

MEMORANDUM FOR RECORD

SUBJECT: DETERMINATION REGARDING THE SUITABILITY OF PROPOSED DREDGED MATERIAL FROM THE PORT OF GRAYS HARBOR TERMINAL 1 AT ABERDEEN FOR UNCONFINED OPEN WATER DISPOSAL AT THE SOUTH JETTY OR POINT CHEHALIS OPEN WATER DISPOSAL SITES

1. Introduction. This memorandum reflects the consensus determination of the Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Washington Departments of Ecology and Natural Resources, and the U.S. Environmental Protection Agency) regarding the suitability of 66,000 cubic yards of dredged material from Port of Grays Harbor Terminal 1 enhancement project for disposal at the South Jetty or Point Chehalis open-water disposal sites.

2. Background. The Port of Grays Harbor is proposing to modify Terminal 1 to accommodate Panamax vessels and ocean-going barges. As a part of this modification, the Port needs to increase the dredging depth at Terminal 1 to - 41 ft MLLW. Current maintenance depth is - 30 ft MLLW. This area is ranked moderate, based on guidance in the DMMP User's Manual.

3. Project Summary. Table 1 includes project summary and tracking information.

Table 1. Project Summary

Project ranking	Moderate
Proposed Dredging volume	66,000 cubic yards
Proposed Dredging depth	- 41 feet MLLW
SAP Received	10 January 2009
SAP Approved	21 January 2009
Sampling Dates	10-11 February 2009
Data report received	13 April 2009
DAIS Tracking Number	POGH1-1-A-F-272
USACE Permit Application Number	NWS-2009-601-SO
Recency Determination (Moderate = 5 to 7 Years)	10 February 2014 – 10 January 2016

4. Project Sampling. Core samples were taken from two locations using a vibracore. Due to the configuration of the proposed dredge prism, samples were composited vertically for analysis. Two analyses of the material were completed. Z-samples and surface samples were collected from both core locations and archived. The sampling

and compositing scheme is outlined in Table 2. Sample locations are illustrated in Figure 1.

5. Chemical Analysis. Sediments were evaluated for the standard list of DMMP chemicals of concern. Dioxins and furans were also analyzed. Sediment conventional results are listed in Table 3. There were no exceedances of DMMP screening guidelines. Bioassay testing was not required. In addition to routine DMMP chemicals of concern, analysis of dioxins/furans was required for this project. These chemicals are widespread in Grays Harbor due to the historical presence of bleach process pulp mills. Dioxins/furans had not been analyzed in Port of Grays Harbor sediments since the early to mid 1990s and the agencies required confirmation testing for this round of sediment characterization.

Results (Table 5) showed detected levels of dioxins/furans in both samples. Toxic Equivalence (TEQ) (with non-detects calculated as ½ reporting limit) were 1.07 ng/kg dry wt for DMMU and 1.11 ng/kg dry wt for DMMU 2, below the 15 ng/kg TEQ suitability level set for Grays Harbor.

The approved sampling and analysis plan was followed and quality control guidelines specified by the PSEP and DMMP guidelines were met.

6. Suitability Determination. This memorandum documents the evaluation of the suitability of sediment proposed for dredging from Port of Grays Harbor Terminal 1 Enhancement for open-water disposal. The approved sampling and analysis plan was followed. The data gathered were deemed sufficient and acceptable for regulatory decision-making under the DMMP program.

Based on the results of the previously described testing, the DMMP agencies conclude that **66,000 cubic yards are suitable** for open-water disposal at the South Jetty or Point Chehalis open water disposal sites. This suitability determination does ***not*** constitute final agency approval of the project. A completed JARPA application must be submitted to all DMMP agencies. During the public comment period that follows a public notice, the resource agencies will provide input on the overall 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.

A pre-dredge meeting with DNR, Corps of Engineers and Washington Department of Ecology will be required. A dredging quality control plan must be developed and submitted to the Regulatory Branch of the Seattle District Corps of Engineers at least 7 days prior to the pre-dredge meeting. A DNR site use authorization must also be acquired.

8. Agency Signatures.

Concur:

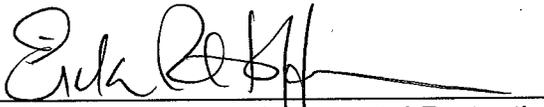
6/3/09

Date


Stephanie Stirling, Seattle District Corps of Engineers

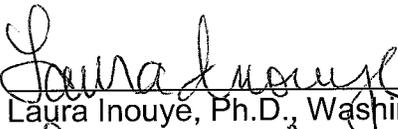
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Erika Hoffman, Environmental Protection Agency

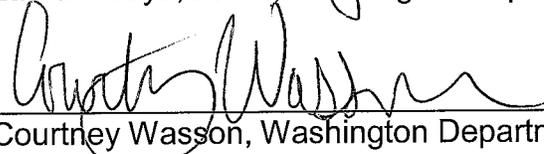
6/04/09

Date


Laura Inouye, Ph.D., Washington Department of Ecology

6/4/09

Date


Courtney Wasson, Washington Department of Natural Resources

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DMMP Agencies

Jim Green, Corps Regulatory

Susan Fitzgerald, Integral Consulting

Table 2. Sediment Compositing Scheme

DMMU Number	Sample Core Sections	DMMU Volume
1	T1-1, 1-2 T1-3, T1-4	33,000
2	T1-5, T1-6 T1-7, T1-8	33,000

Table 3. Sediment Conventional Data.

		DMMU 1	DMMU 2
DAIS ID:		C1	C2
GRAIN SIZE	% Gravel:	0.1	0.1
	% Sand:	42.2	30.5
	% Silt:	42.4	49.4
	% Clay:	15.2	20.1
	% Fines (clay+silt):	57.7	69.4
Total Solids (%):		65.7	58.8
Volatile Solids (%):		4.51	5.25
Total Organic Carbon (%):		1.6	1.4
Total Sulfides (mg/kg):		384	98.3
Total Ammonia (mg N/kg):		133	109

Table 4. Chemical results compared to DMMP regulatory guidelines.

CHEMICAL	SL	BT	ML	DMMU 1		DMMU 2	
				conc	QL	conc	QL
METALS (mg/kg dry)							
Antimony	150	---	200	20	u, j	8	u, j
Arsenic	57	507	700	20	u	8	u
Cadmium	5.1	11.3	14	0.7	u	0.3	u
Chromium	---	267	---	37		36.2	
Copper	390	1,027	1,300	60.6		51	
Lead	450	975	1,200	7	u, j	6	
Mercury	0.41	1.5	2.3	0.07	u, j	0.07	u
Nickel	140	370	370	31		27	
Selenium	---	3.0	---	0.8	u, j	0.8	u
Silver	6.1	6.1	8.4	1	u, j	0.5	u
Zinc	410	2,783	3,800	77		71	
Organometallic Compounds							
Tributyltin (ug/kg dry)				na		na	
LPAH (ug/kg dry)							
2-Methylnaphthalene	670	---	1,900	20	u	19	u
Acenaphthene	500	---	2,000	20	u	19	u
Acenaphthylene	560	---	1,300	20	u	19	u
Anthracene	960	---	13,000	20	u	19	u
Fluorene	540	---	3,600	20	u	19	u
Naphthalene	2,100	---	2,400	20	u	19	u
Phenanthrene	1,500	---	21,000	20	u	19	u
Total LPAH	5,200	---	29,000	20	u	19	u
HPAH (ug/kg dry)							
Benzo(a)anthracene	1,300	---	5,100	20	u	19	u
Benzo(a)pyrene	1,600	---	3,600	20	u	19	u
Benzo(g,h,i)perylene	670	---	3,200	20	u	19	u
Benzofluoranthenes	3,200	---	9,900	20	u	19	u
Chrysene	1,400	---	21,000	20	u	19	u
Dibenzo(a,h)anthracene	230	---	1,900	6.1	u	6.1	u
Fluoranthene	1,700	4,600	30,000	20	u	19	u
Indeno(1,2,3-c,d)pyrene	600	---	4,400	20	u	19	u
Pyrene	2,600	11,980	16,000	20	u	19	u
Total HPAH	12,000	---	69,000	20	u	19	u
CHLORINATED HYDROCARBONS (ug/kg dry)							
1,2,4-Trichlorobenzene	31	---	64	6.1	u	6.1	u
1,2-Dichlorobenzene	35	---	110	6.1	u	6.1	u
1,3-Dichlorobenzene	170	---	---	20	u	19	u
1,4-Dichlorobenzene	110	---	120	6.1	u	6.1	u
Hexachlorobenzene	22	168	230	6.1	u	6.1	u
PHTHALATES (ug/kg dry)							
Bis(2-ethylhexyl)phthalate	1,300	---	8,300	13	j	19	u

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Butyl benzyl phthalate	63	---	970	15	u	15	u
Di-n-butyl phthalate	1,400	---	5,100	20	u	19	u
Di-n-octyl phthalate	6,200	---	6,200	20	u	19	u
Diethyl phthalate	200	---	1,200	20	u	19	u
Dimethyl phthalate	71	---	1,400	20	u	19	u
PHENOLS (ug/kg dry)							
2 Methylphenol	63	---	77	6.1	u	6.1	u
2,4-Dimethylphenol	29	---	210	6.1	u	6.1	u
4 Methylphenol	670	---	3,600	20	u	19	u
Pentachlorophenol	400	504	690	30	u	19	u
Phenol	420	---	1,200	20	u	30	u
MISCELLANEOUS EXTRACTABLES (ug/kg dry)							
Benzoic acid	650	---	760	200	u	190	u
Benzyl alcohol	57	---	870	30	u	30	u
Dibenzofuran	540	---	1,700	20	u	19	u
Hexachlorobutadiene	29	---	270	20	u	19	u
Hexachloroethane	1,400	---	14,000	6.1	u	6.1	u
N-Nitrosodiphenylamine	28	---	130	6.1	u	6.1	u
VOLATILE ORGANICS (ug/kg dry) (1)							
Ethylbenzene	10	---	50	na	u	na	u
Tetrachloroethene	57	---	210	na	u	na	u
Total Xylene	40	---	160	na	u	na	u
Trichloroethene	160	---	1,600	na	u	na	u
PESTICIDES AND PCBs (ug/kg dry)							
Aldrin	10	---	---	0.94	u	0.99	u
Chlordane	10	37	---	1.9	u	2	u
Dieldrin	10	---	---	1.9	u	2	u
Heptachlor	10	---	---	0.94	u	0.99	u
Lindane	10	---	---	0.94	u	0.99	u
Total DDT	6.9	50	69	1.9	u	2	u
Total PCBs	130	---	3,100	20	u	20	u
Total PCBs (mg/kg OC)	---	38	---				
(1) Volatiles analyses were omitted from this project							
QL = laboratory qualifier							
u = undetected							
j = estimated value							
OC = organic carbon							
SL = screening level							
BT = bioaccumulation trigger							
ML = maximum level							

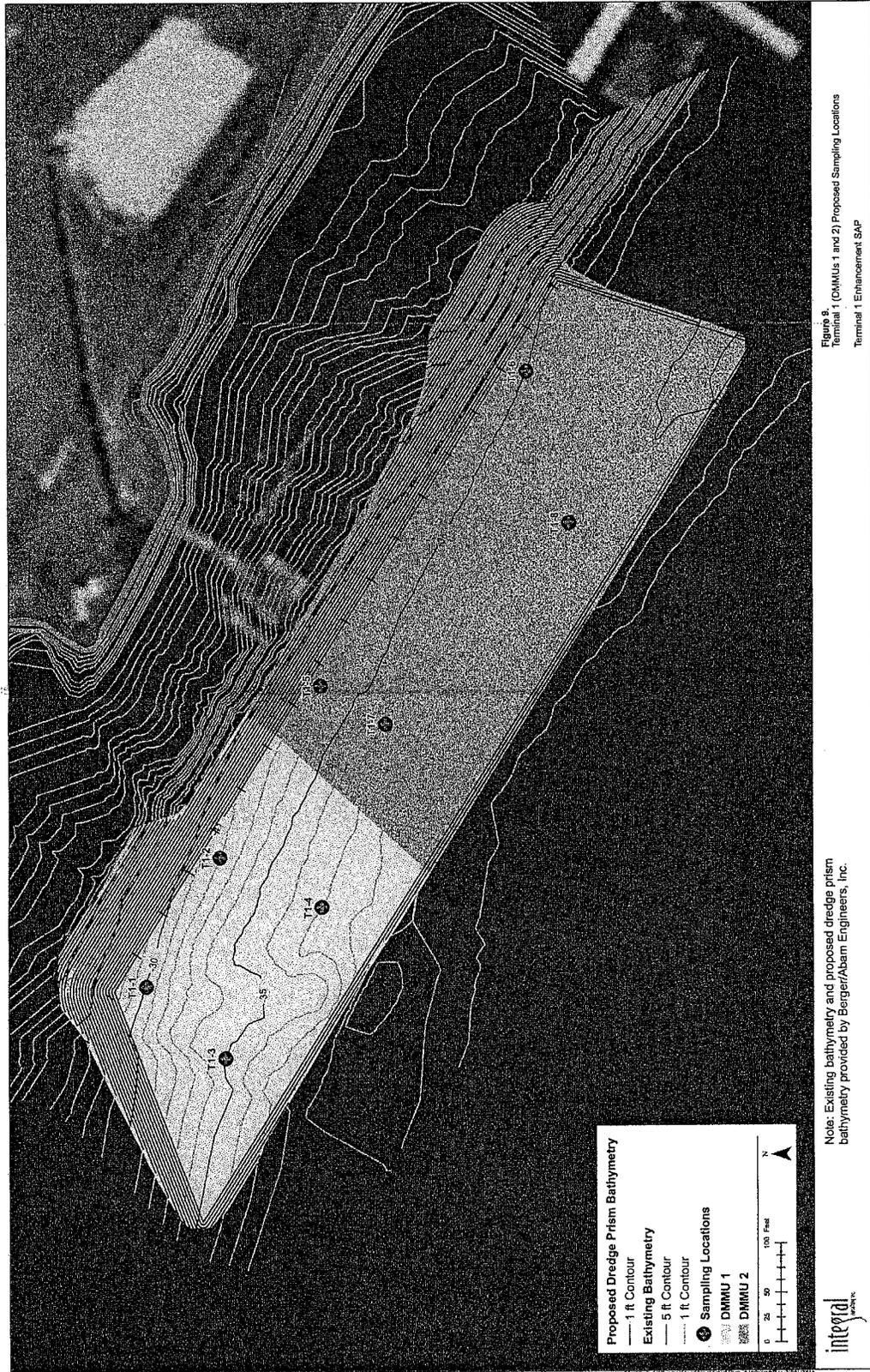


Figure 1.

Table 5. Dioxins/Furans Data and TEQ Calculations

CHEMICAL	TEF	DMMU 1			DMMU 2		
		conc	QL	TEQ	conc	QL	TEQ
DIOXINS (ng/kg dry)							
2,3,7,8-TCDD	1	0.38	J	0.3800	0.411	U	0.4110
1,2,3,7,8-PeCDD	1	0.31	J	0.3210	0.418	U	0.4180
1,2,3,4,7,8-HxCDD	0.1	0.086	J	0.0080	0.0902	U	0.0090
1,2,3,6,7,8-HxCDD	0.1	0.589	J	0.0600	0.514	U	0.0514
1,2,3,7,8,9-HxCDD	0.1	0.628	J	0.0600	0.886	U	0.0886
1,2,3,4,6,7,8-HpCDD	0.01	5.2		0.0520	5.11		0.0511
OCDD	0.0003	33.8		0.0100	32.9		0.0099
FURANS (ng/kg dry)							
2,3,7,8-TCDF	0.1	0.9		0.0900	ND	J	
1,2,3,7,8-PeCDF	0.03	0.17	J	0.0050	ND	U	
2,3,4,7,8-PeCDF	0.3	0.138	J	0.0414	0.0569	J	0.0171
1,2,3,4,7,8-HxCDF	0.1	0.17	J	0.0170	0.136	J	0.0136
1,2,3,6,7,8-HxCDF	0.1	0.108	J	0.0108	0.0814	J	0.0081
1,2,3,7,8,9-HxCDF	0.1	0.042	J	0.0042	ND	U	
2,3,4,6,7,8-HxCDF	0.1	0.144	J	0.0144	0.116	J	0.0116
1,2,3,4,6,7,8-HpCDF	0.01	1.52	J	0.0152	3.25		0.0325
1,2,3,4,7,8,9-HpCDF	0.01	0.064	J	0.0006	ND	U	
OCDF	0.0003	2.85	J	0.0009	3.65	J	0.0011
Total TEQ				1.0905			1.1230

J = estimated concentration

U = undetected

QL = laboratory qualifier

TEF = toxicity equivalence factor

TEQ = toxicity equivalents

ng/kg = nanogram/kilogram (parts per trillion)