CENWS-OD-TS-DM

MEMORANDUM FOR RECORD 11 May 2005

SUBJECT: DETERMINATION ON THE SUITABILITY OF MAINTENANCE MATERIAL DREDGED FROM THE LAKE CROCKETT NAVIGATION PROJECT (KEYSTONE FERRY TERMINAL), WHIDBEY ISLAND, WA. (CENWS-OD-TS-NS-24) FOR DISPOSAL ALONG AN ADJACENT SHORELINE AS A BENEFICIAL USE BEACH RENOURISHMENT

1. The Corps proposes to maintenance dredge approximately 40,000 cy of littoral drift sand and gravel shoaling on the west toe of the navigation channel from the Lake Crockett Navigation Project, and proposes to dispose of this material as a beneficial use to nourish the beach on the east side of the breakwater (see **Figure 1**). The navigation channel has disrupted the littoral drift on the east side of the channel, and beach renourishment is necessary to replenish the sand normally deposited by littoral drift. Material from this project was previously dredged and used to renourish the beach at the same location in 1987, 1993, and 1999.

2. Relevant dates for regulatory tracking purposes are included in Table 1.

Table 1. Regulatory Tracking Information and Dates

Navigation Section Public Notice:	CENWS-OD-TS-NS-24
Dredging History:	1987, 1993, 1999, proposed 2005
Date of last no-test SDM for BU/Beach Nourishment:	August 7, 1998
Previous Testing History:	1975, 1976, 1982, 1988
Last Sampling date for chemical characterization:	November 6, 1988
Volume proposed for dredging:	40,000
Area Rank/Recency for Testing: Low (7 years)	

3. The material to be dredged is ranked low concern for characterization by the DMMP agencies (Corps, EPA, Ecology, DNR). This material is composed of sand and gravel eroding from naturally unaltered bluffs to the west of the navigation channel. Previous characterization of the material in 1975, 1976, 1982, and 1988 classified this material as being sandy gravel (less than 3% fines). The 1988 characterization also involved a full PSDDA characterization of two composited samples, one analysis of material from the **east side of the entrance channel** and one analysis of material from the **west side of the entrance channel**, to assess sediment quality suitability for material being moved by littoral drift from west to east into the navigation channel for beach nourishment on the beach on the **east side** of the channel. The results of these analyses (**Table 2**) showed that all chemicals of concern from the composited sample west of the channel were quantitated below the SL and SMS screening quality standards criteria. The composited sample from the area east of the channel, the receiving area for nourishment material were generally below SL and SQS, except Phenol, which was quanititated above the SL and SQS.

4. The material also meets exclusionary criteria under CWA: 40 CFR 230.60 (subparagraphs a, b, and c). The exclusionary criteria state that material meets the criteria and can be excluded

from further testing if it is: (1) predominantly sand from a high current/wave energy area; and (2) dredging area is sufficiently removed from contaminant sources; and (3) where the disposal site is adjacent to the dredging site. The dredging/disposal area is in a highly dynamic littoral drift current/tidal area, and is free from any known sources of contamination.

5. This Project was coordinated with the DMMP agencies and the DMMP agencies have concurred that the material does not require further testing under Section 404 of the CWA. They came to this conclusion after evaluating the site history and verifying that there have not been any documented spills or actions which have altered the reason-to-believe since the last maintenance dredging in 1999, that the sediment quality remains high in the vicinity of the proposed maintenance dredging.

6. This memorandum documents the suitability of proposed dredged sediments under the CWA for unconfined open-water disposal as a beneficial uses project to renourish the beach on the east side of the Lake Crockett navigation channel. It does not constitute final agency approval of the project. A public notice was issued for this project dated May 2005. During the public comment period, which 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.

Concur:

5/12/05 — David R. Kendall
Date — David Kendall, Ph.D., Seattle District Corps of Engineers

5/12/05 — Cinde Donoghue
Date — Cinde Donoghue, Washington Department of Ecology

5/12/05 — Jonathan R Freedman / John Malek
Date — Jonathan Freedman/John Malek, Environmental Protection Agency, Region 10

May 12, 2005 — Peter Leon
Date — Peter Leon, Washington Department of Natural Resources

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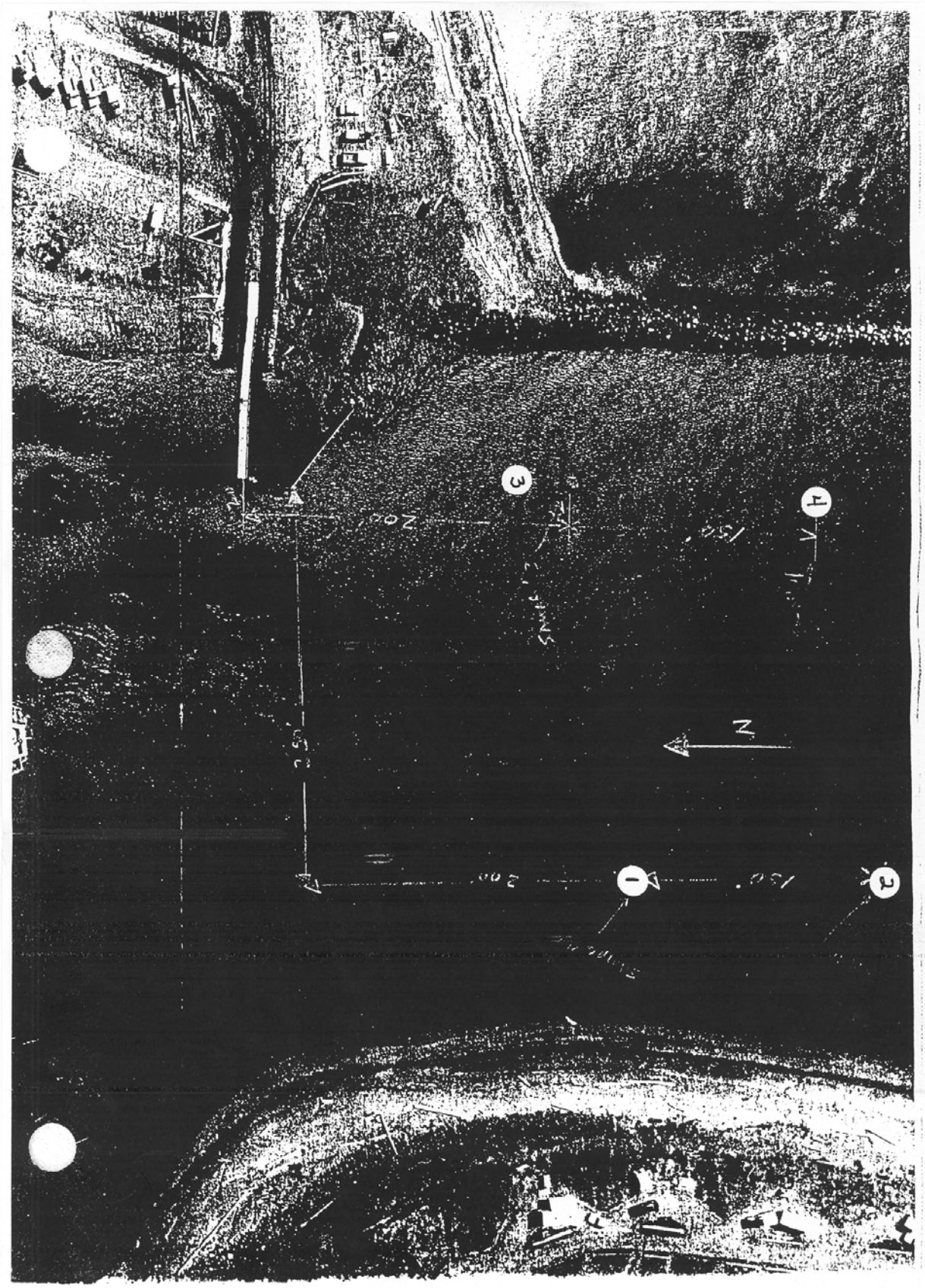

Figure 1. Core Sample locations.

Table 2. Keystone Ferry Terminal Sediment Characterization Summary for Beach Nourishment (1988)

								C-1 (West)*			C-2 (East)*		
	DMMP				SMS			dry wgt	TOC-norm	VQ	dry wgt	TOC-norm	VQ
CHEMICAL NAME	Units	SL	BT	ML	Units	SQS	CSL	DMMU	SMS		DMMU	SMS	
Antimony	mg/kg	150		200		--	--	0.5		u	0.5		u
Arsenic	mg/kg	57	507.1	700	mg/kg	57	93	**2.8**	**2.8**		**3.1**	**3.1**	
Cadmium	mg/kg	5	11.3	14	mg/kg	5.1	6.7	**0.5**	**0.5**		0.5	0.5	u
Chromium	mg/kg	(2)	267	(2)	mg/kg	260	270	**NA**	**NA**		**NA**	**NA**	
Copper	mg/kg	390	1,027	1,300	mg/kg	390	390	**12**	**12**		**15**	**15**	
Lead	mg/kg	450	975	1,200	mg/kg	450	530	5	5	u	5	5	u
Mercury	mg/kg	0.41	1.5	2.3	mg/kg	0.41	0.59	0.1	0.1	u	0.1	0.1	u
Nickel	mg/kg	140	370	370	mg/kg	--	--	**37**			**31**		
Selenium	mg/kg	(2)	3	(2)	mg/kg	--	--	**NA**			**NA**		
Silver	mg/kg	6.1	6.1	8.4	mg/kg	6.1	6.1	1	1	u	1	1	u
Zinc	mg/kg	410	2,783	3,800	mg/kg	410	960	**38**	**38**		**47**	**47**	
Tributyltin (porewater)	ug/L	0.15	0.15		ug/L	0.05	0.35	**NA**			**NA**		
Naphthalene	ug/kg	2,100		2,400	mg/kg-OC	99	170	24		u	33		u
Acenaphthylene	ug/kg	560		1,300	mg/kg-OC	66	66	12		u	17		u
Acenaphthene	ug/kg	500		2,000	mg/kg-OC	16	57	12		u	17		u
Fluorene	ug/kg	540		3,600	mg/kg-OC	23	79	12		u	17		u
Phenanthrene	ug/kg	1,500		21,000	mg/kg-OC	100	480	**17**			**20**		
Anthracene	ug/kg	960		13,000	mg/kg-OC	220	1,200	12		u	17		u
2-Methylnapthalene	ug/kg	670		1,900	mg/kg-OC	--	--	12		u	17		u
Total LPAH	ug/kg	5,200		29,000	mg/kg-OC	370	780	**17**			**20**		
Fluoranthene	ug/kg	1,700	4,600	30,000	mg/kg-OC	160	1,200	**34**			**53**		
Pyrene	ug/kg	2,600	11,980	16,000	mg/kg-OC	1,000	1,400	**29**			**39**		
Benzo(a)anthracene	ug/kg	1,300		5,100	mg/kg-OC	110	270	12		u	**34**		
Chrysene	ug/kg	1,400		21,000	mg/kg-OC	110	460	12		u	**33**		
Benzofluoranthenes (b+k)	ug/kg	3,200		9,900	mg/kg-OC	230	450	24		u	45		T
Benzo(a)pyrene	ug/kg	1,600		3,600	mg/kg-OC	99	210	24		u	33		u
Indeno(1,2,3-cd)pyrene	ug/kg	600		4,400	mg/kg-OC	34	88	24		u	33		u
Dibenzo(a,h)anthracene	ug/kg	230		1,900	mg/kg-OC	12	33	24		u	33		u
Benzo(g,h,I)perylene	ug/kg	670		3,200	mg/kg-OC	31	78	24		u	33		u
Total HPAH	ug/kg	12,000		69,000	mg/kg-OC	960	5,300	**63**			**159**		
1,3-Dichlorobenzene	ug/kg	170		--	mg/kg-OC	--	--	12		u	17		u
1,4-Dichlorobenzene	ug/kg	110		120	mg/kg-OC	3	9	12		u	17		u
1,2-Dichlorobenzene	ug/kg	35		110	mg/kg-OC	2.3	2.3	12		u	17		u
1,2,4-Trichlorobenzene	ug/kg	31		64	mg/kg-OC	0.81	1.8	12		u	17		u
Hexachlorobenzne (HCB)	ug/kg	22	168	230	mg/kg-OC	0.38	2.3	24		u	33		u
Dimethylphthalate	ug/kg	1,400		--	mg/kg-OC	53	53	12		u	17		u
Diethylphthalate	ug/kg	1,200		--	mg/kg-OC	61	110	12		u	17		u
Di-n-butylphthalate	ug/kg	5,100		--	mg/kg-OC	220	1,700	12		u	17		u
Butylbenzylphthalate	ug/kg	970		--	mg/kg-OC	4.9	64	12		u	17		u
Bis(2-ethylhexyl)phthalate	ug/kg	8,300		--	mg/kg-OC	47	78	**39**			**27**		
Di-n-octylphthalate	ug/kg	6,200		--	mg/kg-OC	58	4,500	12		u	17		u
Phenol	ug/kg	420		1,200	ug/kg	420	1,200	12	12	u	**1060**	**1060**	
2-Methylphenol	ug/kg	63		77	ug/kg	63	63	12	12	u	17	17	u
4-Methylphenol	ug/kg	670		3,600	ug/kg	670	670	12	12	u	**280**	**280**	
2,4-Dimethylphenol	ug/kg	29		210	ug/kg	29	29	12	12	u	17	17	u
Pentachlorophenol	ug/kg	400	504	690	ug/kg	360	690	120	120	u	170	170	u
Benzyl alcohol	ug/kg	57		870	ug/kg	57	73	12	12	u	17	17	u
Benzoic acid	ug/kg	650		760	ug/kg	650	650	300	300	u	**535**	**535**	
Dibenzofuran	ug/kg	540		1,700	mg/kg-OC	15	58	12		u	17		u
Hexachloroethane	ug/kg	1,400		14,000	mg/kg-OC			24		u	33		u
Hexachlorobutadiene	ug/kg	29		270	mg/kg-OC	3.9	6.2	12		u	17		u
N-Nitrosodiphenylamine	ug/kg	28		130	mg/kg-OC	11	11	12		u	17		u
Trichloroethene	ug/kg	160		1,600	ug/kg	--	--	2		u	2		u
Tetrachloroethene	ug/kg	57		210	ug/kg	--	--	2		u	2		u
Ethylbenzene	ug/kg	10		50	ug/kg	--	--	2		u	2		u
Total Zylene (sum of o-,m-,p-)	ug/kg	40		160	ug/kg	--	--	2		u	2		u
Total DDT (sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT)	ug/kg	6.9	50	69	mg/kg-OC	--	--	2		u	3		u
Aldrin	ug/kg	10			mg/kg-OC	--	--	1		u	2		u
Chlordane	ug/kg	10	37		mg/kg-OC	--	--	**NA**			**NA**		
Dieldrin	ug/kg	10			mg/kg-OC	--	--	2		u	3		u
Heptachlor	ug/kg	10			mg/kg-OC	--	--	1		u	2		u
Alpha-BHC	ug/kg	NA	10		mg/kg-OC	--	--	12		u	16		u
Gamma-BHC (Lindane)	ug/kg	10			mg/kg-OC	--	--	1		u	2		u
Total PCBs	ug/kg	130	38***	3,100	mg/kg-OC	12	65	24		u	33		u

Table 2. Keystone Ferry Terminal Sediment Characterization Summary for Beach Nourishment (1988)

								C-1 (West)*			C-2 (East)*		
	DMMP				SMS			dry wgt	TOC-norm	VQ	dry wgt	TOC-norm	VQ
CHEMICAL NAME	Units	SL	BT	ML	Units	SQS	CSL	DMMU	SMS		DMMU	SMS	
Total Solids	%							82.5			84.3		
Total Volatile Solids	%							1.2			1.2		
Total Organic Carbon	%							0.2			0.2		
Total Ammonia	mg/kg							4.4			19		
Total Sulfides	mg/kg							<0.001			0.002		
Gravel	%							0			0		
Sand	%							97.5			97.6		
Silt	%							1.6			1.6		
Clay	%							0.9			0.8		
Fines (percent silt + clay)	%							2.5			2.4		
Eohaustorius estuarius hits:								NA			NA		
Mytilus galloprovincialis hits:								NA			NA		
Neanthes arenaceodentata hits:								NA			NA		
Bioassay Determination: (P/F)								NA			NA		
BTs exceeded:								NO			NO		
Bioaccumulation conducted:								NO			NO		
Bioaccumulation Determination:													
ML Rule exceeded:								NO			NO		
PSDDA Beneficial Use Determination:								PASS			PASS (bpj)		
DMMU Volume:	cy												
Rank								L			L		
Mean vibracorer sampling depth	ft							2.75			3		
Maximum vibracorer sampling depth (mudline)	ft							3			3		
DMMU ID:								C-1 (West)			C-2 (East)		

Legend:

SL/SQS = Screening Level/Sediment Quality Standards exceedance

P = Pass (Suitable for Beneficial Use)

VQ = Validation Qualifier

U = Undetected at the method detection limit

J = Estimate

T = Sum of the flagged analyte due to chromatographic co-elution

* = because of low TOC's (<0.5 %) dry weight SQS/CSL Criteria were utilized and not TOC normalized values