Prepared by:
Dredged Material Management Office
Seattle District, US Army Corps of Engineers

Memorandum for Record **August 12, 2021**

Subject: Suitability Determination Memorandum and Antidegradation Assessment for the Port of Everett North Marina Maintenance Dredging, in Everett, Washington (NWS-2021-528) for placement at the Port Gardner non-dispersive disposal site.

Introduction

This suitability determination memorandum (SDM) and antidegradation assessment documents the consensus regarding the suitability of the proposed dredged material for unconfined aquatic disposal and compliance of the post-dredge leave surface as determined by the Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers [USACE], Washington Departments of Ecology [Ecology] and Natural Resources [DNR], and the U.S. Environmental Protection Agency [EPA]).

Project Description

The Port of Everett's North Marina (also known as 12th Street Marina) is in Everett, Washington, adjacent to the Snohomish River, and is part of a complex that also includes the Port's South and Central Marinas (Figure 1). The North Marina, like the others, is subject to shoaling due to the deposition of sediment from the Snohomish River. The marina was built in 2005 and has neither been characterized nor dredged since construction. This marina requires maintenance dredging to allow for safe navigation within the public marina and to prevent damage to existing marina infrastructure.

Project Summary

Waterbody	Mouth of the Snohomish River at Possession Sound
Water classification	Estuarine
Project rank	Low-moderate
Total proposed dredging volume	~88,259 cubic yards (cy)
Target proposed dredging depth	-14 ft MLLW
Max. proposed dredging depth (includes 2 feet overdepth allowance)	-16 ft MLLW
Proposed disposal location(s)	Port Gardner non-dispersive disposal site
Dredged Material Management Units (DMMUs); No. of stations	3 surface DMMUs and 2 subsurface DMMUs; 10 cores
Sampling method	vibracorer
DMMO tracking number	POENM21-1-A-F-432
EIM Study ID	POENM21
USACE Regulatory Reference Number	NWS-2021-528
Sampling and Analysis Plan (SAP) Approval Date	February 18, 2021 (Windward 2021a)
Sampling Date(s)	February 23 - 24, 2021
Testing Parameters	DMMP Marine COCs plus tributyltin and dioxins/furans (D/Fs)
Biological Testing	Not required
Suitability Outcome	All material found suitable for in-water disposal
Recency Expiration Date (low-moderate = 6 years)	February 2027
Antidegradation Assessment	In compliance

Sampling Design Considerations

Previous characterization and permitting has been only for the North Marina basin portion of this project, represented by DMMUs 1 and 2 (surface) and DMMU 3 (subsurface). The North Marina Entrance has never been either characterized or dredged and will be permitted separately; this portion of the dredge prism is represented by DMMU 4 (surface) and DMMU 5 (subsurface). Both portions of the project were ranked low-moderate, consistent with previous data from the North Marina area and nearby navigation channel.

DMMP sampling guidelines for low-moderate heterogenous dredge prisms require a maximum of 32,000 cy per surface DMMU and 48,000 cy per subsurface DMMU. Each DMMU is a composite of separate samples, each representing no more than 8,000 cy per sample. Surface DMMUs include the top four feet of a dredge prism; deeper material can be included in a subsurface DMMU. Based on these guidelines, the proposed dredge volume of approximately 88,259 cy was divided into three surface DMMUs (1, 2 and 4) and two subsurface DMMUs (3 and 5).

Sampling and Analysis Description

Sampling was conducted on February 23-24, 2021 using a vibracorer aboard the *R/V Tieton*, operated by the subcontractor Gravity Marine Services. DGPS was used to provide accurate horizontal positioning. Vertical positioning was conducted using predicted tide measurements from National Oceanic and Atmospheric Administration (NOAA) tide Station ID 9447659 and lead line measurements taken from the bow of the sampling vessel.

Ten cores were collected as shown in Figure 2 and detailed in Tables 1 and 2. Most of the accepted cores met all acceptability criteria; one core (at location S4-01) was accepted with less than 75% recovery and was not able to core into the proposed Z-layer. After several attempts, which were complicated by woody debris in the dredge prism, the core with the highest recovery and deepest penetration was deemed acceptable. All accepted cores were composited per the approved SAP (Table 1) and analyzed for the DMMP chemicals of concern plus tributyltin and Dioxins/Furans. All analyses were conducted by Analytical Resources Incorporated in Tukwila, Washington.

Data Validation

A data quality assurance/quality control review comparable to an EPA Stage 2a data validation was performed by Laboratory Data Consultants, Inc. in Carlsbad, CA. Based on the information reviewed, the overall data quality was considered acceptable for all uses, as qualified. No data were rejected. The results summary (Table 3) includes qualifiers as assigned in the validation report, not necessarily as originally qualified in the lab results.

Analytical Testing Results

As summarized in Table 3, analytical results from all five DMMUs fell below DMMP Screening Level guidelines, except for one exceedance (80.3 ug/kg dry wt) of benzyl alcohol in DMMU 4. Although this level exceeded the DMMP screening level of 57 ug/kg dry wt., it was the sole detected or undetected exceedance, and came from a sample with documented plant material in the sediment sample. The DMMP did not require biological toxicity testing for DMMU 4, as DMMP guidelines allows case-by-case judgment for exceedances of benzyl alcohol in sediments that have no other indications of toxicity (DMMP 2016).

Surface sediments within the marina (DMMUs 1, 2 & 4) showed somewhat higher fine grain sizes (66.7% to 76.9%) than did the subsurface sediments in DMMUs 3 and 5 (53.4% and 45.2% respectively). Total organic carbon (TOC) was highest in DMMU 4 (3.79%) – unsurprising given the plant material found in that composite.

Dioxins/furans and Tributyltin. D/F and tributyltin analyses were performed because they are chemicals of concern in portions of the Port of Everett area. The D/F concentration found in the sample composites ranged from 0.9 to 1.9 ng/kg-TEQ, all below the 4 ng/kg-TEQ guideline. D/F results and TEQ calculations are broken down in Table 4. The concentration of tributyltin was undetected in all samples at levels (~3.9 ug/kg), well below the 74 ug/kg Bioaccumulation Trigger (BT).

DMMP Determinations

Project Footprint Modification

Subsequent to the sampling event for this project, the Port of Everett requested that the boundaries for the proposed dredging footprint in the North Marina be modified (Figure 3). They did not request a change in the proposed volume, noting that their original volume calculations were conservatively calculated. Per DMMP request, the Port provided a "Tier 1" evaluation of the footprint extension, in order to assist the DMMP in determining whether the completed sampling was sufficient to cover the extended footprint (Windward 2021b). The memo documented that the additional area included sediment from the same source as the original proposed footprint, and was subject to similar uses and potential sources. Given this information, and the fact that no increase in volume was proposed, the DMMP concluded that the completed characterization can represent the revised footprint. No additional sampling or information is needed.

Suitability Determination

Chemical concentrations in the dredge prism composite samples were below the DMMP marine SLs and BTs as discussed above. Samples were collected per DMMP guidelines and all data were considered acceptable as qualified.

The DMMP agencies have concluded that all characterized material from the Port of Everett North Marina is suitable for in-water disposal at the Port Gardner DMMP disposal site. If there are no significant changes to the project scope or new contaminant sources identified, material from this project will be considered suitable through the recency period ending in February 2027.

Antidegradation Determination

The sediment to be exposed by dredging must either meet the State of Washington Sediment Management Standards (SMS) or the State's Antidegradation Standard (Ecology 2013) as outlined by DMMP guidance (DMMP 2008). Concentrations of all DMMP chemicals of concern were below the DMMP SLs, and there is no reason to believe that a new exposed surface would be contaminated relative to the overlying materials; therefore, this project complies with the State of Washington Antidegradation Standard.

Debris Management

The DMMP agencies implemented a debris screening requirement following the 2015 SMARM to prevent the disposal of solid waste and debris at open-water disposal sites in Puget Sound (DMMP, 2015). Per these guidelines, a screening grid should be used for this project to remove potential debris not allowed at DMMP disposal sites. Alternate debris management plans may be submitted to the

DMMP prior to dredging if it can be demonstrated that debris is unlikely to be present or that other removal options are sufficient.

Notes and Clarifications

The decisions documented in this memorandum do ***not*** constitute final agency approval of the project. During the public comment period that follows a public notice, 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, Ecology and the Corps of Engineers is required at least 7 days prior to dredging. A dredging quality control plan must be developed and submitted to the USACE Seattle District's Regulatory Branch and Ecology. Refer to the USACE permit and Ecology 401 certification for project-specific submittal requirements and timelines.

The DMMP does not make specific beneficial use determinations. However, these data are available for the assessment of project-specific beneficial use by the project proponent, permitting agencies, local health jurisdictions and/or the owner of a receiving property.

Projects proposing to use one of the DMMP open-water disposal sites must submit their application for a Site Use Authorization (SUA) to the Washington State Department of Natural Resources (DNR) at least 4 weeks prior to dredging. Applications submitted less than 4 weeks prior to dredging may be subject to delays.

References

DMMP 2008. *Quality of Post-Dredge Sediment Surfaces (Updated).* A Clarification Paper Prepared by David Fox (USACE), Erika Hoffman (EPA) and Tom Gries (Ecology) for the Dredged Material Management Program, June 2008.

DMMP 2016. *Revised Evaluation Guidelines for Benzyl Alcohol in Marine Sediments.* Prepared by Heather Whitney Fourie (U.S. Army Corps of Engineers) and David Fox (U.S. Army Corps of Engineers) for the DMMP agencies. Final DMMP Clarification Paper, June 6, 2016.

DMMP 2018. *Dredged Material Evaluation and Disposal Procedures (User Manual)*. Dredged Material Management Program, updated December 2018.

Ecology 2013. *Sediment Management Standards – Chapter 173-204 WAC*. Washington State Department of Ecology, February 2013.

Windward Environmental (Windward) 2021a. Port of Everett North Marina – Sediment Characterization Sampling and Analysis Plan. Final. Prepared for Port of Everett, February 19, 2021.

Windward 2021b. *Revised boundaries for DMMU 1 and DMMU 2 in the Port of Everett's North Marina.* Memorandum to the DMMP agencies on behalf of the Port of Everett, July 8, 2021.

Windward 2021c. Port of Everett North Marina – Sediment Characterization Data Report. Prepared for Port of Everett, July 9, 2021.

Agency Signatures

August 12, 2021 — Lauran Cole Warner
Date — Lauran Warner – U.S. Army Corps of Engineers, Seattle District

08/12/2021 — Erika Hoffman
Date — Erika Hoffman – U.S. Environmental Protection Agency, Region 10

08/12/2021 — Laura Inouye
Date — Laura Inouye, PhD. – Washington State Department of Ecology

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Date — Shannon Soto – Washington State Department of Natural Resources

Copies Furnished:
DMMP agencies
USACE Regulatory Project Manager
DMMO File

Figure 1. Port of Everett North Marina Vicinity

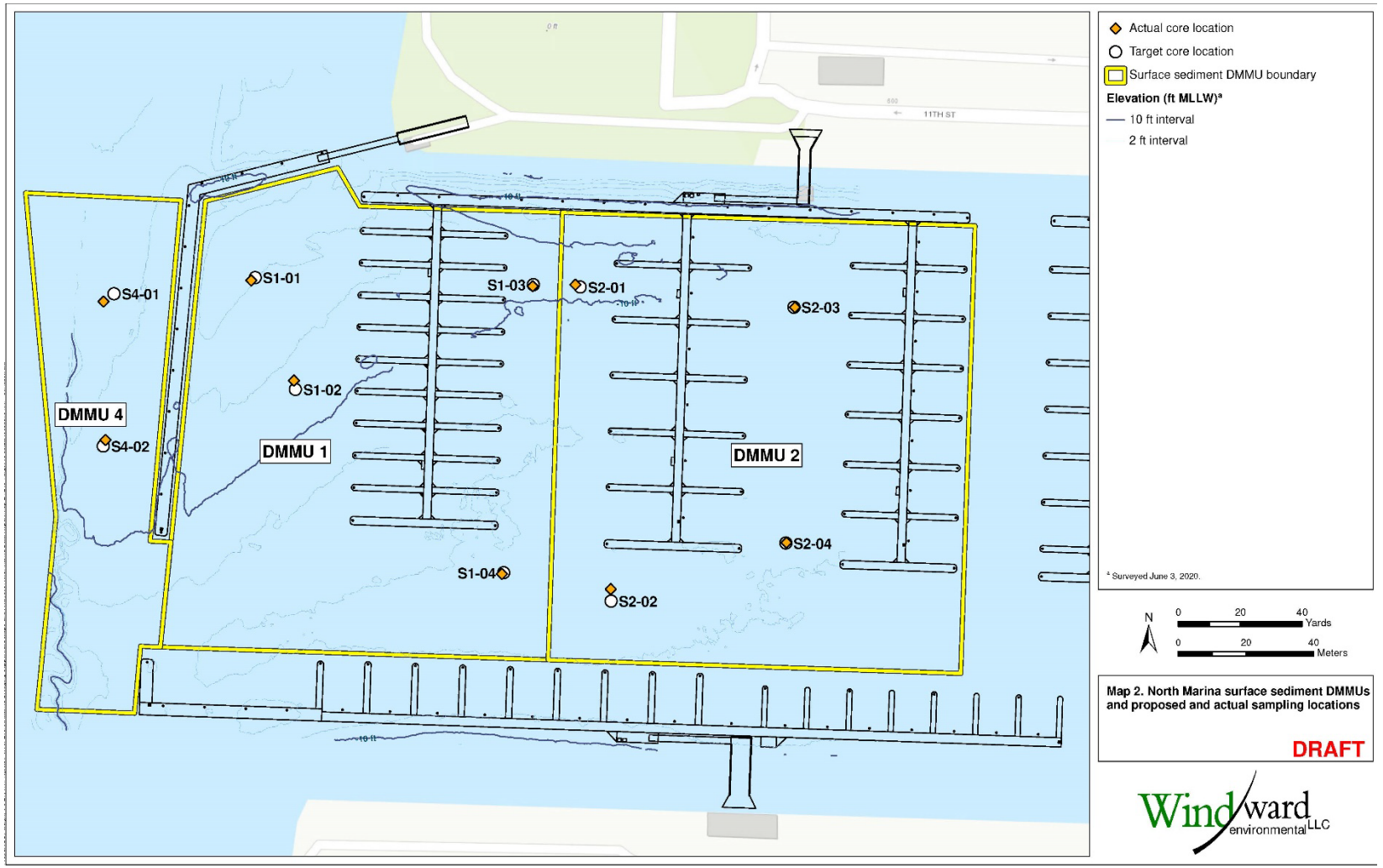

Figure 2. Port of Everett North Marina DMMUs with proposed and actual sample locations

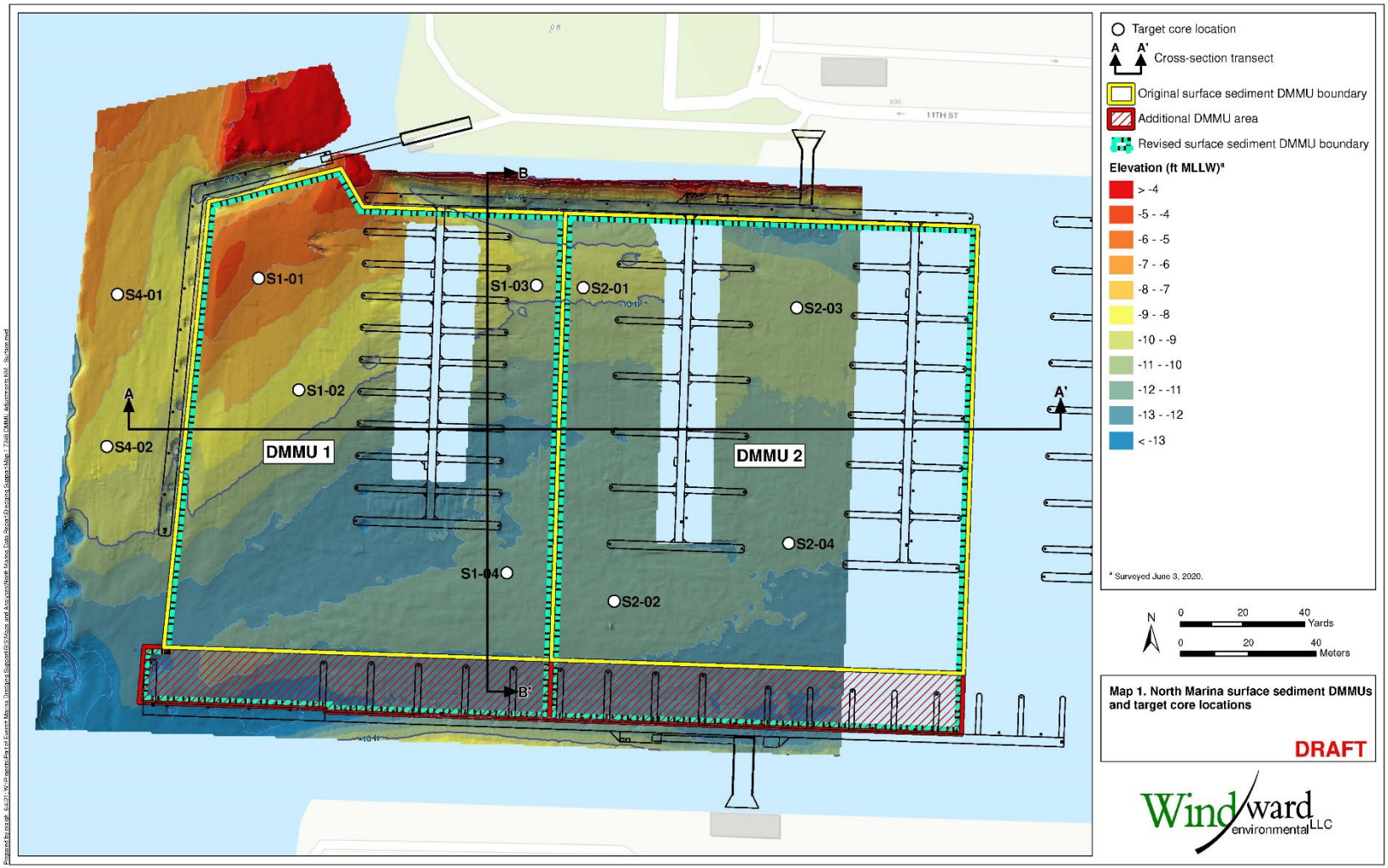

Figure 3. Port of Everett North Marina post-sampling footprint revision with DMMUs and sample locations

Table 1. DMMU sampling and compositing scheme

	DMMU	Estimated Dredge Volume (CY)	No. of Core Samples	Estimated Dredge Volume per Core (CY)	Core ID	Sediment Elevation (ft MLLW)
Surface	1	27,860	4	6,965	S1-01	-5.33 to -9.33
					S1-02	-7.81 to -11.81
					S1-03	-9.49 to -13.49
					S1-04	-11.41 to -16.0
	2	31,590	4	7,898	S2-01	-8.47 to -16.0
					S2-02	-10.73 to -16.0
					S2-03	-9.83 to -16.0
					S2-04	-10.96 to -16.0
	4	12,227	2	6,113	S4-01	-6.55 to -10.55
					S4-02	-7.82 to -11.82
Subsurface	3	13,090	3	4,363	S1-01	-9.33 to -16.0
					S1-02	-11.81 to -16.0
					S1-03	-13.49 to -16.0
	5	3,492	2	1,746	S4-01	-10.55 to -16.0
					S4-02	-11.82 to -16.0

Table 2. Sample target and actual coordinates, penetration, and recovery depths (adapted from Windward 2021b)

Core ID	Target		Actual		Distance from Target (ft)	Water Depth[b] (ft)	Tide Elevation[c] (ft)	Estimated Mudline Elevation (ft MLLW)	Penetration Depth (ft)	Core Recovery Depth (ft)	Recovery (%)
	Latitude[a]	Longitude[a]	Latitude[a]	Longitude[a]							
S1-01	48.002969	-122.223242	48.002961	-122.223258	4.7	13.53	-8.20	-5.33	13.7	13.5	98.5
S1-02	48.002674	-122.223075	48.002698	-122.223081	8.8	17.30	-9.49	-7.81	11.3	10.3	91.1
S1-03	48.002963	-122.222141	48.002959	-122.222144	1.6	16.9	-7.41	-9.49	10.0	9.5	95.0
S1-04	48.002199	-122.222238	48.002196	-122.222245	2.1	17.2	-5.29	-11.41	9.5	9.5	100
S2-01	48.002959	-122.221955	48.002966	-122.221974	5.3	18.2	-9.73	-8.47	10.0	10.0	100
S2-02	48.002129	-122.221810	48.002161	-122.221813	11.5	20.0	-9.27	-10.73	9.5	9.5	100
S2-03	48.002916	-122.221108	48.002916	-122.221104	0.9	17.7	-7.87	-9.83	10.0	9.7	97.0
S2-04	48.002291	-122.221123	48.002293	-122.221120	0.8	17.8	-6.84	-10.96	8.5	7.5	88.2
S4-01	48.002919	-122.223800	48.002898	-122.223841	12.7	14.3	-7.75	-6.55	13.0	9.5	73.1
S4-02	48.002515	-122.223831	48.002531	-122.223823	6.3	16.8	-8.98	-7.82	13.0	10.4	80.0

[a] NAD83 geographic coordinates – decimal degrees.

[b] Water depth was measured using a leadline.

[c] Tide elevations from NOAA's predictions for Everett tide station No. 9447659.

MLLW – mean lower low water

NAD83 – North American Datum of 1983

Table 3. Chemistry results for DMMU composite samples compared to DMMP guidelines

	DMMP Marine Guidelines			DMMU 1		DMMU 2		DMMU 3		DMMU 4		DMMU 5	
	SL	BT	ML	Surface		Surface		Subsurface		Surface		Subsurface	
CONVENTIONALS (% dry weight)													
Total gravel				0.1		0.5		0.9		1.7		1.2	
Total sand				25.5		22.5		45.5		31.2		53.4	
Total silt				68.1		69.8		49.1		62.8		39.5	
Total clay				6.1		7.1		4.3		3.9		5.7	
Total Fines (silt + clay)				74.2		76.9		53.4		66.7		45.2	
Total organic carbon (TOC)				1.84		1.62		1.67		3.79		2.28	
Total solids				57.08		58.19		62.95		50.81		60.14	
METALS (mg/kg dry weight)													
Antimony	150	---	200	0.03	UJ	0.34	UJ	0.31	UJ	0.04	UJ	0.31	UJ
Arsenic	57	507.1	700	11.1		11.2		11.1		15		11.9	
Cadmium	5.1	--	14	0.27		0.28		0.19		0.21		0.19	
Chromium	260	--	---	44.7		45.7		41.2		44		40.6	
Copper	390	--	1,300	51.1		49.4		40.7		49.9		42.3	
Lead	450	975	1,200	10.3		10.9		8.9		10.6		8.97	
Mercury	0.41	1.5	2.3	0.0858		0.0853		0.0626		0.0719		0.059	
Selenium	--	3	--	1.19		1.21		1.06		1.27		1.06	
Silver	6.1	--	8.4	0.15	J	0.16	J	0.11	J	0.13	J	0.11	J
Zinc	410	--	3,800	75		77.3		67.5		72.3		66.3	
ORGANOMETALLICS (µg/kg dry weight)													
Tributyltin as ion	---	73	---	3.85	U	3.85	U	3.86	U	3.85	U	3.85	U
PAHs (µg/kg dry weight)													
2-Methylnaphthalene	670	---	1,900	11.9	J	10.2	J	17	J	6.5	J	20.5	
Total LPAHs	5,200	---	29,000	92.6	J	87.4	J	172.2	J	92.8	J	163.8	J
Acenaphthene	500	---	2,000	6.2	J	5.4	J	10.3	J	7.7	J	16.3	J
Acenaphthylene	560	---	1,300	20	U	5.5	J	8.4	J	5.1	J	5.3	J
Anthracene	960	---	13,000	12.7	J	10.7	J	16	J	18.8	J	15.6	J
Fluorene	540	---	3,600	11.9	J	7	J	13.9	J	10.7	J	18	J
Naphthalene	2,100	---	2,400	28.2		32.9		57.8		23		62.9	
Phenanthrene	1,500	---	21,000	33.6		25.9		65.8		27.5		45.7	
Total HPAHs	12,000	---	69,000	213.8	J	187.2	J	272.5	J	188.6	J	216.7	J
Benzo(a)anthracene	1,300	---	5,100	18.7	J	16.5	J	18.5	J	14.1	J	18.5	J
Benzo(a)pyrene	1,600	---	3,600	20	U	16.3	J	20	U	17.2	J	15	J

	DMMP Marine Guidelines			DMMU 1		DMMU 2		DMMU 3		DMMU 4		DMMU 5	
	SL	BT	ML	Surface		Surface		Subsurface		Surface		Subsurface	
Benzo(g,h,i)perylene	670	---	3,200	14	J	11.4	J	13.1	J	19.9	U	13.6	J
Benzofluoranthenes (b, j, k)	3,200	---	9,900	45.6		37.6	J	42.1		55.2		35.7	J
Chrysene	1,400	---	21,000	29.3		31.1		32.9		26.3		26.1	
Dibenzo(a,h)anthracene	230	---	1,900	20	U	19.9	U	20	U	19.9	U	19.9	U
Fluoranthene	1,700	4,600	30,000	42.6		26.9		77.7		33.6		50.9	
Indeno(1,2,3-cd)pyrene	600	---	4,400	10.9	J	8.9	J	10	J	10.7	J	11	J
Pyrene	2,600	11,980	16,000	52.7		38.5		78.2		31.5		45.9	
PHTHALATES (µg/kg dry weight													
Bis(2-ethylhexyl)phthalate	1,300	---	8,300	36.1	J	244		49.9	U	70.4		49.8	U
Butyl benzyl phthalate	63	---	970	5	U	5	U	9.5		5	U	5	U
Diethyl phthalate	200	---	1,200	30.5	U	80.2	U	35	U	39.3	U	82.7	U
Dimethyl phthalate	71	---	1,400	20	U	19.9	U	20	U	19.9	U	19.9	U
Di-n-butyl phthalate	1,400	---	5,100	20	U	19.9	U	20	U	19.9	U	19.9	U
Di-n-octyl phthalate	6,200	---	6,200	20	U	19.9	U	20	U	19.9	U	19.9	U
Other SVOCs (µg/kg dry weight)													
1,2,4-Trichlorobenzene	31	---	64	5	U	5	U	5	U	5	U	5	U
1,2-Dichlorobenzene	35	---	110	5	U	5	U	5	U	5	U	5	U
1,4-Dichlorobenzene	110	---	120	5	U	0.9	U	5	U	5	U	5	U
2,4-Dimethylphenol	29	---	210	20	U	19.9	U	2.8	J	19.9	U	19.9	U
2-Methylphenol	63	---	77	20	U	19.9	U	20	U	19.9	U	19.9	U
4-Methylphenol	670	---	3,600	21.1		20		34.8		78.8		49.9	
Benzoic acid	650	---	760	200	U	199	U	200	U	137	J	105	J
Benzyl alcohol	57	---	870	20.6		21.3		20	U	80.3		46.5	
Dibenzofuran	540	---	1,700	10.2	J	6.7	J	9.9	J	4.9	J	10.6	J
Hexachlorobenzene	22	168	230	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Hexachlorobutadiene	11	---	270	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
n-Nitrosodiphenylamine	28	---	130	20	U	19.9	U	20	U	19.9	U	19.9	U
Pentachlorophenol	400	504	690	99.9	U	99.7	U	99.8	U	99.3	U	99.7	U
Phenol	420	---	1,200	58.6		69.4		42.1		17.9	J	14.2	J
PCBs													
Total PCB Aroclors (µg/kg dry weight)	130	---	3,100	19.9	U	19.7	UJ	19.9	U	19.8	U	19.7	U
Total PCB Aroclors (mg/kg OC)	---	38	---	1.08	U	1.22	UJ	1.19	U	0.52	U	0.86	U

	DMMP Marine Guidelines			DMMU 1		DMMU 2		DMMU 3		DMMU 4		DMMU 5	
	SL	BT	ML	Surface		Surface		Subsurface		Surface		Subsurface	
PESTICIDES													
4,4'-DDD	16	---	---	1	U	1	U	1	U	1	U	1	U
4,4'-DDE	9	---	---	1	U	1	U	1	U	1	U	1	U
4,4'-DDT	12	---	---	1	U	1	U	1	U	1	U	1	U
Total DDTs	---	50	69	1	U	1	U	1	U	1	U	1	U
Aldrin	9.5	---	---	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Total Chlordane	2.8	37	---	1	U	1	U	1	U	1	U	1	U
Dieldrin	1.9	---	1,700	1	U	1	U	1	U	1	U	1	U
Heptachlor	1.5	---	270	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
DIOXINS/FURANS													
Dioxin/furan TEQ - mammal (half DL)	4	10	---	1.85	J	1.38	J	1.64	J	1.88	J	0.898	J

Notes:
DMMP – Dredged Material Management Program
DMMU – dredged material management unit

SL – screening level
BT – bioaccumulation trigger
ML – maximum level

LPAH – low-molecular-weight polycyclic aromatic hydrocarbon nc – no criterion
HPAH – high-molecular-weight polycyclic aromatic hydrocarbon
SVOC – semivolatile organic compound
TEQ – toxic equivalent
OC – organic carbon

J – estimated concentration
U – result undetected at reporting limit shown
UJ – result undetected at the estimated reporting limit shown

Table 4. Dioxin/furan TEQ results calculated with both non-detect = 1/2 reporting limit, and non-detect = 0

		ND=1/2 RL TEQ					ND=0 TEQ				
Chemical	**TEF[1]**	**DMMU 1**	**DMMU 2**	**DMMU 3**	**DMMU 4**	**DMMU 5**	**DMMU 1**	**DMMU 2**	**DMMU 3**	**DMMU 4**	**DMMU 5**
2,3,7,8-TCDD	1	0.121	0.095	0.041	0.104	0.044	0.000	0.000	0.000	0.000	0.000
1,2,3,7,8-PeCDD	1	0.604	0.221	0.550	0.380	0.079	0.604	0.000	0.550	0.380	0.000
1,2,3,4,7,8-HxCDD	0.1	0.051	0.037	0.049	0.018	0.016	0.051	0.037	0.049	0.000	0.000
1,2,3,6,7,8-HxCDD	0.1	0.164	0.150	0.136	0.124	0.106	0.164	0.150	0.136	0.124	0.106
1,2,3,7,8,9-HxCDD	0.1	0.118	0.092	0.097	0.074	0.096	0.118	0.092	0.097	0.074	0.096
1,2,3,4,6,7,8-HpCDD	0.01	0.360	0.406	0.289	0.305	0.239	0.360	0.406	0.289	0.305	0.239
OCDD	0.0003	0.085	0.101	0.065	0.065	0.055	0.085	0.101	0.065	0.065	0.055
2,3,7,8-TCDF	0.1	0.047	0.094	0.133	0.179	0.090	0.000	0.094	0.133	0.179	0.090
1,2,3,7,8-PeCDF	0.03	0.010	0.003	0.009	0.041	0.003	0.010	0.000	0.009	0.041	0.000
2,3,4,7,8-PeCDF	0.3	0.105	0.045	0.098	0.372	0.039	0.105	0.000	0.098	0.372	0.000
1,2,3,4,7,8-HxCDF	0.1	0.039	0.043	0.041	0.051	0.032	0.039	0.043	0.041	0.051	0.032
1,2,3,6,7,8-HxCDF	0.1	0.022	0.033	0.030	0.039	0.025	0.000	0.033	0.030	0.039	0.025
1,2,3,7,8,9-HxCDF	0.1	0.005	0.004	0.007	0.010	0.004	0.000	0.000	0.000	0.000	0.000
2,3,4,6,7,8-HxCDF	0.1	0.048	0.003	0.038	0.024	0.024	0.048	0.000	0.038	0.000	0.000
1,2,3,4,6,7,8-HpCDF	0.01	0.063	0.053	0.047	0.074	0.044	0.063	0.053	0.047	0.074	0.044
1,2,3,4,7,8,9-HpCDF	0.01	0.003	0.002	0.003	0.005	0.001	0.003	0.000	0.003	0.005	0.000
OCDF	0.0003	0.004	0.004	0.003	0.012	0.002	0.004	0.004	0.003	0.012	0.002
Totals		**1.85**	**1.38**	**1.64**	**1.88**	**0.90**	**1.65**	**1.01**	**1.59**	**1.72**	**0.69**

Notes:
[1] TEFs used are from World Health Organization (WHO) 2005.
Values shaded in yellow are non-detects.