CC-BC-05	Benzo(a)anthracene	<120	PPB	DRY	U	SW8270C
1400	CC-BC-05	Chrysene	<140	PPB	DRY	U	SW8270C
8300	CC-BC-05	bis(2-Ethylhexyl)phthalate	<100	PPB	DRY	U	SW8270C
6200	CC-BC-05	Di-n-octyl phthalate	<100	PPB	DRY	U	SW8270C
600	CC-BC-05	Indeno (1,2,3-cd)Pyrene	<89	PPB	DRY	U	SW8270C
3200	CC-BC-05	Benzo(b,k)fluoranthene	<170	PPB	DRY	U	SW8270C
1600	CC-BC-05	Benzo(a)pyrene	<140	PPB	DRY	U	SW8270C

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Appendix A

SL	ID	CHEMICAL_NAME		UNIT	BASIS	CODE	ANALYSIS
230	CC-BC-05	Dibenzo(a,h)Anthracene	<140	PPB	DRY	U	SW8270C
670	CC-BC-05	Benzo (g,h,i) perylene	<86	PPB	DRY	U	SW8270C
	CC-BC-05	2-FLUOROPHENOL (SURR)	62	PCT		#	SW8270C
	CC-BC-05	PHENOL-D5 (SURR)	66	PCT		#	SW8270C
	CC-BC-05	NITROBENZENE-D5 (SURR)	56	PCT		#	SW8270C
	CC-BC-05	2-FLUOROBIPHENYL (SURR)	31	PCT		#	SW8270C
	CC-BC-05	2,4,6-TRIBROMOPHENOL (SURR)	56	PCT		#	SW8270C
	CC-BC-05	TERPHENYL-D14 (SURR)	40	PCT		#	SW8270C
	CC-BC-05	Metals Anlaysis ICP-AES				#	6010B
390	CC-BC-05	Copper	46.9	PPM	DRY	#	6010B
140	CC-BC-05	Nickel	20.4	PPM	DRY	#	6010B
410	CC-BC-05	Zinc	115	PPM	DRY	#	6010B
150	CC-BC-05	Antimony	0.851	PPM	DRY	UJ	6010B
57	CC-BC-05	Arsenic	8.69	PPM	DRY	#	6010B
450	CC-BC-05	Lead	17.1	PPM	DRY	#	6010B
5.1	CC-BC-05	Cadmium	<0.089	PPM	DRY	U	6010B
6.1	CC-BC-05	Silver	<0.368	PPM	DRY	U	6010B
	CC-BC-05	Mercury CVAAS				#	EPA7471A
0.41	CC-BC-05	Mercury	0.13	PPM	DRY	#	EPA7471A
	CC-BC-05	Percent Solids	37	PCT		#	#
	CC-BC-05	Percent Moisture	63	PCT		#	#
	CC-BC-06	Total Organic Carbon	32,000	PPM	TOC	#	#
	CC-BC-06	Pesticides & PCBs				#	SW8080
	CC-BC-06	alpha-BHC	<0.4	PPB	DRY	U	SW8080
10	CC-BC-06	gamma-BHC (Lindane)	<0.5	PPB	DRY	U	SW8080
	CC-BC-06	beta-BHC	<0.6	PPB	DRY	U	SW8080
10	CC-BC-06	Aldrin	<0.4	PPB	DRY	U	SW8080
10	CC-BC-06	Heptachlor	<0.4	PPB	DRY	U	SW8080
	CC-BC-06	delta-BHC	<0.9	PPB	DRY	U	SW8080
	CC-BC-06	Heptachlor Epoxide	<0.7	PPB	DRY	U	SW8080
	CC-BC-06	Endosulfan I	<0.5	PPB	DRY	U	SW8080
∑6.9	CC-BC-06	4,4'-DDE	<0.5	PPB	DRY	U	SW8080
10	CC-BC-06	Dieldrin	<0.6	PPB	DRY	U	SW8080
	CC-BC-06	Endrin	<0.3	PPB	DRY	U	SW8080
∑6.9	CC-BC-06	4,4'-DDD	<1.1	PPB	DRY	U	SW8080
	CC-BC-06	Endosulfan II	<0.6	PPB	DRY	U	SW8080
	CC-BC-06	Endrin Aldehyde	<0.8	PPB	DRY	U	SW8080
∑6.9	CC-BC-06	4,4'-DDT	<1.1	PPB	DRY	U	SW8080
	CC-BC-06	Endosulfan Sulfate	<1.0	PPB	DRY	U	SW8080
	CC-BC-06	Methoxychlor	<1.1	PPB	DRY	U	SW8080
	CC-BC-06	Endrin Ketone	<0.5	PPB	DRY	U	SW8080
10	CC-BC-06	Chlordane	<24	PPB	DRY	U	SW8080
	CC-BC-06	Toxaphene	<21	PPB	DRY	U	SW8080

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∑130	CC-BC-06	PCB-1016	<9	PPB	DRY	U	SW8080
∑130	CC-BC-06	PCB-1221	<6	PPB	DRY	U	SW8080
∑130	CC-BC-06	PCB-1232	<25	PPB	DRY	U	SW8080
∑130	CC-BC-06	PCB-1242	<4	PPB	DRY	U	SW8080
∑130	CC-BC-06	PCB-1248	<12	PPB	DRY	U	SW8080
∑130	CC-BC-06	PCB-1254	<3	PPB	DRY	U	SW8080
∑130	CC-BC-06	PCB-1260	<10	PPB	DRY	U	SW8080
	CC-BC-06	TCMX (SURROGATE)	30	PCT		#	SW8080
	CC-BC-06	DCB (SURROGATE)	41	PCT		#	SW8080
	CC-BC-06	B/NA Extractables Soil				#	SW8270C
	CC-BC-06	bis(2-Chloroethyl)ether	<220	PPB	DRY	U	SW8270C
420	CC-BC-06	Phenol	<230	PPB	DRY	U	SW8270C
	CC-BC-06	2-Chlorophenol	<200	PPB	DRY	U	SW8270C
170	CC-BC-06	1,3-Dichlorobenzene	<200	PPB	DRY	U	SW8270C
110	CC-BC-06	1,4-Dichlorobenzene	<200	PPB	DRY	U	SW8270C
35	CC-BC-06	1,2-Dichlorobenzene	<220	PPB	DRY	U	SW8270C
	CC-BC-06	2,2'-oxybis(1-Chloropropane	<220	PPB	DRY	U	SW8270C
63	CC-BC-06	2-Methyl Phenol	<280	PPB	DRY	U	SW8270C
1400	CC-BC-06	Hexachloroethane	<230	PPB	DRY	U	SW8270C
28	CC-BC-06	N-Nitroso-di-n-propylamine	<240	PPB	DRY	U	SW8270C
670	CC-BC-06	3&4-Methyl Phenol	<820	PPB	DRY	U	SW8270C
	CC-BC-06	Nitrobenzene	<240	PPB	DRY	U	SW8270C
	CC-BC-06	Isophorone	<210	PPB	DRY	U	SW8270C
	CC-BC-06	2-Nitrophenol	<170	PPB	DRY	U	SW8270C
29	CC-BC-06	2,4-Dimethylphenol	<230	PPB	DRY	U	SW8270C
	CC-BC-06	bis (2-Chloroethoxy)	<220	PPB	DRY	U	SW8270C
	CC-BC-06	2,4-Dichlorophenol	<180	PPB	DRY	U	SW8270C
31	CC-BC-06	1,2,4-Trichlorobenzene	<210	PPB	DRY	U	SW8270C
2100	CC-BC-06	Naphthalene	<210	PPB	DRY	U	SW8270C
29	CC-BC-06	Hexachlorobutadiene	<200	PPB	DRY	U	SW8270C
	CC-BC-06	4-Chloro-3-methylphenol	200	PPB	DRY	U	SW8270C
670	CC-BC-06	2-Methyl Naphthalene	<180	PPB	DRY	U	SW8270C
	CC-BC-06	Hexachlorocyclopentadiene	<94	PPB	DRY	U	SW8270C
	CC-BC-06	2,4,6-Trichlorophenol	<180	PPB	DRY	U	SW8270C
	CC-BC-06	2,4,5-Trichlorophenol	<230	PPB	DRY	U	SW8270C
	CC-BC-06	2-Chloronaphthalene	<210	PPB	DRY	U	SW8270C
560	CC-BC-06	Acenaphthylene	<210	PPB	DRY	U	SW8270C
1400	CC-BC-06	Dimethyl Phthalate	<170	PPB	DRY	U	SW8270C
500	CC-BC-06	Acenapthene	<150	PPB	DRY	U	SW8270C
	CC-BC-06	2,4-Dinitrophenol	<70	PPB	DRY	U	SW8270C
	CC-BC-06	2,4-Dinitrotoluene	<150	PPB	DRY	U	SW8270C
	CC-BC-06	4-Nitrophenol	<200	PPB	DRY	U	SW8270C
540	CC-BC-06	Fluorene	<150	PPB	DRY	U	SW8270C
	CC-BC-06	4-Chlorophenyl Phenyl Ether	<190	PPB	DRY	U	SW8270C
1200	CC-BC-06	Diethyl Phthalate	<140	PPB	DRY	U	SW8270C

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	CC-BC-06	2-Methyl-4,6-dinitrophenol	<110	PPB	DRY	U	SW8270C
28	CC-BC-06	N-Nitrosodiphenylamine	<100	PPB	DRY	U	SW8270C
	CC-BC-06	4-Bromophenyl Phenyl Ether	<150	PPB	DRY	U	SW8270C
22	CC-BC-06	Hexachlorobenzene	<130	PPB	DRY	U	SW8270C
400	CC-BC-06	Pentachlorophenol	<110	PPB	DRY	U	SW8270C
1500	CC-BC-06	Phenanthrene	<120	PPB	DRY	U	SW8270C
960	CC-BC-06	Anthracene	<150	PPB	DRY	U	SW8270C
5100	CC-BC-06	Di-n-butylphthalate	<140	PPB	DRY	U	SW8270C
1700	CC-BC-06	Fluoranthene	<120	PPB	DRY	U	SW8270C
	CC-BC-06	Benzidine	<1700	PPB	DRY	U	SW8270C
2600	CC-BC-06	Pyrene	<130	PPB	DRY	U	SW8270C
970	CC-BC-06	Butyl Benzyl Phthalate	<130	PPB	DRY	U	SW8270C
	CC-BC-06	3,3'-Dichlorbenzidine	<900	PPB	DRY	U	SW8270C
1300	CC-BC-06	Benzo(a)anthracene	<130	PPB	DRY	U	SW8270C
1400	CC-BC-06	Chrysene	<150	PPB	DRY	U	SW8270C
8300	CC-BC-06	bis(2-Ethylhexyl)phthalate	<110	PPB	DRY	U	SW8270C
6200	CC-BC-06	Di-n-octyl phthalate	<110	PPB	DRY	U	SW8270C
600	CC-BC-06	Indeno (1,2,3-cd)Pyrene	<94	PPB	DRY	U	SW8270C
3200	CC-BC-06	Benzo(b,k)fluoranthene	<180	PPB	DRY	U	SW8270C
1600	CC-BC-06	Benzo(a)pyrene	<150	PPB	DRY	U	SW8270C
230	CC-BC-06	Dibenzo(a,h)Anthracene	<150	PPB	DRY	U	SW8270C
670	CC-BC-06	Benzo (g,h,i) perylene	<91	PPB	DRY	U	SW8270C
	CC-BC-06	2-FLUOROPHENOL (SURR)	63	PCT		#	SW8270C
	CC-BC-06	PHENOL-D5 (SURR)	68	PCT		#	SW8270C
	CC-BC-06	NITROBENZENE-D5 (SURR)	60	PCT		#	SW8270C
	CC-BC-06	2-FLUOROBIPHENYL (SURR)	36	PCT		#	SW8270C
	CC-BC-06	2,4,6-TRIBROMOPHENOL (SURR)	57	PCT		#	SW8270C
	CC-BC-06	TERPHENYL-D14 (SURR)	42	PCT		#	SW8270C
	CC-BC-06	Metals Anlaysis ICP-AES				#	6010B
390	CC-BC-06	Copper	49.2	PPM	DRY	#	6010B
140	CC-BC-06	Nickel	20.3	PPM	DRY	#	6010B
410	CC-BC-06	Zinc	119	PPM	DRY	#	6010B
150	CC-BC-06	Antimony		PPM	DRY	UJ	6010B
57	CC-BC-06	Arsenic	9.77	PPM	DRY	#	6010B
450	CC-BC-06	Lead	17.6	PPM	DRY	#	6010B
5.1	CC-BC-06	Cadmium	<0.285	PPM	DRY	U	6010B
6.1	CC-BC-06	Silver	<0.855	PPM	DRY	U	6010B
	CC-BC-06	Mercury CVAAS				#	EPA7471A
0.41	CC-BC-06	Mercury	0.12	PPM	DRY	#	EPA7471A
	CC-BC-06	Organotin - Water				#	KRONE
0.15	CC-BC-06	Tetrabutyltin	<0.05	UGL	POR	U	KRONE
0.15	CC-BC-06	Tributyltin	<0.02	UGL	POR	U	KRONE
0.15	CC-BC-06	Dibutyltin	<0.05	UGL	POR	U	KRONE

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0.15	CC-BC-06	Monobutyltin	<0.05	UGL	POR	U	KRONE
	CC-BC-06	Organotin - Soil				#	KRONE
*73	CC-BC-06	Tetrabutyltin	<3.2	PPB	DRY	U	KRONE
*73	CC-BC-06	Tributyltin	<3.2	PPB	DRY	U	KRONE
*73	CC-BC-06	Dibutyltin	<3.2	PPB	DRY	U	KRONE
*73	CC-BC-06	Monobutyltin	3.2	PPB	DRY	UJ	KRONE
	CC-BC-06	Percent Solids	35	PCT		#	#
	CC-BC-06	Percent moisture	65	PCT		#	#
	CC-BC-06	Volatile Solids/Org. Matter	9	PCT		#	#
	CC-BC-06	Moisture Content of Soil	190	PCT		#	#

*not a DMEF - SL