

29 May 1998

**MEMORANDUM FOR RECORD**

**SUBJECT: DETERMINATION OF THE SUITABILITY OF DREDGED MATERIAL TESTED UNDER DMMP EVALUATION PROCEDURES FOR TOKELAND MARINA ENTRANCE CHANNEL AND MOORING BASIN, WILLAPA HARBOR, FOR DISPOSAL AT THE GOOSE POINT OR CAPE SHOALWATER OPEN WATER DISPOSAL SITES.**

1. The Corps of Engineers and the Port of Willapa Harbor propose to dredge approximately 76,000 cubic yards from the Tokeland Marina Entrance Channel and Mooring Basin at Tokeland WA. The following summary reflects the DMMP agencies (Corps of Engineers, Department of Ecology, Department of Natural Resources and the Environmental Protection Agency) consensus decision on the acceptability of the sampling plan and all relevant test data to make a determination of suitability for the disposal of the material at the Willapa Bay Goose Point or Cape Shoalwater open-water disposal sites.

2. Sediments in the entrance channel were ranked "low" based on the chemical testing conducted in 1993, the lack of potential chemical sources and the homogeneity of the sediments. Sediments in the mooring basin were ranked "moderate."

3. A sampling and analysis plan was completed for this project and approved by the DMMP agencies on 21 February 1998. Sampling for this project was performed on 31 March 1998.

SAP Approval Date	6 March 1998
Sampling dates	31 March 1998
Data Report submittal date	20 May 1998
Recency determination dates	31 March 2003 (moderate) 31 March 2005 (low)

4. Four DMMUs were characterized, with a total of 16 samples taken. Due to the homogenous nature of the material, grab samples were considered sufficient for characterization of the material. DMMU C-1 was comprised of five samples taken from the entrance channel. DMMU C-2 was comprised of 3 samples from the marina area adjacent to the entrance channel. DMMU C-3 was comprised of 4 samples from the southeast section of the marina and DMMU C-4 was comprised of 5 samples from the northwest section of the marina.

5. There were no exceedances of Dredging Year 1998 DMMP screening levels. There were no detection limits above screening level.

6. In summary, the DMMP-approved sampling and analysis plan was followed, and quality assurance, quality control guidelines specified by the DMMP agencies were followed. The data gathered were deemed sufficient and acceptable for Regulatory decision-making under the DMMP program. Based on the results of the chemical testing, the consensus determination of the DMMP agencies is that all 76,000 cubic yards of sediment proposed to be dredged from the Tokeland Marina Entrance Channel and Mooring Basin at Tokeland WA is suitable for disposal at a Willapa Bay open-water disposal site.

7. The chemical analytical data were also compared to the State Sediment Management Standards, including the analysis of chromium. No chemicals exceeded SMS criteria. One chemical, hexachlorobenzene had TOC-normalized detection limits above the criteria. Using guidance from the DMMP agencies, the dry weight detection limits (17-20 $\mu$ g/kg) were compared to the draft 1996 SMS detection limit for hexachlorobenzene (22 $\mu$ g/kg dry weight) and all detection limits were achieved. Based on this information, the DMMP agencies determined that the sediments from the Tokeland Marina Entrance Channel and Mooring Basin are chemically suitable for use in beneficial uses projects. Sediment conventional data is included in Table 1.

8. This memorandum documents the suitability of proposed dredged sediments for disposal at a Willapa Bay open water disposal site, and the chemical suitability of the material for proposed beneficial uses. It does not constitute final agency approval of the project. A final decision will be made after full consideration of agency input, and after an alternatives analysis is done under section 404 (b) 1 of the Clean Water Act.

**Concur:**

6/4/98  
Date

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**Table 1. Sediment Conventional Parameters**

<b>DMMU</b>	<b>C-1</b>	<b>C-2</b>	<b>C-3</b>	<b>C-4</b>
Total Solids (%)	42.2	35.6	36.4	26.2
Total Organic Carbon (%)	2.7	3.2	2.7	2.8
Bulk Ammonia (mg/kg)	17	25	27	29
Total Sulfides (mg/kg)	20U	28	22U	22U
Grain-size				
gravel	2.6	0.6	1.4	0.9
sand	31.7	9.3	8.8	7.5
silt	38.6	57.6	57.3	57.5
clay	27	32.8	32.6	34.2

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DMMO file

Project: USACE-Tokepoint/Tokeland Marina (DY98)

TOKPT1AF120

	SL	Units	C1	C2	C3	C4
<b>SEDIMENT CONVENTIONALS</b>						
Total Solids	---	%	42.2	35.6	36.4	26.2
Volatile Solids	---	%	8.7	10	9.3	9.2
Total Organic Carbon	---	%	2.7	3.2	2.7	2.8
Ammonia	---	MG/KG	17	25	27	29
Total Sulfides	---	MG/KG	20 u	28	22 u	22 u
<b>METALS</b>						
Antimony	150	MG/KG	0.02 u	0.01 u	0.02 u	0.02 u
Arsenic	57	MG/KG	0.18	0.16	0.15	0.25
Cadmium	5.1	MG/KG	0.11 u	0.11 u	0.12 u	0.16 u
Chromium	---	MG/KG	39	32	37	56
Copper	390	MG/KG	0.07	0.06	0.07	0.1
Lead	450	MG/KG	0.06	0.05	0.08	0.09
Mercury	0.41	MG/KG	0.12 u	0.15	0.15 u	0.2
Nickel	140	MG/KG	0.16	0.13	0.18	0.24
Selenium	---	MG/KG	-	-	-	-
<b>LPAH</b>						
Silver	6.1	MG/KG	0.11 u	0.11 u	0.12 u	0.16 u
Zinc	410	MG/KG	0.27	0.22	0.27	0.39
2-Methylnaphthalene	670	UG/KG	0.05 u	0.06 u	0.06 u	0.06 u
Acenaphthene	500	UG/KG	0.07 u	0.08 u	0.08 u	0.08 u
Acenaphthylene	560	UG/KG	0.06 u	0.07 u	0.07 u	0.07 u
Anthracene	960	UG/KG	0.04 u	0.04 u	0.04 u	0.04 u
Fluorene	540	UG/KG	0.06 u	0.07 u	0.07 u	0.07 u
Naphthalene	2100	UG/KG	0.02 u	0.02 u	0.02 u	0.02 u
<b>HPAH</b>						
Phenanthrene	1500	UG/KG	0.02 u	0.03 u	0.03 u	0.03 u
Total LPAH	5200	UG/KG	0.01 u	0.01 u	0.01 u	0.01 u
Benzo(a)anthracene	1300	UG/KG	0.03 u	0.03 u	0.03 u	0.03 u
Benzo(a)pyrene	1600	UG/KG	0.02 u	0.03 u	0.03 u	0.02 u
Benzo(g,h,i)perylene	670	UG/KG	0.05 u	0.06 u	0.06 u	0.06 u
Benzofluoranthenes	3200	UG/KG	0.01 u	0.01 u	0.01 u	0.01 u
Chrysene	1400	UG/KG	0.02 u	0.03 u	0.03 u	0.03 u
Dibenzo(a,h)anthracene	230	UG/KG	0.15 u	0.17 u	0.17 u	0.17 u
Fluoranthene	1700	UG/KG	0.02 u	0.04	0.03	0.02 u
Indeno(1,2,3-c,d)pyrene	600	UG/KG	0.06 u	0.07 u	0.07 u	0.07 u
<b>CHLORINATED HYDROCARBONS</b>						
Pyrene	2600	UG/KG	0.01 u	0.02	0.02 u	0.02 u
Total HPAH	12000	UG/KG	0 u	0.01	0	0 u
1,2,4-Trichlorobenzene	31	UG/KG	0.32 u	0.39 u	0.39 u	0.39 u
1,2-Dichlorobenzene	35	UG/KG	0.14 u	0.17 u	0.17 u	0.14 u
1,3-Dichlorobenzene	170	UG/KG	0.03 u	0.04 u	0.04 u	0.03 u
<b>PHTHALATES</b>						
1,4-Dichlorobenzene	110	UG/KG	0.05 u	0.05 u	0.05 u	0.05 u
Hexachlorobenzene	22	UG/KG	0.77 u	0.91 u	0.91 u	0.91 u
Bis(2-ethylhexyl)phthalate	1300	UG/KG	0.03 u	0.03 u	0.05	0.03 u
Butyl benzyl phthalate	63	UG/KG	0.54 u	0.63 u	0.63 u	0.62 u
Di-n-butyl phthalate	1400	UG/KG	0.02 u	0.03 u	0.03 u	0.03 u
Di-n-octyl phthalate	6200	UG/KG	0.01 u	0.01 u	0.01 u	0.01 u
<b>PHENOLS</b>						
Diethyl phthalate	200	UG/KG	0.17 u	0.2 u	0.2 u	0.2 u
Dimethyl phthalate	71	UG/KG	0.48 u	0.56 u	0.56 u	0.55 u
2 Methylphenol	63	UG/KG	0.27 u	0.32 u	0.32 u	0.32 u
2,4-Dimethylphenol	29	UG/KG	0.59 u	0.69 u	0.69 u	0.69 u
4 Methylphenol	670	UG/KG	0.05 u	0.06 u	0.06 u	0.06 u
<b>MISCELLANEOUS EXTRACTABLES</b>						
Pentachlorophenol	400	UG/KG	0.22 u	0.25 u	0.25 u	0.25 u
Phenol	420	UG/KG	0.08 u	0.1 u	0.1 u	0.09 u

	SL	Units	C1	C2	C3	C4
Benzoic acid	650	UG/KG	0.26 u	0.31 u	0.31 u	0.31 u
Benzyl alcohol	57	UG/KG	0.37 u	0.42 u	0.42 u	0.4 u
Dibenzofuran	540	UG/KG	0.06 u	0.07 u	0.07 u	0.07 u
Hexachlorobutadiene	29	UG/KG	0.72 u	0.83 u	0.83 u	0.79 u
VOLATILE ORGANICS						
Hexachloroethane	1400	UG/KG	0.02 u	0.03 u	0.03 u	0.03 u
N-Nitrosodiphenylamine	28	UG/KG	0.75 u	0.86 u	0.86 u	0.82 u
Ethylbenzene	10	UG/KG	0.5 u	0.6 u	0.6 u	0.5 u
Tetrachloroethene	57	UG/KG	0.09 u	0.11 u	0.11 u	0.09 u
PESTICIDES AND PCBs						
Total Xylene	40	UG/KG	0.13 u	0.15 u	0.15 u	0.13 u
Trichloroethene	160	UG/KG	0.03 u	0.04 u	0.04 u	0.03 u
Aldrin	10	UG/KG	0.1 u	0.12 u	0.12 u	0.12 u
Chlordane	10	UG/KG	0.28 u	0.31 u	0.32 u	0.31 u
Dieldrin	10	UG/KG	0.14 u	0.16 u	0.16 u	0.16 u
Heptachlor	10	UG/KG	0.1 u	0.12 u	0.12 u	0.12 u
Lindane	10	UG/KG	0.1 u	0.12 u	0.12 u	0.12 u
Total DDT	6.9	UG/KG	0.51 u	0.57 u	0.57 u	0.29 u
Total PCBs	130	UG/KG	0.53 u	0.6 u	0.62 u	0.6 u

Note: a cell with a single dash indicates that no data exists for this analyte in DAIS

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