Memorandum for Record **July 24, 2023**

Subject: Suitability Determination Memorandum and Antidegradation Assessment for USACE Navigation Operations & Maintenance Dredging of the Lower Duwamish Waterway, Section B, Section A, and Turning Basin in Seattle, Washington.

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 and Natural Resources, and the U.S. Environmental Protection Agency (EPA)).

Project Description

The Lower Duwamish Waterway (LDW), including the federal navigation channel, has been on the EPA Superfund list since 2001. The upper reaches of the LDW (Section B [242+00 to 254+00], Section A [254+00 to 270+56], and Turning Basin [270+56 to 275+56]), shown on Figure 1, are upstream of the more contaminated areas of the LDW and serve as a settling basin for cleaner sediments coming from the Green River. USACE routinely dredges this portion of the LDW to minimize sediment flow downstream and to maintain navigational depths.

Based on historical dredge volumes and estimated sedimentation rates, USACE aims to perform O&M dredging every 2 years. The 2022 sediment characterization is representative of each dredging event within the recency period, each of which may have up to 140,000 cubic yards (cy) of sediment. It is anticipated that up to three dredging events will occur within this SDM recency period.

The authorized channel depth is -15 feet (ft) mean lower low water (MLLW). A two-foot over-dredge is allowed in all sections (-15 ft to -17 ft MLLW) [1].

Project Summary

Waterbody	Lower Duwamish Waterway
Water classification	Marine
Project rank	Section B: Re-rank from High to Moderate (see Rank and Recency Section) Section A: Moderate Turning Basin: Low-moderate
Total proposed dredging volume (cy)	~140,000 per event
Target proposed dredging depth	-15 ft MLLW
Max. proposed dredging depth (includes 2 feet overdepth)	-17 ft MLLW
Proposed disposal location(s)	Open-water disposal (Elliott Bay)
Dredged Material Management Units (DMMUs): No. of stations	8 DMMUs total Section B: 3 DMMUs with 2 stations each Section A: 3 DMMUs with 5 stations each

[1] The SDM from 2021 provides background information on a previous restriction to the Section B over-dredge allowance (DMMP, 2021a).

	Turning Basin: 2 DMMUs (one with 4 stations and one with 3 stations)
DMMO tracking number	DUWOM-1-A-F-448
EIM Study ID	DUWOM23
USACE Regulatory Reference Number	Not applicable
Sampling and Analysis Plan (SAP) Approval Date	November 14, 2022 (EcoAnalysts 2022)
Sampling Date(s)	November 19-22, 2022
Sediment Characterization Report Approval Date	July 11, 2023 (EcoAnalysts 2023)
Testing Parameters	DMMP Marine COCs plus dioxins/furans
Biological Testing	Bioassay testing not required
Suitability Outcome	All material found suitable for in-water disposal
Recency Expiration Date = 6 years (see Rank and Recency Section)	November 2028
Antidegradation Assessment	In compliance

Sampling and Analysis Description

Sampling was conducted over four days using a vibracorer aboard the research vessel Carolyn Dow, operated by the subcontractor Research Support Services. DGPS was used to provide accurate horizontal positioning. Vertical positioning was conducted using real-time tide measurements from National Oceanic and Atmospheric Administration (NOAA) tide Station ID 9447130 and lead line measurements taken from the bow of the sampling vessel. A few stations were moved a short distance (less than or equal to 65 feet) to avoid Muckleshoot Tribe fishing nets. Figures 2, 3, and 4 show the sediment sampling locations and Tables 1 and 2 list the core collection details.

Sediment is considered “homogenous” so only surface and Z samples were collected from each DMMU. All recovered core lengths were less than 5ft below mudline. To obtain adequate sediment volume for chemical analyses and potential bioassay analyses, 2 cores were collected and composited from each Section B station (DMMU’s 1 -3). Only one core per station was required for Section A and the Turning Basin.

Coring difficulties resulted in less than 75% recovery (%R) for many locations and, in some cases, no Z-sample intervals were collected in the upper part of Section A and the Turning Basin, where sediment is coarser. Several attempts were made at these stations but after a minimum of three attempts, the decision was made to use cores with less than 75% R for testing. In general, the core with the greatest %R was retained for sampling. There were some instances, in the Turning Basin, where the %R was so low that multiple cores were used to generate adequate volume for the required testing. Tables 3 and 4 provide detailed core collection and compositing information.

Cores were transported on the day of collection to the NewFields Edmonds, Washington office for processing. Eight surface DMMU samples were collected and analyzed for the DMMP chemicals of concern plus dioxin/furans (D/Fs). Individual station samples and Z-samples (where they could be collected) were retained in frozen archive. All analyses were conducted by ALS Environmental Laboratories in Kelso, Washington and Burlington, Ontario, Canada except for high resolution mass spectrometer (HRMS) pesticides which were analyzed at Pacific Rim Lab in British Columbia, Canada.

Data Validation

EcoChem conducted an EPA Stage 2B review and validation of all DMMP chemistry data and an EPA Stage 4 review of 10% of the D/F results. The validation process resulted in some additional J and UJ qualified data (estimated values) and U qualified data (EMPCs and analytes associated with method blank detections) beyond those assigned by the lab, based on specified protocol or technical advisory. There were also some rejected data as described below.

- The semi-volatile compound (SVOC) pentachlorophenol was rejected in seven of eight DMMU samples due to 0 %R of the laboratory control sample. DMMU-06 was used for the matrix spike/matrix spike duplicate (MS/MSD) sample and had sufficient MS/MSD % R's, to override the rejection. Due to the estimated time required for reanalysis (several months because of laboratory capacity issues) the DMMP conducted a comprehensive data review to decide if this compound was necessary to make a suitability determination. Because this compound is not a primary contaminant of concern for the LDW Superfund site, has not exceeded the DMMP screening level (SL) in previous characterizations, and the overall completeness goal of greater than 95% was met (99%), the DMMP determined that a suitability determination could be made without pentachlorophenol results in seven DMMUs.
- The initial sample extraction for HRMS pesticides occurred at days 50-53 which is grossly beyond the 14-day extraction hold times (when stored at 4°C). Furthermore, analysis for pesticides occurred at day 62 which is past the 40-day hold time after extraction. Because of this, the initial set of HRMS pesticide data was rejected. Frozen archive samples were sent to a separate lab (Pacific Rim Laboratories) for expedited HRMS pesticide analysis. Additionally, because of anomalous results for the initial analysis of DMMU-03, the individual samples that comprise the DMMU were each tested to confirm the sample composite results. All re-analyzed data was accepted and used for decision making.

Table 5 provides definitions of the various qualifiers used by the laboratory and data validator.

Analytical Testing Results

Tables 6 through 10 summarize the analytical results for the 8 DMMU surface composites alongside the DMMP marine guidelines (DMMP, 2021b). No results exceed SLs.

The physical characteristics of the navigation channel gradually change from primarily fines in Section B and the northern half of Section A, to a medium-coarse sand in the southern half of Section A and the Turning Basin. Total organic carbon (TOC) ranges from 2.6% to 0.8% and generally decreases from Section B to the Turning Basin.

Concentrations of chemicals correlate with TOC and generally decrease from Section B to the Turning Basin. PCBs were detected in all samples and ranged from 87 ug/kg (Section B) to 5 ug/kg (Turning Basin). Other chemicals were detected at low concentrations or were non-detect as has been observed in the last few characterizations.

Dioxins/furans. D/F analysis was performed because it is a chemical of concern in the LDW. The concentrations found in the surface DMMUs are consistent across sections and range from 0.5 to 1.1 ng/kg-TEQ, which is below the 4 ng/kg-TEQ guideline and therefore meets open-water disposal requirements.

DMMP Determinations

Rank and Recency

The different sections of the LDW navigation channel have different ranks due to data findings in previous sediment characterizations. Section B was ranked high due to a larval bioassay test failure in 2011. Over the last 10 years, dredging has been conducted more frequently in all sections, resulting in multiple sediment characterizations showing consistent chemical concentrations below screening levels.

According to the User Manual (DMMP, 2021b) a project site may be down-ranked after two consecutive characterizations indicate suitable material is present. Section B sediment has now been deemed suitable three times (2017, 2021, and 2023). The last two characterizations (2021 and 2023) included a two-foot over-dredge allowance. Based on the existing data, the DMMP agencies have approved a down-ranking of Section B from high to moderate.

In 2018, the DMMP agencies extended Section A's moderate recency to 6 years (standard recency for moderate is 5 years) to synchronize USACE's ESA consultation, permitting, and characterization requirements (DMMP, 2018). The recency for Section B will also be 6 years, consistent with Section A.

The current rank and recency of each segment is now as follows:

- Turning Basin: low-moderate; recency 6 years
- Section A: moderate; recency 6 years
- Section B: moderate; recency 6 years

Suitability Determination

Chemical concentrations in the dredge prism composite samples were below the DMMP marine SLs as discussed above. The characterization represented up to 140,000 cy of material in Section B, Section A, and the Turning Basin. The DMMP agencies have concluded that all of the characterized material is suitable for open-water disposal at the Elliott Bay non-dispersive disposal site. Removal of sediment within the characterized dredging prism is authorized until the recency expiration date of November 2028 as long as there are no significant changes to the project scope or new contaminant sources identified.

Dredging is anticipated to begin in the fall/winter of 2023, 2025, and 2027. The next sediment characterization would be conducted in 2027, unless there are changes to the project scope or new contaminant sources identified.

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 so Z-samples were not analyzed. Additionally, recent testing of the post-dredge surface (Section B) and Z-samples indicate that concentrations in the Z-layer are below SLs and SMS (DMMP, 2021a). For these reasons, the post-dredge surface is considered compliant with the State of Washington Antidegradation Standard.

Future Characterizations

The Turning Basin quickly fills in with sandy sediment which constitutes a large volume of the dredged material per dredging event. Collecting cores in predominantly sandy sediment is difficult. Due to the homogeneity of the Turning Basin shoal, the DMMP recommends collecting grab samples in this area, in lieu of cores. To provide better representation of the shoal, grab samples can be distributed across the entire shoal, including the coarse sand areas. Cores will still be collected in Sections A and B.

Debris Management

The DMMP agencies implemented a debris management requirement following the 2015 SMARM to prevent the disposal of debris (natural or anthropogenic) greater than 12 inches in any dimension at open-water disposal sites in Puget Sound. Debris screens are required unless it can be demonstrated that debris is unlikely to be present or that the debris is large woody debris that can be easily observed and removed by other means during dredging.

Because this area is dredged frequently (approximately every 2 years) and large woody debris has not been observed during recent dredging events, a debris screen is not required.

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.

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, 2011. Determination Regarding the Suitability of Federal Operation and Maintenance Dredged Material from the Duwamish River, Seattle, King County, Washington (Public Notice CENWS-OD-TS-NS-39) Evaluated under Section 404 of the Clean Water Act for Unconfined Open-Water Disposal at the Elliott Bay Nondispersive Site. Dredged Material Management Program, July, 2011.

DMMP, 2018. Determination Regarding the Suitability of Maintenance Dredged Material from the Duwamish River Navigation Channel Evaluated under Section 404 of the Clean Water Act for Unconfined Open-Water Disposal at the Elliott Bay Nondispersive Site. Dredged Material Management Program, May 24, 2018.

DMMP, 2021a. Suitability Determination Memorandum and Antidegradation Assessment for USACE Navigation Operations & Maintenance Dredging of the Lower Duwamish Waterway, Section B, in Seattle, Washington. Dredged Material Management Program, March 29, 2021

DMMP, 2021b. *Dredged Material Evaluation and Disposal Procedures (User Manual)*. Dredged Material Management Program, updated July 2021.

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

EcoAnalysts 2022. Sampling and Analysis Plan: Dredged Material Characterization, Duwamish Waterway Sections A and B and Turning Basin, Seattle, Washington. November 2022.

EcoAnalysts 2023. Dredged Material Characterization Report: Duwamish Waterway Sections A, B & Turning Basin, Seattle, Washington. July 2023.

Agency Signatures

The signed copy is on file in the Dredged Material Management Office, Seattle District U.S. Army Corps of Engineers

_____	_____
Date	Joy Dunay – U.S. Army Corps of Engineers, Seattle District
_____	_____
Date	Erika Hoffman – U.S. Environmental Protection Agency, Region 10
_____	_____
Date	Laura Inouye, PhD. – Washington State Department of Ecology
_____	_____
Date	Shannon Soto – Washington State Department of Natural Resources

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DMMO File

TABLES

Table 1. Actual Station Locations

DMMU	Sample ID	Core #	Date	Time	Latitude	Longitude	State Plane (X) Easting	State Plane (Y) Northing	Distance from Target
DMMU-01	DW22-SB-01-01	1 of 2	11/19/22	10:34	47.520164	-122.306961	1276313	193227	1.4
	DW22-SB-01-01	2 of 2	11/19/22	10:57	47.520149	-122.306946	1276317	193222	7.8
	DW22-SB-01-02	1 of 2	11/19/22	11:26	47.519646	-122.306953	1276313	193037	2.2
	DW22-SB-01-02	2 of 2	11/19/22	11:48	47.519665	-122.306953	1276312	193044	4.7
DMMU-02	DW22-SB-02-01	1 of 2	11/19/22	12:13	47.519470	-122.306511	1276421	192971	1.1
	DW22-SB-02-01	2 of 2	11/19/22	12:32	47.519474	-122.306488	1276427	192973	6.0
	DW22-SB-02-02	1 of 2	11/19/22	12:55	47.518681	-122.306320	1276463	192683	0.0
	DW22-SB-02-02	2 of 2	11/19/22	13:15	47.518669	-122.306320	1276463	192678	4.0
DMMU-03	DW22-SB-03-01	2 of 3	11/19/22	14:33	47.518326	-122.306114	1276510	192553	1.2
	DW22-SB-03-01	3 of 3	11/19/22	14:53	47.518341	-122.306122	1276509	192558	4.7
	DW22-SB-03-02	1 of 2	11/19/22	15:19	47.517601	-122.305855	1276570	192287	2.6
	DW22-SB-03-02	2 of 2	11/19/22	15:38	47.517616	-122.305847	1276571	192292	3.9
DMMU-04	DW22-SA-04-01	1 of 1	11/21/22	8:35	47.517342	-122.306053	1276520	192194	4.7
	DW22-SA-04-02	1 of 1	11/21/22	9:10	47.517052	-122.305542	1276643	192085	**46.2**
	DW22-SA-04-03	1 of 1	11/21/22	9:44	47.516548	-122.305542	1276639	191901	3.5
	DW22-SA-04-04	1 of 1	11/21/22	10:17	47.516254	-122.305489	1276650	191794	2.9
	DW22-SA-04-05	1 of 1	11/20/22	15:20	47.515976	-122.305382	1276676	191691	**41.1**
DMMU-05	DW22-SA-05-01	1 of 1	11/20/22	11:54	47.515701	-122.305283	1276698	191591	**64.8**
	DW22-SA-05-02	1 of 1	11/20/22	12:36	47.515564	-122.305092	1276745	191540	4.5
	DW22-SA-05-03	1 of 1	11/20/22	13:07	47.515209	-122.305275	1276697	191412	4.6
	DW22-SA-05-04	1 of 1	11/20/22	13:38	47.515041	-122.304840	1276802	191349	5.6
	DW22-SA-05-05	2 of 3	11/21/22	11:15	47.514683	-122.304924	1276778	191218	**32.3**
DMMU-06	DW22-SA-06-01	1 of 1	11/20/22	14:15	47.514511	-122.304581	1276863	191154	1.5
	DW22-SA-06-02	2 of 3	11/20/22	10:54	47.514290	-122.304939	1276773	191075	5.7
	DW22-SA-06-03	1 of 1	11/20/22	14:45	47.513729	-122.304230	1276944	190866	1.0
	DW22-SA-06-04	3 of 3	11/20/22	10:10	47.513466	-122.304520	1276870	190772	1.3
	DW22-SA-06-05	3 of 3	11/20/22	9:15	47.513119	-122.304298	1276924	190644	2.2

DMMU	Sample ID	Core #	Date	Time	Latitude	Longitude	State Plane (X) Easting	State Plane (Y) Northing	Distance from Target
DMMU-07	DW22-TB-07-01	1 of 2	11/22/22	9:32	47.512901	-122.303833	1277036	190563	5.4
	DW22-TB-07-02	3 of 3	11/22/22	15:06	47.512680	-122.303894	1277020	190482	**49.8**
	DW22-TB-07-03	1 of 1	11/22/22	10:27	47.512505	-122.303635	1277082	190417	4.6
	DW22-TB-07-04	1 of 4	11/22/22	11:05	47.512722	-122.303337	1277157	190495	5.0
	DW22-TB-07-04	3 of 4	11/22/22	11:49	47.512718	-122.303291	1277170	190493	7.6
	DW22-TB-07-04	4 of 4	11/22/22	12:22	47.512745	-122.303307	1277166	190504	6.9
DMMU-08	DW22-TB-08-01	2 of 3	11/21/22	15:06	47.512344	-122.302658	1277322	190354	**13.0**
	DW22-TB-08-02	2 of 2	11/22/22	14:07	47.512352	-122.303482	1277120	190362	8.2
	DW22-TB-08-03	1 of 1	11/22/22	13:20	47.512196	-122.303177	1277193	190302	4.3

Bold = more than 10 ft from target

Table 2. Sample Specific Information

DMMU	Sample ID	Core #	Date	Time	Water Depth	Observed Tide	MLLW	Target Core Length	Core Length (ft)	Penetration (ft)	% Recovery	Core Retained (ft)	Elevation Interval (ft MLLW)		Interval Below Mudline (ft)	
													Sample (MLLW to -17)	Z-sample (-17 to -19)	Sample	Z-sample
DMMU-01	DW22-SB-01-01	1 of 2	11/19/22	10:34	22.7	7.81	-14.9	4.1	4.2	4.5	93%	4.1	-14.9 to -17	-17 to -19	0 to 2.1	2.1 to 4.1
	DW22-SB-01-01	2 of 2	11/19/22	10:57	23.4	8.55	-14.9	4.2	4.1	4.5	91%	4.1	-14.9 to -17	-17 to -19	0 to 2.1	2.1 to 4.1
	DW22-SB-01-02	1 of 2	11/19/22	11:26	24.4	9.37	-15.0	4.0	3.5	4.3	81%	3.5	-15.0 to -17	-17 to -18.5	0 to 2.0	2.0 to 3.5
	DW22-SB-01-02	2 of 2	11/19/22	11:48	25.6	9.91	-15.7	3.3	3.7	3.8	97%	3.3	-15.7 to -17	-17 to -19	0 to 1.3	1.3 to 3.3
DMMU-02	DW22-SB-02-01	1 of 2	11/19/22	12:13	25.6	10.39	-15.2	3.8	3.5	4.1	85%	3.5	-15.2 to -17	-17 to -18.7	0 to 1.8	1.8 to 3.5
	DW22-SB-02-01	2 of 2	11/19/22	12:32	25.7	10.67	-15.0	4.0	3.6	4.3	84%	3.6	-15.0 to -17	-17 to -18.6	0 to 2.0	2.0 to 3.6
	DW22-SB-02-02	1 of 2	11/19/22	12:55	25.6	10.93	-14.7	4.3	3.8	4.7	81%	3.8	-14.7 to -17	-17 to -18.5	0 to 2.3	2.3 to 3.8
	DW22-SB-02-02	2 of 2	11/19/22	13:15	25.9	11.03	-14.9	4.1	4.1	4.4	93%	4.1	-14.9 to -17	-17 to -19	0 to 2.1	2.1 to 4.1
DMMU-03	DW22-SB-03-01	2 of 3	11/19/22	14:33	25.6	10.55	-15.1	4.0	3.2	4.2	76%	3.2	-15.1 to -17	-17 to -18.3	0 to 1.9	1.9 to 3.2
	DW22-SB-03-01	3 of 3	11/19/22	14:53	25.1	10.16	-14.9	4.1	3.9	4.3	91%	3.9	-14.9 to -17	-17 to -18.8	0 to 2.1	2.1 to 3.9
	DW22-SB-03-02	1 of 2	11/19/22	15:19	24.2	9.67	-14.5	4.5	4.0	4.8	83%	4.0	-14.5 to -17	-17 to -18.5	0 to 2.5	2.5 to 4.0
	DW22-SB-03-02	2 of 2	11/19/22	15:38	23.8	9.27	-14.5	4.5	4.2	4.6	91%	4.2	-14.5 to -17	-17 to -18.7	0 to 2.5	2.5 to 4.2
DMMU-04	DW22-SA-04-01	1 of 1	11/21/22	8:35	19.9	4.87	-15.0	4.0	3.7	4.4	84%	3.7	-15.0 to -17	-17 to -18.7	0 to 2.0	2.0 to 3.7
	DW22-SA-04-02	1 of 1	11/21/22	9:10	20.6	5.12	-15.5	3.5	3.4	3.8	89%	3.4	-15.5 to -17	-17 to -18.9	0 to 1.5	1.5 to 3.4
	DW22-SA-04-03	1 of 1	11/21/22	9:44	20.7	5.56	-15.1	3.9	3.8	4.2	90%	3.8	-15.1 to -17	-17 to -18.9	0 to 1.9	1.9 to 3.8
	DW22-SA-04-04	1 of 1	11/21/22	10:17	20.9	6.34	-14.6	4.4	4.5	4.6	98%	4.4	-14.6 to -17	-17 to -19	0 to 2.4	2.4 to 4.4
	DW22-SA-04-05	1 of 1	11/20/22	15:20	25.2	10.11	-15.1	3.9	4.0	4.3	93%	3.9	-15.1 to -17	-17 to -19	0 to 1.9	1.9 to 3.9
DMMU-05	DW22-SA-05-01	1 of 1	11/20/22	11:54	23.9	9.46	-14.4	4.6	4.2	4.9	86%	4.2	-14.4 to -17	-17 to -18.6	0 to 2.6	2.6 to 4.2
	DW22-SA-05-02	1 of 1	11/20/22	12:36	25.1	10.44	-14.7	4.3	4.1	4.7	87%	4.1	-14.7 to -17	-17 to -18.8	0 to 2.3	2.3 to 4.1
	DW22-SA-05-03	1 of 1	11/20/22	13:07	24.7	10.94	-13.8	5.2	4.2	5.5	76%	4.2	-13.8 to -17	-17 to -18.0	0 to 3.2	3.2 to 4.2
	DW22-SA-05-04	1 of 1	11/20/22	13:38	25.7	11.19	-14.5	4.5	4.7	4.8	98%	4.5	-14.5 to -17	-17 to -19	0 to 2.5	2.5 to 4.5
	DW22-SA-05-05	2 of 3	11/21/22	11:15	22.0	7.89	-14.1	4.9	3.8	5.1	75%	3.8	-14.1 to -17	-17 to -17.9	0 to 2.9	2.9 to 3.8
DMMU-06	DW22-SA-06-01	1 of 1	11/20/22	14:15	26.1	11.07	-15.0	4.0	3.6	4.3	84%	3.6	-15.0 to -17	-17 to -18.6	0 to 2.0	2.0 to 3.6
	DW22-SA-06-02	2 of 3	11/20/22	10:54	19.9	7.74	-12.2	6.8	4.7	7.1	66%	4.7	-12.2 to -16.9	0 to 0.0	0 to 4.7	0.0 to 0.0
	DW22-SA-06-03	1 of 1	11/20/22	14:45	25.7	10.74	-15.0	4.0	4.4	4.5	98%	4.0	-15.0 to -17	-17 to -19	0 to 2.0	2.0 to 4.0
	DW22-SA-06-04	3 of 3	11/20/22	10:10	19.1	6.54	-12.6	6.4	4.0	6.8	59%	4.0	-12.6 to -16.6	0 to 0.0	0 to 4.0	0.0 to 0.0
	DW22-SA-06-05	3 of 3	11/20/22	9:15	18.3	5.22	-13.1	5.9	3.2	5.6	57%	3.2	-13.1 to -16.3	0 to 0.0	0 to 3.2	0.0 to 0.0
DMMU-07	DW22-TB-07-01	1 of 2	11/22/22	9:32	19.4	6.15	-13.3	5.8	2.2	4.4	50%	2.2	-13.3 to -15.5	0 to 0.0	0 to 2.2	0.0 to 0.0
	DW22-TB-07-02	3 of 3	11/22/22	15:06	27.5	12.17	-15.3	3.7	1.4	3.2	44%	1.4	-15.3 to -16.7	0 to 0.0	0 to 1.4	0.0 to 0.0
	DW22-TB-07-03*	1 of 1	11/22/22	10:27	21.1	6.93	-14.2	4.8	3.1	4.7	66%	3.1	-14.2 to -17	-17 to -17.3	0 to 2.8	2.8 to 3.1
	DW22-TB-07-04 [1]	1 of 4	11/22/22	11:05	11.4	7.72	-3.7	15.3	0.9	4.1	22%	0.9	-3.7 to -4.6	0 to 0.0	0 to 0.9	0.0 to 0.0
	DW22-TB-07-04 [1]	3 of 4	11/22/22	11:49	12.7	8.78	-3.9	15.1	0.6	7.0	9%	0.6	-3.9 to -4.5	0 to 0.0	0 to 0.6	0.0 to 0.0
	DW22-TB-07-04 [1]	4 of 4	11/22/22	12:22	13.9	9.76	-4.1	14.9	0.3	7.0	4%	0.3	-4.1 to -4.4	0 to 0.0	0 to 0.3	0.0 to 0.0
DMMU-08	DW22-TB-08-01	2 of 3	11/21/22	15:06	17.6	11.03	-6.6	12.4	1.7	10.4	16%	1.7	-7 to -8.3	0 to 0.0	0 to 1.7	0.0 to 0.0
	DW22-TB-08-02	2 of 2	11/22/22	14:07	25.9	11.98	-13.9	5.1	3.4	4.6	74%	3.4	-13.9 to -17	-17 to -17.3	0 to 3.1	3.1 to 3.4
	DW22-TB-08-03	1 of 1	11/22/22	13:20	26.6	11.29	-15.3	3.7	2.7	3.1	87%	2.7	-15.3 to -17	-17 to -18.0	0 to 1.7	1.7 to 2.7

* 0.3' of Z-sample inadvertently included with dredged material composite sample

Shaded cells – Z-layer not reached/collected

Red Text = % Recovery less than 75%

[1] Three cores were composited to create DW22-TB-07-04 due to low volume/% recovery

Table 3. DMMU Composite Plan and Chemical/Biological Analysis Performed

DMMU	Sample ID (from COC)	Sample ID	Z-sample Frozen Archive	Z-sample Bioassay Archive	Sample Frozen Archive	Sediment Conventionals	DMMP COC, Dioxin/Furans	Bioassay Archive
DMMU-01	DW22-SB-01-01 1 of 2	DW22-SB-01-01	X	X	X	X	X	X
	DW22-SB-01-01 2 of 2							
	DW22-SB-01-02 1 of 2	DW22-SB-01-02	X	X	X			
	DW22-SB-01-02 2 of 2							
DMMU-02	DW22-SB-02-01 1 of 2	DW22-SB-02-01	X	X	X	X	X	X
	DW22-SB-02-01 2 of 2							
	DW22-SB-02-02 1 of 2	DW22-SB-02-02	X	X	X			
	DW22-SB-02-02 2 of 2							
DMMU-03	DW22-SB-03-01 2 of 3	DW22-SB-03-01	X	X	X	X	X	X
	DW22-SB-03-01 3 of 3							
	DW22-SB-03-02 1 of 2	DW22-SB-03-02	X	X	X			
	DW22-SB-03-02 2 of 2							
DMMU-04	DW22-SA-04-01 1 of 1	DW22-SA-04-01	X		X	X	X	X
	DW22-SA-04-02 1 of 1	DW22-SA-04-02	X		X			
	DW22-SA-04-03 1 of 1	DW22-SA-04-03	X		X			
	DW22-SA-04-04 1 of 1	DW22-SA-04-04	X		X			
	DW22-SA-04-05 1 of 1	DW22-SA-04-05	X		X			
DMMU-05	DW22-SA-05-01 1 of 1	DW22-SA-05-01	X		X	X	X	X
	DW22-SA-05-02 1 of 1	DW22-SA-05-02	X		X			
	DW22-SA-05-03 1 of 1	DW22-SA-05-03	X		X			
	DW22-SA-05-04 1 of 1	DW22-SA-05-04	X		X			
	DW22-SA-05-05 2 of 3	DW22-SA-05-05	X		X			
DMMU-06	DW22-SA-06-01 1 of 1	DW22-SA-06-01	X		X	X	X	X
	DW22-SA-06-02 2 of 3	DW22-SA-06-02	--		X			
	DW22-SA-06-03 1 of 1	DW22-SA-06-03	X		X			
	DW22-SA-06-04 3 of 3	DW22-SA-06-04	--		X			
	DW22-SA-06-05 3 of 3	DW22-SA-06-05	--		X			
DMMU-07	DW22-TB-07-01 1 of 2	DW22-TB-07-01	--		X	X	X	X
	DW22-TB-07-02 3 of 3	DW22-TB-07-02	--		X			
	DW22-TB-07-03 1 of 1	DW22-TB-07-03	--		X			
	DW22-TB-07-04 1 of 4	DW22-TB-07-04	--		X			
	DW22-TB-07-04 3 of 4							
	DW22-TB-07-04 4 of 4							
DMMU-08	DW22-TB-08-01 2 of 3	DW22-TB-08-01	--		X	X	X	X
	DW22-TB-08-02 2 of 2	DW22-TB-08-02	X		X			
	DW22-TB-08-03 1 of 1	DW22-TB-08-03	X		X			

-- = sample not successfully collected

Table 4. Comprehensive Sampling Attempts Information

Sample ID	Date	Time	Core #	Core Length (ft)	Penetration (ft)	% Recovery	Sample Collected (ft)		Notes	Sediment Characteristics
							Sample	Z-sample		
DW22-SB-01-01	11/19/22	10:34	1 of 2	4.1	4.5	93%	2.1	2.0		Silt with sand, with clay moving deeper. Organic bands at 1.6 and 2.2'. Sandy clay towards the bottom.
DW22-SB-01-01	11/19/22	10:57	2 of 2	4.1	4.5	91%	2.1	2.0		Silt with sand transitioning to sandy silt with more clay towards bottom. Organic band at 2.3'
DW22-SB-01-02	11/19/22	11:26	1 of 2	3.5	4.3	81%	2.0	1.5		Silt with sand transitioning to sandy silt with more clay towards bottom.
DW22-SB-01-02	11/19/22	11:48	2 of 2	3.3	3.8	97%	1.3	2.0		Silt with sand transitioning to clay with sand towards bottom. Organic band at 2.8'
DW22-SB-02-01	11/19/22	12:13	1 of 2	3.5	4.1	85%	1.8	1.7		Silt with sand to 1.7' then clay with sand to 2.4. Sandy clay to bottom.
DW22-SB-02-01	11/19/22	12:32	2 of 2	3.6	4.3	84%	2.0	1.6		Silt with sand to 0.6' then clay with sand to 2.7. Sandy clay to bottom.
DW22-SB-02-02	11/19/22	12:55	1 of 2	3.8	4.7	81%	2.3	1.5		Silty sand to 0.6' then clay with sand to 1.4'. Sandy clay to 2.6' then sand with clay to bottom.
DW22-SB-02-02	11/19/22	13:15	2 of 2	4.1	4.4	93%	2.1	2.0		Silt with sand to 0.8' then clay with sand to 2.8. Sand with clay to 3.2' then sandy clay to bottom.
DW22-SB-03-01	11/19/22	14:12	1 of 3	3.8	6.1	62%	0.0	0.0		

Sample ID	Date	Time	Core #	Core Length (ft)	Penetration (ft)	% Recovery	Sample Collected (ft)		Notes	Sediment Characteristics
							Sample	Z-sample		
DW22-SB-03-01	11/19/22	14:33	2 of 3	3.2	4.2	76%	1.9	1.3		Silt with sand to 1.0' then sandy clay to 1.8'. Band of sand from 1.8' to 2.2' then clay with sand to the bottom of core.
DW22-SB-03-01	11/19/22	14:53	3 of 3	3.9	4.3	91%	2.1	1.8		Silt with sand to 0.5' then clay with sand to 1.4’ and sandy clay to bottom of core.
DW22-SB-03-02	11/19/22	15:19	1 of 2	4.0	4.8	83%	2.5	1.5		Silt with sand to 0.9' then sandy silt to 2.1'. Clay with sand to 3.5' then sand with clay to bottom of core.
DW22-SB-03-02	11/19/22	15:38	2 of 2	4.2	4.6	91%	2.5	1.7		Silt with sand to 0.9' then clay with sand to 2.1'. Band of sand with clay to 2.3' then clay with sand to bottom.
DW22-SA-04-01	11/21/22	8:35	1 of 1	3.7	4.4	84%	2.0	1.7		Silt with sand to 0.7' then clay with sand to 1.2'. Band of sand to 1.7'. Clay with sand to 2.6' with another band of sand from to 2.7' then clay with sand to bottom.
DW22-SA-04-02	11/21/22	9:10	1 of 1	3.4	3.8	89%	1.5	1.9	Relocated about 50' south due to fishing nets	Silt with sand to 0.9' then clay with sand to 2.4'. Sand with clay to 2.6' then clay with sand to bottom.
DW22-SA-04-03	11/21/22	9:44	1 of 1	3.8	4.2	90%	1.9	1.9		Silt with sand to 0.9'. Clay with sand to 2.1' and sandy clay to 2.4'. Band of sand from 2.4' to 3.0' the clay with sand to bottom of core.

Sample ID	Date	Time	Core #	Core Length (ft)	Penetration (ft)	% Recovery	Sample Collected (ft)		Notes	Sediment Characteristics
							Sample	Z-sample		
DW22-SA-04-04	11/21/22	10:17	1 of 1	4.4	4.6	98%	2.4	2.0		Silt with sand to 1.0' then sandy silt to 1.9'. Clay with sand to bottom of core.
DW22-SA-04-05	11/20/22	15:20	1 of 1	3.9	4.3	93%	1.9	2.0	Relocated station due to fishing nets.	Silt with sand to 1.0' then clay with sand to 2.5'. Sand with clay to 3.3' then clay with sand to bottom of core.
DW22-SA-05-01	11/20/22	11:54	1 of 1	4.2	4.9	86%	2.6	1.6	Relocated about 48' to south due to fishing nets.	Silt with sand to 1.0' then sand with silt to 1.7'. Clay with sand to 1.7' then clay with sand to 2.3' and sand with clay to 2.7'. An organic band from 2.7' to 3.1' transition to clay with sand to the bottom of the core.
DW22-SA-05-02	11/20/22	12:36	1 of 1	4.1	4.7	87%	2.3	1.8		Silt with sand to 1.0' then silty clay with sand to 1.5'. Sand with silt to 2.0' transition to sand with clay to 2.7' then sandy clay to bottom of core
DW22-SA-05-03	11/20/22	13:07	1 of 1	4.2	5.5	76%	3.2	1.0		Silt with sand to 1.2' then sand to 2.0'. Sandy clay to 2.9' with another layer of sand to 3.3' then sandy clay to bottom.
DW22-SA-05-04	11/20/22	13:38	1 of 1	4.5	4.8	98%	2.5	2.0	Relocated slightly due to fishing nets	Silt with sand to 1.2'. Sandy clay to 4.2' then a layer of sandy clay with organics to 4.5'.
DW22-SA-05-05	11/21/22	10:52	1 of 3	3.2	5.9	54%	0.0	0.0	Sand in core liner	

Sample ID	Date	Time	Core #	Core Length (ft)	Penetration (ft)	% Recovery	Sample Collected (ft)		Notes	Sediment Characteristics
							Sample	Z-sample		
DW22-SA-05-05	11/21/22	11:15	2 of 3	3.8	5.1	75%	2.9	0.9	Relocated 30' to the NE to avoid sand shoal	Silt with sand to 0.5' then clay with sand to 1.0'. Organic band 1.0' to 1.1'. Sand with silt to 2.6'. Sand with silt and clay to 3.3' then clay with sand to the bottom.
DW22-SA-05-05	11/21/22	11:35	3 of 3	3.5	5.1	69%	0.0	0.0		
DW22-SA-06-01	11/20/22	14:15	1 of 1	3.6	4.3	84%	2.0	1.6		Silt with sand to 1.2' then clay with sand to 2.6'. Sand with organic band to 3.0'. Sandy clay to bottom
DW22-SA-06-02	11/20/22	10:38	1 of 3	4.4	7.1	62%	0.0	0.0		
DW22-SA-06-02	11/20/22	10:54	2 of 3	4.7	7.1	66%	4.7	0.0		Silt with sand to 1.3', sand to 2.0' then sandy clay to 2.4'. Sand with silt to 3.5' with small band of sand with clay to 3.9'. Sand to bottom.
DW22-SA-06-02	11/20/22	11:18	3 of 3	4.0	7.1	56%	0.0	0.0		
DW22-SA-06-03	11/20/22	14:45	1 of 1	4.0	4.5	98%	2.0	2.0		Silt with sand to 1.0' then silty clay with sand to 2.0'. Clay with sand to 3.8'. Sand with clay to the bottom.
DW22-SA-06-04	11/20/22	9:41	1 of 3	4.2	6.3	67% [1]	0.0	0.0	Wood debris in catcher.	
DW22-SA-06-04	11/20/22	9:57	2 of 3	1.0	2.0	50%	0.0	0.0		
DW22-SA-06-04	11/20/22	10:10	3 of 3	4.0	6.8	59%	4.0	0.0		Silt with sand to 1.0' then sand to bottom.

Sample ID	Date	Time	Core #	Core Length (ft)	Penetration (ft)	% Recovery	Sample Collected (ft)		Notes	Sediment Characteristics
							Sample	Z-sample		
DW22-SA-06-05	11/20/22	8:29	1 of 3	1.5	6.2	24%	0.0	0.0	Clay in catcher	
DW22-SA-06-05	11/20/22	8:56	2 of 3	2.4	5.8	41%	0.0	0.0	Met refusal	
DW22-SA-06-05	11/20/22	9:15	3 of 3	3.2	5.6	57%	3.2	0.0	Met refusal.	Silt with sand to 0.8' with sandy clay band to 1.2'. Sand to bottom.
DW22-TB-07-01	11/22/22	9:32	1 of 2	2.2	4.4	50%	2.2	0.0	Met refusal	Silt with sand to 1.2' then sand to bottom.
DW22-TB-07-01	11/22/22	9:53	2 of 2	2.2	4.7	47%	0.0	0.0		Fine sand top 1.0' moving to coarse sand at bottom.
DW22-TB-07-02	11/22/22	14:32	1 of 3	0.0	4.3	0%	0.0	0.0	Relocated ~48' due to fishing nets. Core liner empty when retrieved	
DW22-TB-07-02	11/22/22	14:44	2 of 3	1.4	3.9	36%	0.0	0.0	Relocated ~48' due to fishing nets.	
DW22-TB-07-02	11/22/22	15:06	3 of 3	1.4	3.2	44%	1.4	0.0	Relocated ~48' due to fishing nets.	Silty sand to 0.9' then sand to bottom
DW22-TB-07-03	11/22/22	10:27	1 of 1	3.1	4.7	66%	2.8	0.3*	*Z-sample inadvertently added to dredged material sample.	Silty sand to 0.4', clay with sand to 0.8'. Sand to 3.0' with band of clay at bottom.
DW22-TB-07-04	11/22/22	11:05	1 of 4	0.9	4.1	22%	0.9	0.0		Coarse sand

Sample ID	Date	Time	Core #	Core Length (ft)	Penetration (ft)	% Recovery	Sample Collected (ft)		Notes	Sediment Characteristics
							Sample	Z-sample		
DW22-TB-07-04	11/22/22	11:27	2 of 4	0.0	3.5	0%	0.0	0.0	Core washed out.	
DW22-TB-07-04	11/22/22	11:49	3 of 4	0.6	7.0	9%	0.6	0.0		Coarse sand
DW22-TB-07-04	11/22/22	12:22	4 of 4	0.3	7.0	4%	0.3	0.0		Coarse sand
DW22-TB-08-01	11/21/22	12:05	1 of 3	2.0	7.1	28%	0.0	0.0		Coarse sand
DW22-TB-08-01	11/21/22	15:06	2 of 3	1.7	10.4	16%	1.7	0.0	Met refusal	Coarse sand
DW22-TB-08-01	11/21/22	15:50	3 of 3	1.2	10.0	12%	0.0	0.0		Coarse sand
DW22-TB-08-02	11/22/22	13:48	1 of 2	0.9	4.2	21%	0.0	0.0		
DW22-TB-08-02	11/22/22	14:07	2 of 2	3.4	4.6	74%	3.1	0.3		Organic silty sand to 0.4' then sand to 1.1'. Band of sand with silt to 1.3' then sand to 2.2'. Sand with silt to 2.6' to sand to 2.9'. Sand with silt to 3.0' then sand to bottom.
DW22-TB-08-03	11/22/22	13:20	1 of 1	2.7	3.1	87%	1.7	1.0		Silt with sand to 1.0' changing to sand with silt until 2.1'. Sand to bottom.

Samples highlighted used for the dredged material characterization.

Samples highlighted not retained.

% Recovery less than 75%

[1] Core was measured prior to fully settling. It likely would have continued settling at a similar rate to SA-06-04 3 of 3 and would have had a final % recovery closer to 55%.

Table 5. Laboratory and Validator Qualifier Definitions

Laboratory Qualifier Definitions			
*	The result is an outlier. See case narrative.		
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.		
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.		
D	The reported result is from a dilution.		
J	The result is an estimated value. Concentration found below MRL.		
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.		
K	A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate.		
U	The analyte was analyzed for but was not detected ("Non-detect") at or above the MRL/MDL.		
N	Not detected due to incorrect ion ratio. Concentration reported is EMPC. This value is not included in Totals.		
Validator Qualifier Definitions			
U	The analyte was analyzed but was not detected above the reported sample quantitation limit.		
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.		
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents the approximate concentration.		
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.		
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.		
Abbreviations			
SL	Screening Level	MDL	Method Detection Limit
BT	Bioaccumulation Trigger	µg/kg	microgram/kilogram
ML	Maximum Level	mg/kg	milligram/kilogram
RL	Reporting Limit		

Table 6. Sediment Conventionals, COC, & Dioxin/Furans Analysis Results Compared to DMMP Guidelines Section B (DMMU-01 – DMMU-03)

Parameter	DMMP Marine Guidelines			DMMU-01					DMMU-02					DMMU-03				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter				Lab	Inter
SEDIMENT CONVENTIONALS																		
Total solids (%)				58.7				J	48.2				J	48.1				J
Total volatile solids (TVS) (%)				7.1	0.1			J	7.3	0.1			J	7.2	0.1			J
Total organic carbon (TOC) (%)				2.46	0.05	0.02			2.64	0.05	0.02			2.59	0.05	0.02		
Total Sulfides (mg/kg)				2470	970	490			3300	1200	610			2900	1200	620		
Ammonia (mg/kg NH3-N)				51.8	1.6	0.2		J	86.1	2	0.2		J	82.4	2	0.2		J
Particle/Grain Size, Gravel (%)				0					0					0.2				
Particle/Grain Size, Sand (%)				30.5					21.94					32.8				
Particle/Grain Size, Silt (%)				56.77					62.61					55.6				
Particle/Grain Size, Clay (%)				11.66					13.35					11.73				
Percent Fines (Silt + Clay)				68.43					75.96					67.33				
METALS (mg/kg dry weight)																		
Antimony	150	---	200	0.181	0.075	0.03		J	0.2	0.09	0.036		J	0.179	0.091	0.036		J
Arsenic	57	507.1	700	8.75	0.75	0.09			11.3	0.9	0.11			10.1	0.91	0.11		
Cadmium	5.1	--	14	0.19	0.03	0.01			0.234	0.036	0.013			0.192	0.036	0.013		
Chromium	260	--	---	21.8	0.3	0.09			25.7	0.36	0.11			22.8	0.36	0.11		
Copper	390	--	1300	30.8	0.15	0.06			38.5	0.18	0.07			35	0.18	0.07		
Lead	450	975	1200	10.2	0.075	0.03		J	14.4	0.09	0.036		J	12	0.091	0.036		J
Mercury	0.41	1.5	2.3	0.076	0.034	0.003			0.093	0.04	0.004			0.082	0.037	0.004		
Selenium	---	3	---	0.3	1.5	0.1	J	J	0.4	1.8	0.2	J	J	0.3	1.8	0.2	J	J
Silver	6.1	--	8.4	0.087	0.03	0.006			0.109	0.036	0.007			0.083	0.036	0.007		
Zinc	410	--	3800	70.3	0.75	0.3			87.1	0.9	0.36			78.3	0.91	0.36		
ORGANICS																		
PAHs (µg/kg dry weight)																		
LPAH																		
Naphthalene	2100	---	2400	5	17	5	*,U	UJ	6.9	21	6	*,J	J	8.9	21	6.1	*,J	J
Acenaphthylene	560	---	1300	4.5	17	4.5	*,U	UJ	5.4	21	5.4	*,U	UJ	6.4	21	5.4	*,J	J
Acenaphthene	500	---	2000	5.5	17	5.5	*,U	UJ	6.7	21	6.7	*,U	UJ	9.1	21	6.7	*,J	J
Fluorene	540	---	3600	5.6	17	5.6	*,U	UJ	7.2	21	6.9	*,J	J	19	21	6.9	*,J	J
Phenanthrene	1500	---	21000	24	17	6.2	*	J	47	21	7.5	*	J	64	21	7.5	*	J
Anthracene	960	---	13000	5.5	17	5.5	*,U	UJ	9.8	21	6.7	*,J	J	30	21	6.7	*	J
2-Methylnaphthalene	670	---	1900	6.4	17	4.8	*,J	J	8.6	21	5.8	*,J	J	12	21	5.9	*,J	J
Total LPAH	5200	---	29000	24				J	70.9				J	137.4				J

Parameter	DMMP Marine Guidelines			DMMU-01					DMMU-02					DMMU-03				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter				Lab	Inter
HPAH																		
Fluoranthene	1700	4600	30000	62	17	6.3	*	J	140	21	7.7	*	J	150	21	7.7	*	J
Pyrene	2600	11980	16000	54	17	6.3	*	J	120	21	7.7	*	J	130	21	7.7	*	J
Benz(a)anthracene	1300	---	5100	21	17	6.2	*	J	48	21	7.5	*	J	55	21	7.5	*	J
Chrysene	1400	---	21000	31	17	7	*	J	66	21	8.5	*	J	81	21	8.6	*	J
Benzofluoranthenes (b)				43	17	5.8	*	J	90	21	7.1	*	J	91	21	7.1	*	J
Benzofluoranthenes (k)				14	17	6.8	*,J	J	33	21	8.3	*	J	40	21	8.3	*	J
Benzofluoranthenes (b, j ,k)*	3200	---	9900	57				J	123				J	131				J
Benzo(a)pyrene	1600	---	3600	24	17	6.2	*	J	51	21	7.5	*	J	55	21	7.5	*	J
Indeno(1,2,3-c,d)pyrene	600	---	4400	23	17	5.5	*	J	46	21	6.7	*	J	48	21	6.7	*	J
Dibenz(a,h)anthracene	230	---	1900	5.1	17	5.1	*,U	UJ	6.6	21	6.3	*,J	J	12	21	6.3	*,J	J
Benzo(g,h,i)perylene	670	---	3200	21	17	6.3	*	J	42	21	7.7	*	J	39	21	7.7	*	J
Total HPAH	12000	---	69000	293				J	642.6				J	701				J
CHLORINATED HYDROCARBONS (µg/kg dry weight)																		
1,4-Dichlorobenzene	110	---	120	4.3	17	4.3	*,U	UJ	5.2	21	5.2	*,U	UJ	5.2	21	5.2	*,U	UJ
1,2-Dichlorobenzene	35	---	110	4.1	17	4.1	*,U	UJ	5	21	5	*,U	UJ	5	21	5	*,U	UJ
1,2,4-Trichlorobenzene	31	---	64	4.5	17	4.5	*,U	UJ	5.4	21	5.4	*,U	UJ	5.4	21	5.4	*,U	UJ
Hexachlorobenzene (HCB)	22	168	230	5.6	17	5.6	*,U	UJ	6.9	21	6.9	*,U	UJ	11	21	6.9	*,J	J
PHTHALATES (µg/kg dry weight)																		
Dimethyl phthalate	71	---	1400	6.8	17	6.8	*,U	UJ	8.3	21	8.3	*,U	UJ	25	21	8.3	*	J
Diethyl phthalate	200	---	1200	6.3	17	6.3	*,U	UJ	7.7	21	7.7	*,U	UJ	30	21	7.7	*	J
Di-n-butyl phthalate	1400	---	5100	11	34	8.2	*,J	J	15	41	10	*,J	J	46	41	10	*	J
Butyl benzyl phthalate	63	---	970	6.3	17	6.3	*,U	UJ	11	21	7.7	*,J	J	30	21	7.7	*	J
Bis(2-ethylhexyl) phthalate	1300	---	8300	70	170	16	*,J	J	120	210	19	*,J	J	140	210	19	*,J	J
Di-n-octyl phthalate	6200	---	6200	5.5	17	5.5	*,U	UJ	6.7	21	6.7	*,U	UJ	6.7	21	6.7	*,U	UJ
PHENOLS (µg/kg dry weight)																		
Phenol	420	---	1200	11	51	5.3	*,J	J	14	62	6.5	*,J	J	14	62	6.5	*,J	J
2-Methylphenol	63	---	77	7	17	7	*,U	UJ	8.5	21	8.5	*,U	UJ	8.6	21	8.6	*,U	UJ
4-Methylphenol	670	---	3600	7.7	34	7.7	*,U	UJ	9.4	41	9.4	*,U	UJ	9.4	41	9.4	*,U	UJ
2,4-Dimethylphenol	29	---	210	11	85	11	*,U	UJ	14	100	14	*,U	UJ	14	100	14	*,U	UJ
Pentachlorophenol	400	504	690	9	170	9	*,U	R	11	210	11	*,U	R	11	210	11	*,U	R

Parameter	DMMP Marine Guidelines			DMMU-01					DMMU-02					DMMU-03				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter				Lab	Inter
MISCELLANEOUS EXTRACTABLES (µg/kg dry weight)																		
Benzyl alcohol	57	---	870	23	34	8.4	*,J	J	13	41	11	*,J	J	22	41	11	*,J	J
Benzoic acid	650	---	760	170	680	170	*,U	UJ	200	830	200	*,U	UJ	200	830	200	*,U	UJ
Dibenzofuran	540	---	1700	5.8	17	5.8	*,U	UJ	7.1	21	7.1	*,U	UJ	19	21	7.1	*,J	J
Hexachlorobutadiene	11	---	270	5.1	17	5.1	*,U	UJ	6.3	21	6.3	*,U	UJ	6.3	21	6.3	*,U	UJ
N-Nitrosodiphenylamine	28	---	130	5.5	17	5.5	*,U	UJ	6.7	21	6.7	*,U	UJ	17	21	6.7	*,J	J
PESTICIDES & PCBs (µg/kg dry weight)																		
4,4’-DDD	16	---	---	0.613	0.1	0.1			1.256	0.1	0.1			1.05	0.1	0.1		
4,4’-DDE	9	---	---	0.605	0.1	0.1			0.676	0.1	0.1			0.538	0.1	0.1		
4,4’-DDT	12	---	---	1.117	0.1	0.1			0.145	0.1	0.1			1.442	0.1	0.1		
sum of 4,4’-DDD, 4,4’-DDE, 4,4’-DDT	---	50	69	2.335					2.077					3.03				
Aldrin	9.5	---	---	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
cis-Chlordane				0.172	0.1	0.1			0.26	0.1	0.1	N	J	0.162	0.1	0.1		
cis-Nonachlor				0.156	0.1	0.1			0.15	0.1	0.1			0.168	0.1	0.1	N	J
Oxychlordane				0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
trans-Chlordane				0.215	0.1	0.1			0.197	0.1	0.1			0.3	0.1	0.1	N	J
trans-Nonachlor				0.18	0.1	0.1			0.154	0.1	0.1			0.102	0.1	0.1	N	J
Total Chlordane (sum of cis-chlordane, trans- chlordane, cis-nonachlor, trans- nonachlor, oxychlordane)	2.8	37	---	0.723					0.761				J	0.732				J
Dieldrin	1.9	---	1700	0.159	0.1	0.1			0.147	0.1	0.1			0.135	0.1	0.1		
Heptachlor	1.5	---	270	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
PCB-aroclor 1016				0.85	3.4	0.85	U	U	1.1	4.2	1.1	U	U	1.1	4.2	1.1	U	U
PCB-aroclor 1221				0.85	3.4	0.85	U	U	1.1	4.2	1.1	U	U	1.1	4.2	1.1	U	U
PCB-aroclor 1232				0.85	3.4	0.85	U	U	1.1	4.2	1.1	U	U	1.1	4.2	1.1	U	U
PCB-aroclor 1242				9.1	3.4	0.85	P	J	17	4.2	1.1			23	4.2	1.1		
PCB-aroclor 1248				0.85	3.4	0.85	U	U	1.1	4.2	1.1	U	U	1.1	4.2	1.1	U	U
PCB-aroclor 1254				16	3.4	0.85			50	4.2	1.1			23	4.2	1.1		
PCB-aroclor 1260				9.3	3.4	0.85			20	4.2	1.1			11	4.2	1.1		
Total PCBs (Aroclors)	130	38[(1)]	3100	34.4				J	87					57				

Parameter	DMMP Marine Guidelines			DMMU-01					DMMU-02					DMMU-03				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter				Lab	Inter
DIOXINS/FURANS (ng/kg dry weight)																		
2,3,7,8-TCDD				0.459	0.484	0.459	U	UJ	0.786	0.786	0.786	U	UJ	0.635	0.635	0.635	U	UJ
1,2,3,7,8-PECDD				0.162	2.42	0.162	U	UJ	0.266	2.48	0.266	U	UJ	0.235	2.5	0.235	U	UJ
1,2,3,4,7,8,-HxCDD				0.13	2.42	0.0271	BJK	UJ	0.369	2.48	0.369	U	UJ	0.319	2.5	0.319	U	UJ
1,2,3,6,7,8-HxCDD				0.0265	2.42	0.0265	U	UJ	0.361	2.48	0.361	U	UJ	0.492	2.5	0.301	JK	UJ
1,2,3,7,8,9-HxCDD				0.185	2.42	0.0268	J	J	0.365	2.48	0.365	U	UJ	0.31	2.5	0.31	U	UJ
1,2,3,4,6,7,8,-HpCDD				3	2.42	0.226		J	3.95	2.48	0.383	K	J	7.33	2.5	0.316		J
OCDD				29	4.84	0.426		J	41.6	4.96	0.757		J	71.6	5	0.84		J
2,3,7,8-TCDF				0.498	0.498	0.498	U	UJ	0.869	0.869	0.869	U	UJ	0.59	0.59	0.59	U	UJ
1,2,3,7.8.-PeCDF				0.317	2.42	0.317	U	UJ	0.614	2.48	0.614	U	UJ	0.463	2.5	0.463	U	UJ
2,3,4,7,8-PECDF				0.308	2.42	0.308	U	UJ	0.61	2.48	0.61	U	UJ	0.478	2.5	0.478	U	UJ
1,2,3,4,7,8-HXCDF				0.184	2.42	0.0177	BJK	UJ	0.124	2.48	0.124	U	UJ	0.313	2.5	0.0516	BJ	UJ
1,2,3,6,7,8-HxCDF				0.101	2.42	0.0196	BJK	UJ	0.138	2.48	0.138	U	UJ	0.0713	2.5	0.0596	BJK	UJ
1,2,3,7,8,9-HxCDF				0.239	2.42	0.0247	BJ	UJ	0.17	2.48	0.17	U	UJ	0.0977	2.5	0.0746	BJK	UJ
2,3,4,6,7,8-HxCDF				0.0172	2.42	0.0172	U	UJ	0.21	2.48	0.115	BJ	UJ	0.185	2.5	0.0508	BJK	UJ
1,2,3,4,6,7,8-HpCDF				0.524	2.42	0.0822	BJK	UJ	1.12	2.48	0.0362	J	J	1.63	2.5	0.134	J	J
1,2,3,4,7,8,9-HpCDF				0.079	2.42	0.079	U	UJ	0.0993	2.48	0.0366	BJK	UJ	0.127	2.5	0.127	U	UJ
OCDF				2.57	4.84	0.234	BJ	J	3.61	4.96	0.563	BJ	J	5.12	5	0.91		J
Total Tetra-Dioxins				0.459	0.484	0.459	U	UJ	0.786	0.786	0.786	U	UJ	0.635	0.635	0.635	U	UJ
Total Penta-Dioxins				0.162	2.42	0.162	U	UJ	0.266	2.48	0.266	U	UJ	0.235	2.5	0.235	U	UJ
Total Hexa-Dioxins				0.185	2.42	0.0268	J	J	0.365	2.48	0.365	U	UJ	1.55	2.5	0.31	J	J
Total Hepta-Dioxins				3	2.42	0.226		J	0.383	2.48	0.383	U	UJ	20.1	2.5	0.316		J
Total Tetra-Furans				0.498	0.498	0.498	U	UJ	0.869	0.869	0.869	U	UJ	0.59	0.59	0.59	U	UJ
Total Penta-Furans				0.313	2.42	0.313	U	UJ	0.612	2.48	0.612	U	UJ	0.47	2.5	0.47	U	UJ
Total Hexa-Furans				0.239	2.42	0.0194	J	J	0.21	2.48	0.134	J	J	1.13	2.5	0.058	J	J
Total Hepta-Furans				1.09	2.42	0.0804	J	J	3.77	2.48	0.0364		J	1.63	2.5	0.13	J	J
Dioxin/Furan TEQ (ng/Kg) (TEC*ND EDL *0.5)	---	10	---	0.482					0.822					0.746				

(1) This value is normalized to TOC and expressed in mg/kg carbon

Shaded cells Pentachlorophenol data rejected during data validation

Table 7. Sediment Conventionals, COC, & Dioxin/Furans Analysis Results Compared to DMMP Guidelines Section A (DMMU-04 – DMMU-06)

Parameter	DMMP Marine Guidelines			DMMU-04					DMMU-05					DMMU-06				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter				Lab	Inter
SEDIMENT CONVENTIONALS																		
Total solids (%)				46.5				J	51.7				J	64.7				J
Total volatile solids (TVS) (%)				7.4	0.1			J	6.7	0.1			J	4.5	0.1			J
Total organic carbon (TOC) (%)				2.57	0.05	0.02			2.39	0.05	0.02			1.53	0.05	0.02		
Total Sulfides (mg/kg)				2200	1200	630			2100	1100	560			710	430	220		
Ammonia (mg/kg NH3-N)				90.9	2.1	0.2		J	86.6	1.9	0.2		J	44.6	1.5	0.2		J
Particle/Grain Size, Gravel (%)				0					0					0				
Particle/Grain Size, Sand (%)				35.09					46.28					70.92				
Particle/Grain Size, Silt (%)				48.2					37.22					15.78				
Particle/Grain Size, Clay (%)				13.11					9.69					6.24				
Percent Fines (Silt + Clay)				61.31					46.91					22.02				
METALS (mg/kg dry weight)																		
Antimony	150	---	200	0.19	0.11	0.04		J	0.169	0.089	0.035		J	0.117	0.077	0.031		J
Arsenic	57	507.1	700	12.4	1.1	0.1			10.6	0.89	0.11			6.8	0.77	0.09		
Cadmium	5.1	--	14	0.184	0.043	0.015			0.176	0.035	0.012			0.093	0.031	0.011		
Chromium	260	--	---	23.9	0.43	0.13			22	0.35	0.11			15.5	0.31	0.09		
Copper	390	--	1300	37.3	0.21	0.09			32.6	0.18	0.07			19	0.15	0.06		
Lead	450	975	1200	12.9	0.11	0.04		J	10.7	0.089	0.035		J	6.66	0.077	0.031		J
Mercury	0.41	1.5	2.3	0.16	0.039	0.004			0.075	0.038	0.004			0.036	0.028	0.003		
Selenium	---	3	---	0.4	2.1	0.2	J	J	0.3	1.8	0.2	J	J	0.2	1.5	0.1	J	J
Silver	6.1	--	8.4	0.08	0.043	0.009			0.073	0.035	0.007			0.037	0.031	0.006		
Zinc	410	--	3800	86.2	1.1	0.4			77.2	0.89	0.35			52.6	0.77	0.31		
ORGANICS																		
PAHs (µg/kg dry weight)																		
LPAH																		
Naphthalene	2100	---	2400	6.3	21	6.3	*,U	UJ	6	19	5.6	*,J	J	4.5	15	4.5	*,U	UJ
Acenaphthylene	560	---	1300	5.6	21	5.6	*,U	UJ	5.1	19	5.1	*,U	UJ	4.1	15	4.1	*,U	UJ
Acenaphthene	500	---	2000	6.9	21	6.9	*,U	UJ	6.2	19	6.2	*,U	UJ	5	15	5	*,U	UJ
Fluorene	540	---	3600	7.1	21	7.1	*,U	UJ	6.4	19	6.4	*,U	UJ	5.1	15	5.1	*,U	UJ
Phenanthrene	1500	---	21000	30	21	7.8	*	J	34	19	7	*	J	19	15	5.6	*	J
Anthracene	960	---	13000	7	21	6.9	*,J	J	6.2	19	6.2	*,U	UJ	5	15	5	*,U	UJ
2-Methylnaphthalene	670	---	1900	7	21	6.1	*,J	J	9.8	19	5.4	*,J	J	8.4	15	4.4	*,J	J
Total LPAH	5200	---	29000	37				J	40				J	19				J

Parameter	DMMP Marine Guidelines			DMMU-04					DMMU-05					DMMU-06				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter				Lab	Inter
HPAH																		
Fluoranthene	1700	4600	30000	84	21	8	*	J	65	19	7.2	*	J	32	15	5.8	*	J
Pyrene	2600	11980	16000	74	21	8	*	J	58	19	7.2	*	J	28	15	5.8	*	J
Benz(a)anthracene	1300	---	5100	36	21	7.8	*	J	24	19	7	*	J	12	15	5.6	*,J	J
Chrysene	1400	---	21000	54	21	8.9	*	J	34	19	8	*	J	17	15	6.4	*	J
Benzofluoranthenes (b)				64	21	7.3	*	J	44	19	6.6	*	J	22	15	5.3	*	J
Benzofluoranthenes (k)				21	21	8.6	*	J	12	19	7.8	*,J	J	6.2	15	6.2	*,U	UJ
Benzofluoranthenes (b, j ,k)*	3200	---	9900	85				J	56				J	22				J
Benzo(a)pyrene	1600	---	3600	36	21	7.8	*	J	25	19	7	*	J	11	15	5.6	*,J	J
Indeno(1,2,3-c,d)pyrene	600	---	4400	30	21	6.9	*	J	21	19	6.2	*	J	10	15	5	*,J	J
Dibenz(a,h)anthracene	230	---	1900	6.5	21	6.5	*,U	UJ	5.8	19	5.8	*,U	UJ	4.7	15	4.7	*,U	UJ
Benzo(g,h,i)perylene	670	---	3200	27	21	8	*	J	20	19	7.2	*	J	8.9	15	5.8	*,J	J
Total HPAH	12000	---	69000	426				J	303				J	140.9				J
CHLORINATED HYDROCARBONS (µg/kg dry weight)																		
1,4-Dichlorobenzene	110	---	120	5.4	21	5.4	*,U	UJ	4.9	19	4.9	*,U	UJ	3.9	15	3.9	*,U	UJ
1,2-Dichlorobenzene	35	---	110	5.2	21	5.2	*,U	UJ	4.7	19	4.7	*,U	UJ	3.8	15	3.8	*,U	UJ
1,2,4-Trichlorobenzene	31	---	64	5.6	21	5.6	*,U	UJ	5.1	19	5.1	*,U	UJ	4.1	15	4.1	*,U	UJ
Hexachlorobenzene (HCB)	22	168	230	7.1	21	7.1	*,U	UJ	6.4	19	6.4	*,U	UJ	5.1	15	5.1	*,U	UJ
PHTHALATES (µg/kg dry weight)																		
Dimethyl phthalate	71	---	1400	8.6	21	8.6	*,U	UJ	7.8	19	7.8	*,U	UJ	6.2	15	6.2	*,U	UJ
Diethyl phthalate	200	---	1200	8	21	8	*,U	UJ	7.2	19	7.2	*,U	UJ	5.8	15	5.8	*,U	UJ
Di-n-butyl phthalate	1400	---	5100	20	43	11	*,J	J	13	39	9.3	*,J	J	9.3	31	7.5	*,J	J
Butyl benzyl phthalate	63	---	970	12	21	8	*,J	J	8.1	19	7.2	*,J	J	9	15	5.8	*,J	J
Bis(2-ethylhexyl) phthalate	1300	---	8300	150	210	20	*,J	J	74	190	18	*,J	J	51	150	14	*,J	J
Di-n-octyl phthalate	6200	---	6200	6.9	21	6.9	*,U	UJ	16	19	6.2	*,J	J	5	15	5	*,U	UJ
PHENOLS (µg/kg dry weight)																		
Phenol	420	---	1200	12	64	6.7	*,J	J	9.5	58	6	*,J	J	7.6	46	4.8	*,J	J
2-Methylphenol	63	---	77	8.9	21	8.9	*,U	UJ	8	19	8	*,U	UJ	6.4	15	6.4	*,U	UJ
4-Methylphenol	670	---	3600	12	43	9.7	*,J	J	11	39	8.7	*,J	J	12	31	7	*,J	J
2,4-Dimethylphenol	29	---	210	14	110	14	*,U	UJ	13	96	13	*,U	UJ	9.8	77	9.8	*,U	UJ
Pentachlorophenol	400	504	690	12	210	12	*,U	R	11	190	11	*,U	R	8.2	150	8.2	*,U	UJ

Parameter	DMMP Marine Guidelines			DMMU-04					DMMU-05					DMMU-06				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter				Lab	Inter
MISCELLANEOUS EXTRACTABLES (µg/kg dry weight)																		
Benzyl alcohol	57	---	870	20	43	11	*,J	J	16	39	9.5	*,J	J	12	31	7.6	*,J	J
Benzoic acid	650	---	760	210	860	210	*,U	UJ	190	770	190	*,U	UJ	150	620	150	*,U	UJ
Dibenzofuran	540	---	1700	7.3	21	7.3	*,U	UJ	6.6	19	6.6	*,U	UJ	5.3	15	5.3	*,U	UJ
Hexachlorobutadiene	11	---	270	6.5	21	6.5	*,U	UJ	5.8	19	5.8	*,U	UJ	4.7	15	4.7	*,U	UJ
N-Nitrosodiphenylamine	28	---	130	6.9	21	6.9	*,U	UJ	6.2	19	6.2	*,U	UJ	5	15	5	*,U	UJ
PESTICIDES & PCBs (µg/kg dry weight)																		
4,4’-DDD	16	---	---	1.058	0.1	0.1			0.786	0.1	0.1			0.377	0.1	0.1		
4,4’-DDE	9	---	---	0.542	0.1	0.1			0.506	0.1	0.1			0.258	0.1	0.1		
4,4’-DDT	12	---	---	0.872	0.1	0.1			1.256	0.1	0.1			1.065	0.1	0.1		
sum of 4,4’-DDD, 4,4’-DDE, 4,4’-DDT	---	50	69	2.472					2.548					1.7				
Aldrin	9.5	---	---	0.217	0.1	0.1			0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
cis-Chlordane				0.184	0.1	0.1			0.141	0.1	0.1			0.1	0.1	0.1	U	U
cis-Nonachlor				0.158	0.1	0.1			0.143	0.1	0.1	N	J	0.1	0.1	0.1	U	U
Oxychlordane				0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
trans-Chlordane				0.171	0.1	0.1			0.178	0.1	0.1			0.1	0.1	0.1	U	U
trans-Nonachlor				0.165	0.1	0.1			0.18	0.1	0.1			0.1	0.1	0.1	U	U
Total Chlordane (sum of cis-chlordane, trans- chlordane, cis-nonachlor, trans- nonachlor, oxychlordane)	2.8	37	---	0.678				U	0.642				J	0.1				U
Dieldrin	1.9	---	1700	0.152	0.1	0.1			0.155	0.1	0.1			0.102	0.1	0.1		
Heptachlor	1.5	---	270	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
PCB-aroclor 1016				1.1	4.3	1.1	U	U	0.97	3.9	0.97	U	U	0.77	3.1	0.77	U	U
PCB-aroclor 1221				1.1	4.3	1.1	U	U	0.97	3.9	0.97	U	U	0.77	3.1	0.77	U	U
PCB-aroclor 1232				1.1	4.3	1.1	U	U	0.97	3.9	0.97	U	U	0.77	3.1	0.77	U	U
PCB-aroclor 1242				8.7	4.3	1.1			7.3	3.9	0.97	P	J	3.8	3.1	0.77	P	NJ
PCB-aroclor 1248				1.1	4.3	1.1	U	U	0.97	3.9	0.97	U	U	0.77	3.1	0.77	U	U
PCB-aroclor 1254				14	4.3	1.1			13	3.9	0.97			5.2	3.1	0.77		
PCB-aroclor 1260				7.9	4.3	1.1			10	3.9	0.97			3	3.1	0.77	J	J
Total PCBs (Aroclors)	130	38[(1)]	3100	30.6					30.3				J	12				NJ

Parameter	DMMP Marine Guidelines			DMMU-04					DMMU-05					DMMU-06				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter				Lab	Inter
DIOXINS/FURANS (ng/kg dry weight)																		
2,3,7,8-TCDD				0.541	0.541	0.541	U	UJ	0.196	0.492	0.196	U	UJ	0.534	0.534	0.534	U	UJ
1,2,3,7,8-PECDD				0.219	2.44	0.219	U	UJ	0.163	2.46	0.0764	BJ	J	0.255	2.47	0.255	U	UJ
1,2,3,4,7,8,-HxCDD				0.138	2.44	0.138	U	UJ	0.394	2.46	0.0519	BJK	UJ	0.218	2.47	0.127	BJK	UJ
1,2,3,6,7,8-HxCDD				0.129	2.44	0.129	U	UJ	0.292	2.46	0.054	BJK	UJ	0.469	2.47	0.12	JK	UJ
1,2,3,7,8,9-HxCDD				0.295	2.44	0.133	JK	UJ	0.167	2.46	0.0505	BJ	J	0.278	2.47	0.124	JK	UJ
1,2,3,4,6,7,8,-HpCDD				8.37	2.44	0.289		J	11	2.46	0.359		J	30.4	2.47	0.599		J
OCDD				68.9	4.89	0.799		J	86.8	4.92	0.462		J	357	4.95	0.797		J
2,3,7,8-TCDF				0.561	0.561	0.561	U	UJ	0.0645	0.492	0.0645	U	UJ	0.507	0.507	0.507	U	UJ
1,2,3,7.8.-PeCDF				0.361	2.44	0.361	U	UJ	0.126	2.46	0.0636	BJK	UJ	0.279	2.47	0.279	U	UJ
2,3,4,7,8-PECDF				0.362	2.44	0.362	U	UJ	0.0719	2.46	0.0688	BJK	UJ	0.281	2.47	0.281	U	UJ
1,2,3,4,7,8-HXCDF				0.153	2.44	0.0684	BJK	UJ	0.157	2.46	0.0521	BJK	UJ	0.14	2.47	0.114	BJK	UJ
1,2,3,6,7,8-HxCDF				0.0797	2.44	0.0797	U	UJ	0.146	2.46	0.0559	BJ	J	0.13	2.47	0.13	U	UJ
1,2,3,7,8,9-HxCDF				0.106	2.44	0.106	U	UJ	0.16	2.46	0.16	U	UJ	0.161	2.47	0.161	U	UJ
2,3,4,6,7,8-HxCDF				0.0713	2.44	0.0713	U	UJ	0.163	2.46	0.061	BJ	J	0.111	2.47	0.111	U	UJ
1,2,3,4,6,7,8-HpCDF				1.84	2.44	0.111	JK	UJ	1.21	2.46	0.408	BJK	UJ	10.4	2.47	0.197		J
1,2,3,4,7,8,9-HpCDF				0.261	2.44	0.117	BJK	UJ	0.26	2.46	0.138	BJ	UJ	0.283	2.47	0.219	BJK	UJ
OCDF				9.54	4.89	0.669		J	6.5	4.92	0.374		J	51.8	4.95	0.722		J
Total Tetra-Dioxins				0.541	0.541	0.541	U	UJ	0.196	0.492	0.196	U	UJ	0.534	0.534	0.534	U	UJ
Total Penta-Dioxins				0.219	2.44	0.219	U	UJ	0.273	2.46	0.0764	J	J	0.255	2.47	0.255	U	UJ
Total Hexa-Dioxins				1.15	2.44	0.133	J	J	4.5	2.46	0.0521		J	7.04	2.47	0.123		J
Total Hepta-Dioxins				22.1	2.44	0.289		J	37.2	2.46	0.359		J	169	2.47	0.599		J
Total Tetra-Furans				0.561	0.561	0.561	U	UJ	0.0645	0.492	0.0645	U	UJ	0.507	0.507	0.507	U	UJ
Total Penta-Furans				0.361	2.44	0.361	U	UJ	0.0659	2.46	0.0659	U	UJ	0.28	2.47	0.28	U	UJ
Total Hexa-Furans				0.81	2.44	0.0791	J	J	1.37	2.46	0.0664	J	J	3.47	2.47	0.127		J
Total Hepta-Furans				5.75	2.44	0.114		J	4.54	2.46	0.242		J	39.4	2.47	0.208		J
Dioxin/Furan TEQ (ng/Kg) (TEC*ND EDL *0.5)	---	10	---	0.634					0.520					1.074				

(1) This value is normalized to TOC and expressed in mg/kg carbon

Shaded cells Pentachlorophenol data rejected during data validation

Table 8. Sediment Conventionals, COC, & Dioxin/Furans Analysis Results Compared to DMMP Guidelines Turning Basin (DMMU-07 - DMMU-08)

Parameter	DMMP Marine Guidelines			DMMU-07					DMMU-08				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter
SEDIMENT CONVENTIONALS													
Total solids (%)				72.1				J	71.6				J
Total volatile solids (TVS) (%)				2.8	0.1				2.5	0.1			J
Total organic carbon (TOC) (%)				0.825	0.05	0.02			0.805	0.05	0.02		
Total Sulfides (mg/kg)				230	150	76			190	150	76	*	J
Ammonia (mg/kg NH3-N)				17.4	0.69	0.06		J	18.2	0.67	0.06		J
Particle/Grain Size, Gravel (%)				1.99					1.08				
Particle/Grain Size, Sand (%)				86.98					88.74				
Particle/Grain Size, Silt (%)				6.58					8.05				
Particle/Grain Size, Clay (%)				3.19					3.6				
Percent Fines (Silt + Clay)				9.77					11.65				
METALS (mg/kg dry weight)													
Antimony	150	---	200	0.081	0.067	0.027		J	0.059	0.064	0.026	J	J
Arsenic	57	507.1	700	6.44	0.67	0.08			5.58	0.64	0.08		
Cadmium	5.1	--	14	0.058	0.027	0.009			0.057	0.026	0.009		
Chromium	260	--	---	14.7	0.27	0.08			12	0.26	0.08		
Copper	390	--	1300	16.1	0.13	0.05			13.8	0.13	0.05		
Lead	450	975	1200	4.84	0.067	0.027		J	4.2	0.064	0.026		J
Mercury	0.41	1.5	2.3	0.029	0.024	0.002			0.024	0.025	0.003	J	J
Selenium	---	3	---	0.1	1.3	0.1	U	U	0.1	1.3	0.1	U	U
Silver	6.1	--	8.4	0.024	0.027	0.005	J	J	0.022	0.026	0.005	J	J
Zinc	410	--	3800	49.4	0.67	0.27			45.9	0.64	0.26		
ORGANICS													
PAHs (µg/kg dry weight)													
LPAH													
Naphthalene	2100	---	2400	4.1	14	4.1	*,U	UJ	4.1	14	4.1	*,U	UJ
Acenaphthylene	560	---	1300	3.7	14	3.7	*,U	UJ	3.7	14	3.7	*,U	UJ
Acenaphthene	500	---	2000	4.5	14	4.5	*,U	UJ	4.5	14	4.5	*,U	UJ
Fluorene	540	---	3600	4.6	14	4.6	*,U	UJ	4.6	14	4.6	*,U	UJ
Phenanthrene	1500	---	21000	27	14	5	*	J	14	14	5.1	*,J	J
Anthracene	960	---	13000	4.5	14	4.5	*,U	UJ	4.5	14	4.5	*,U	UJ
2-Methylnaphthalene	670	---	1900	7.4	14	3.9	*,J	J	3.9	14	3.9	*,U	UJ
Total LPAH	5200	---	29000	27				J	14				J

Parameter	DMMP Marine Guidelines			DMMU-07					DMMU-08				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter
HPAH													
Fluoranthene	1700	4600	30000	28	14	5.2	*	J	17	14	5.2	*	J
Pyrene	2600	11980	16000	20	14	5.2	*	J	15	14	5.2	*	J
Benz(a)anthracene	1300	---	5100	5.6	14	5	*,J	J	6.5	14	5.1	*,J	J
Chrysene	1400	---	21000	10	14	5.7	*,J	J	9.5	14	5.8	*,J	J
Benzofluoranthenes (b)				11	14	4.8	*,J	J	13	14	4.8	*,J	J
Benzofluoranthenes (k)				5.6	14	5.6	*,U	UJ	5.6	14	5.6	*,U	UJ
Benzofluoranthenes (b, j ,k)*	3200	---	9900	11				J	13				J
Benzo(a)pyrene	1600	---	3600	5.6	14	5	*,J	J	7.2	14	5.1	*,J	J
Indeno(1,2,3-c,d)pyrene	600	---	4400	5.5	14	4.5	*,J	J	5.9	14	4.5	*,J	J
Dibenz(a,h)anthracene	230	---	1900	4.2	14	4.2	*,U	UJ	4.2	14	4.2	*,U	UJ
Benzo(g,h,i)perylene	670	---	3200	5.2	14	5.2	*,U	UJ	6.3	14	5.2	*,J	J
Total HPAH	12000	---	69000	85.7				J	80.4				J
CHLORINATED HYDROCARBONS (µg/kg dry weight)													
1,4-Dichlorobenzene	110	---	120	3.5	14	3.5	*,U	UJ	3.5	14	3.5	*,U	UJ
1,2-Dichlorobenzene	35	---	110	3.4	14	3.4	*,U	UJ	3.4	14	3.4	*,U	UJ
1,2,4-Trichlorobenzene	31	---	64	3.7	14	3.7	*,U	UJ	3.7	14	3.7	*,U	UJ
Hexachlorobenzene (HCB)	22	168	230	4.6	14	4.6	*,U	UJ	4.6	14	4.6	*,U	UJ
PHTHALATES (µg/kg dry weight)													
Dimethyl phthalate	71	---	1400	5.6	14	5.6	*,U	UJ	5.6	14	5.6	*,U	UJ
Diethyl phthalate	200	---	1200	5.2	14	5.2	*,U	UJ	5.2	14	5.2	*,U	UJ
Di-n-butyl phthalate	1400	---	5100	7.3	28	6.7	*,J	J	7	28	6.7	*,J	J
Butyl benzyl phthalate	63	---	970	5.2	14	5.2	*,U	UJ	5.2	14	5.2	*,U	UJ
Bis(2-ethylhexyl) phthalate	1300	---	8300	33	140	13	*,J	J	29	140	13	*,J	J
Di-n-octyl phthalate	6200	---	6200	4.5	14	4.5	*,U	UJ	4.5	14	4.5	*,U	UJ
PHENOLS (µg/kg dry weight)													
Phenol	420	---	1200	5.1	42	4.3	*,J	J	4.6	42	4.4	*,J	J
2-Methylphenol	63	---	77	5.7	14	5.7	*,U	UJ	5.8	14	5.8	*,U	UJ
4-Methylphenol	670	---	3600	6.8	28	6.3	*,J	J	6.3	28	6.3	*,U	UJ
2,4-Dimethylphenol	29	---	210	8.8	69	8.8	*,U	UJ	8.8	70	8.8	*,U	UJ
Pentachlorophenol	400	504	690	7.4	140	7.4	*,U	R	7.4	140	7.4	*,U	R

Parameter	DMMP Marine Guidelines			DMMU-07					DMMU-08				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter
MISCELLANEOUS EXTRACTABLES (µg/kg dry weight)													
Benzyl alcohol	57	---	870	6.8	28	6.8	*,U	UJ	6.9	28	6.9	*,U	UJ
Benzoic acid	650	---	760	140	550	140	*,U	UJ	140	560	140	*,U	UJ
Dibenzofuran	540	---	1700	4.8	14	4.8	*,U	UJ	4.8	14	4.8	*,U	UJ
Hexachlorobutadiene	11	---	270	4.2	14	4.2	*,U	UJ	4.2	14	4.2	*,U	UJ
N-Nitrosodiphenylamine	28	---	130	4.5	14	4.5	*,U	UJ	4.5	14	4.5	*,U	UJ
PESTICIDES & PCBs (µg/kg dry weight)													
4,4’-DDD	16	---	---	0.173	0.1	0.1			0.282	0.1	0.1		
4,4’-DDE	9	---	---	0.135	0.1	0.1			0.128	0.1	0.1		
4,4’-DDT	12	---	---	0.781	0.1	0.1			0.1	0.1	0.1	U	UJ
sum of 4,4’-DDD, 4,4’-DDE, 4,4’-DDT	---	50	69	1.089					0.41				UJ
Aldrin	9.5	---	---	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
cis-Chlordane				0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
cis-Nonachlor				0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
Oxychlordane				0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
trans-Chlordane				0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
trans-Nonachlor				0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
Total Chlordane (sum of cis-chlordane, trans- chlordane, cis-nonachlor, trans- nonachlor, oxychlordane)	2.8	37	---	0.1				U	0.1				U
Dieldrin	1.9	---	1700	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
Heptachlor	1.5	---	270	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
PCB-aroclor 1016				0.69	2.8	0.69	U	U	0.7	2.8	0.7	U	U
PCB-aroclor 1221				0.69	2.8	0.69	U	U	0.7	2.8	0.7	U	U
PCB-aroclor 1232				0.69	2.8	0.69	U	U	0.7	2.8	0.7	U	U
PCB-aroclor 1242				1.8	2.8	0.69	J	J	1.2	2.8	0.7	JP	NJ
PCB-aroclor 1248				0.69	2.8	0.69	U	U	0.7	2.8	0.7	U	U
PCB-aroclor 1254				2.6	2.8	0.69	J	J	2.3	2.8	0.7	J	J
PCB-aroclor 1260				1.6	2.8	0.69	J	J	1.5	2.8	0.7	J	J
Total PCBs (Aroclors)	130	38[(1)]	3100	6				J	5				NJ

Parameter	DMMP Marine Guidelines			DMMU-07					DMMU-08				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter
DIOXINS/FURANS (ng/kg dry weight)													
2,3,7,8-TCDD				0.931	0.931	0.931	U	UJ	0.702	0.702	0.702	U	UJ
1,2,3,7,8-PECDD				0.312	2.48	0.312	U	UJ	0.22	2.45	0.22	U	UJ
1,2,3,4,7,8,-HxCDD				0.267	2.48	0.267	U	UJ	0.2	2.45	0.2	U	UJ
1,2,3,6,7,8-HxCDD				0.239	2.48	0.239	U	UJ	0.184	2.45	0.184	U	UJ
1,2,3,7,8,9-HxCDD				0.297	2.48	0.253	JK	UJ	0.192	2.45	0.192	U	UJ
1,2,3,4,6,7,8,-HpCDD				6.88	2.48	0.344		J	2.66	2.45	0.127		J
OCDD				51.1	4.97	0.464		J	19.9	4.91	0.415		J
2,3,7,8-TCDF				0.872	0.872	0.872	U	UJ	0.659	0.659	0.659	U	UJ
1,2,3,7.8.-PeCDF				0.498	2.48	0.498	U	UJ	0.432	2.45	0.432	U	UJ
2,3,4,7,8-PECDF				0.513	2.48	0.513	U	UJ	0.44	2.45	0.44	U	UJ
1,2,3,4,7,8-HXCDF				0.159	2.48	0.159	U	UJ	0.0258	2.45	0.0258	U	UJ
1,2,3,6,7,8-HxCDF				0.182	2.48	0.182	U	UJ	0.0297	2.45	0.0297	U	UJ
1,2,3,7,8,9-HxCDF				0.22	2.48	0.22	U	UJ	0.0381	2.45	0.0381	U	UJ
2,3,4,6,7,8-HxCDF				0.151	2.48	0.151	U	UJ	0.0245	2.45	0.0245	U	UJ
1,2,3,4,6,7,8-HpCDF				1.23	2.48	0.193	J	J	0.597	2.45	0.0474	BJK	UJ
1,2,3,4,7,8,9-HpCDF				0.179	2.48	0.179	U	UJ	0.0565	2.45	0.0476	BJK	UJ
OCDF				4.33	4.97	0.751	BJK	UJ	2.5	4.91	0.592	BJ	J
Total Tetra-Dioxins				0.931	0.931	0.931	U	UJ	0.702	0.702	0.702	U	UJ
Total Penta-Dioxins				0.312	2.48	0.312	U	UJ	0.22	2.45	0.22	U	UJ
Total Hexa-Dioxins				0.252	2.48	0.252	U	UJ	0.603	2.45	0.192	J	J
Total Hepta-Dioxins				18	2.48	0.344		J	7.41	2.45	0.127		J
Total Tetra-Furans				0.872	0.872	0.872	U	UJ	0.659	0.659	0.659	U	UJ
Total Penta-Furans				0.505	2.48	0.505	U	UJ	0.435	2.45	0.435	U	UJ
Total Hexa-Furans				0.738	2.48	0.175	J	J	0.154	2.45	0.0288	J	J
Total Hepta-Furans				4.63	2.48	0.185		J	1.38	2.45	0.0475	J	J
Dioxin/Furan TEQ (ng/Kg) (TEC*ND EDL *0.5)	---	10	---	0.923					0.638				

(1) This value is normalized to TOC and expressed in mg/kg carbon

Shaded cells Pentachlorophenol data rejected during data validation

Table 9. DMMU-03 Individual Sample Pesticide Analysis

Parameter	DMMP Marine Guidelines			DW22-SB-03-01					DW22-SB-03-02				
	SL	BT	ML	Result	RL	MDL	Qualifier		Result	RL	MDL	Qualifier	
							Lab	Inter				Lab	Inter
PESTICIDES & PCBs (µg/kg dry weight)													
4,4'-DDD	16	---	---	0.948	0.1	0.1			1.227	0.1	0.1		
4,4'-DDE	9	---	---	0.638	0.1	0.1			0.502	0.1	0.1		
4,4'-DDT	12	---	---	1.079	0.1	0.1			0.282	0.1	0.1		
sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT	---	50	69	2.665					2.011				
Aldrin	9.5	---	---	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
cis-Chlordane				0.205	0.1	0.1			0.166	0.1	0.1		
cis-Nonachlor				0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
Oxychlordane				0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U
trans-Chlordane				0.221	0.1	0.1			0.262	0.1	0.1		
trans-Nonachlor				0.245	0.1	0.1			0.195	0.1	0.1		
Total Chlordane (sum of cis-chlordane, trans- chlordane, cis-nonachlor, trans- nonachlor, oxychlordane)	2.8	37	---	0.671					0.623				
Dieldrin	1.9	---	1700	0.126	0.1	0.1			0.126	0.1	0.1		
Heptachlor	1.5	---	270	0.1	0.1	0.1	U	U	0.1	0.1	0.1	U	U

Table 10. Toxic Equivalency Calculations

Sample ID		DMMU-01			DMMU-02			DMMU-03			DMMU-04		
Analyte	TEF	Result	TEC *nd EDL *0	TEC *nd EDL *0.5	Result	TEC *nd EDL *0	TEC *nd EDL *0.5	Result	TEC *nd EDL *0	TEC *nd EDL *0.5	Result	TEC *nd EDL *0	TEC *nd EDL *0.5
2,3,7,8-TCDD (ng/Kg)	1	0.459	0	0.2295	0.786	0	0.393	0.635	0	0.3175	0.541	0	0.2705
1,2,3,7,8-PeCDD (ng/Kg)	1	0.162	0	0.081	0.266	0	0.133	0.235	0	0.1175	0.219	0	0.1095
1,2,3,4,7,8-HxCDD (ng/Kg)	0.1	0.13	0	0.0065	0.369	0	0.01845	0.319	0	0.01595	0.138	0	0.0069
1,2,3,6,7,8-HxCDD (ng/Kg)	0.1	0.0265	0	0.001325	0.361	0	0.01805	0.492	0	0.0246	0.129	0	0.00645
1,2,3,7,8,9-HxCDD (ng/Kg)	0.1	0.185	0.0185	0.0185	0.365	0	0.01825	0.31	0	0.0155	0.295	0	0.01475
1,2,3,4,6,7,8-HpCDD (ng/Kg)	0.01	3	0.03	0.03	3.95	0.0395	0.0395	7.33	0.0733	0.0733	8.37	0.0837	0.0837
OCDD (ng/Kg)	0.0003	29	0.0087	0.0087	41.6	0.01248	0.01248	71.6	0.02148	0.02148	68.9	0.02067	0.02067
2.3.7.8-TCDF (ng/Kg)	0.1	0.498	0	0.0249	0.869	0	0.04345	0.59	0	0.0295	0.561	0	0.02805
1,2,3,7,8-PeCDF (ng/Kg)	0.03	0.317	0	0.004755	0.614	0	0.00921	0.463	0	0.006945	0.361	0	0.005415
2,3,4,7,8-PeCDF (ng/Kg)	0.3	0.308	0	0.0462	0.61	0	0.0915	0.478	0	0.0717	0.362	0	0.0543
1,2,3,4,7,8-HxCDF (ng/Kg)	0.1	0.184	0	0.0092	0.124	0	0.0062	0.313	0	0.01565	0.153	0	0.00765
1,2,3,6,7,8-HxCDF (ng/Kg)	0.1	0.101	0	0.00505	0.138	0	0.0069	0.0713	0	0.003565	0.0797	0	0.003985
1,2,3,7,8,9-HxCDF (ng/Kg)	0.1	0.239	0	0.01195	0.17	0	0.0085	0.0977	0	0.004885	0.106	0	0.0053
2,3,4,6,7,8-HxCDF (ng/Kg)	0.1	0.0172	0	0.00086	0.21	0	0.0105	0.185	0	0.00925	0.0713	0	0.003565
1,2,3,4,6,7,8-HpCDF (ng/Kg)	0.01	0.524	0	0.00262	1.12	0.0112	0.0112	1.63	0.0163	0.0163	1.84	0	0.0092
1,2,3,4,7,8,9-HpCDF (ng/Kg)	0.01	0.079	0	0.000395	0.0993	0	0.000497	0.127	0	0.000635	0.261	0	0.001305
OCDF (ng/Kg)	0.0003	2.57	0.000771	0.000771	3.61	0.001083	0.001083	5.12	0.001536	0.001536	9.54	0.002862	0.002862
Dioxin/Furan TEQ (ng/Kg)			0.058	0.482		0.064	0.822		0.113	0.746		0.107	0.634

Shaded cells indicate non-detect value based on validation qualifier

Table 10. Toxic Equivalency Calculations (Continued)

Sample ID		DMMU-05			DMMU-06			DMMU-07			DMMU-08		
Analyte	TEF	Result	TEC *nd EDL *0	TEC *nd EDL *0.5	Result	TEC *nd EDL *0	TEC *nd EDL *0.5	Result	TEC *nd EDL *0	TEC *nd EDL *0.5	Result	TEC *nd EDL *0	TEC *nd EDL *0.5
2,3,7,8-TCDD (ng/Kg)	1	0.196	0	0.098	0.534	0	0.267	0.931	0	0.4655	0.702	0	0.351
1,2,3,7,8-PeCDD (ng/Kg)	1	0.163	0.163	0.163	0.255	0	0.1275	0.312	0	0.156	0.22	0	0.11
1,2,3,4,7,8-HxCDD (ng/Kg)	0.1	0.394	0	0.0197	0.218	0	0.0109	0.267	0	0.01335	0.2	0	0.01
1,2,3,6,7,8-HxCDD (ng/Kg)	0.1	0.292	0	0.0146	0.469	0	0.02345	0.239	0	0.01195	0.184	0	0.0092
1,2,3,7,8,9-HxCDD (ng/Kg)	0.1	0.167	0.0167	0.0167	0.278	0	0.0139	0.297	0	0.01485	0.192	0	0.0096
1,2,3,4,6,7,8-HpCDD (ng/Kg)	0.01	11	0.11	0.11	30.4	0.304	0.304	6.88	0.0688	0.0688	2.66	0.0266	0.0266
OCDD (ng/Kg)	0.0003	86.8	0.02604	0.02604	357	0.1071	0.1071	51.1	0.01533	0.01533	19.9	0.00597	0.00597
2.3.7.8-TCDF (ng/Kg)	0.1	0.0645	0	0.003225	0.507	0	0.02535	0.872	0	0.0436	0.659	0	0.03295
1,2,3,7,8-PeCDF (ng/Kg)	0.03	0.126	0	0.00189	0.279	0	0.004185	0.498	0	0.00747	0.432	0	0.00648
2,3,4,7,8-PeCDF (ng/Kg)	0.3	0.0719	0	0.010785	0.281	0	0.04215	0.513	0	0.07695	0.44	0	0.066
1,2,3,4,7,8-HxCDF (ng/Kg)	0.1	0.157	0	0.00785	0.14	0	0.007	0.159	0	0.00795	0.0258	0	0.00129
1,2,3,6,7,8-HxCDF (ng/Kg)	0.1	0.146	0.0146	0.0146	0.13	0	0.0065	0.182	0	0.0091	0.0297	0	0.001485
1,2,3,7,8,9-HxCDF (ng/Kg)	0.1	0.16	0	0.008	0.161	0	0.00805	0.22	0	0.011	0.0381	0	0.001905
2,3,4,6,7,8-HxCDF (ng/Kg)	0.1	0.163	0.0163	0.0163	0.111	0	0.00555	0.151	0	0.00755	0.0245	0	0.001225
1,2,3,4,6,7,8-HpCDF (ng/Kg)	0.01	1.21	0	0.00605	10.4	0.104	0.104	1.23	0.0123	0.0123	0.597	0	0.002985
1,2,3,4,7,8,9-HpCDF (ng/Kg)	0.01	0.26	0	0.0013	0.283	0	0.001415	0.179	0	0.000895	0.0565	0	0.000283
OCDF (ng/Kg)	0.0003	6.5	0.00195	0.00195	51.8	0.01554	0.01554	4.33	0	0.00065	2.5	0.00075	0.00075
Dioxin/Furan TEQ (ng/Kg)			0.349	0.520		0.531	1.074		0.096	0.923		0.033	0.638

Shaded cells indicate non-detect value based on validation qualifier

FIGURES

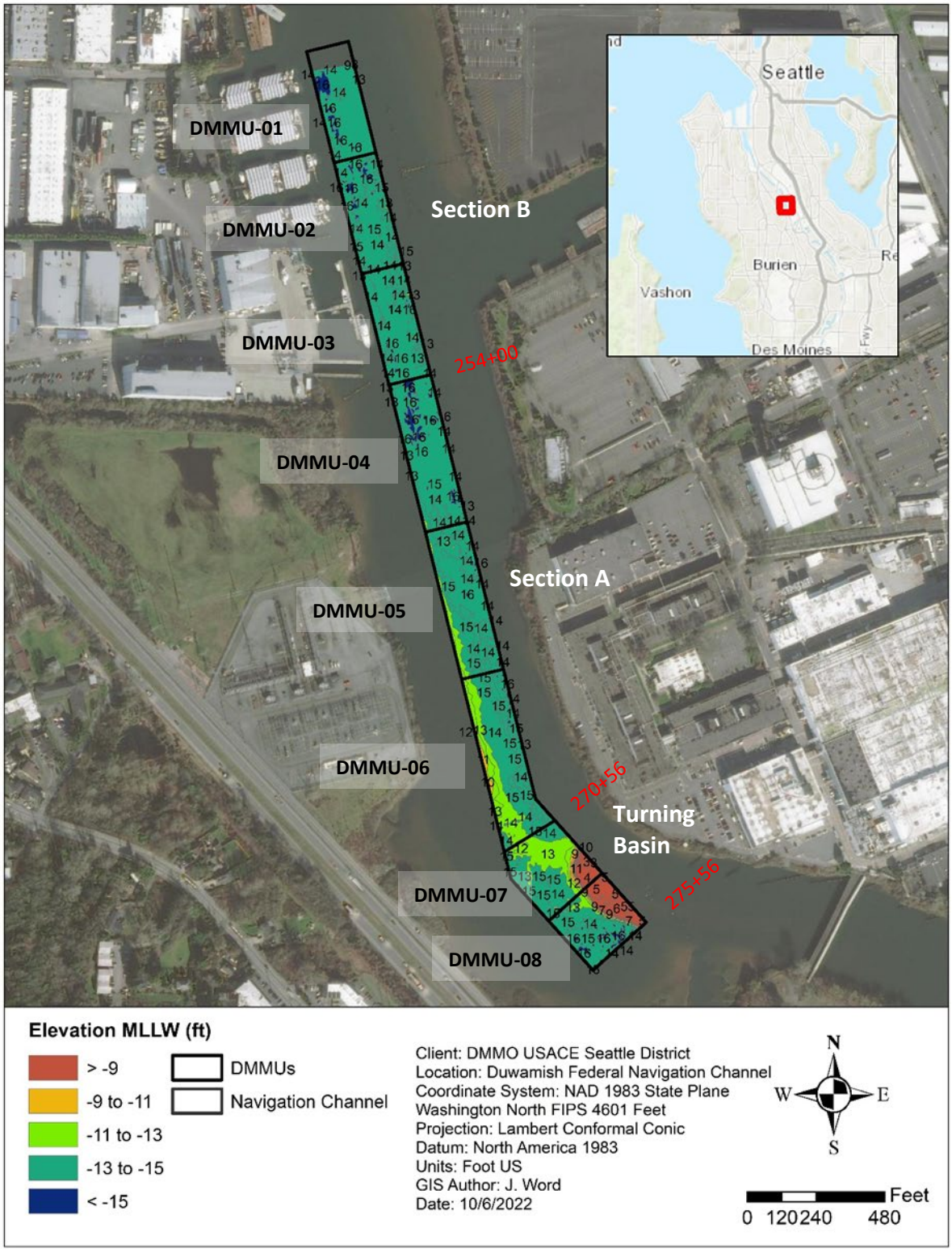

Figure 1. Duwamish Waterway Proposed Dredge Area

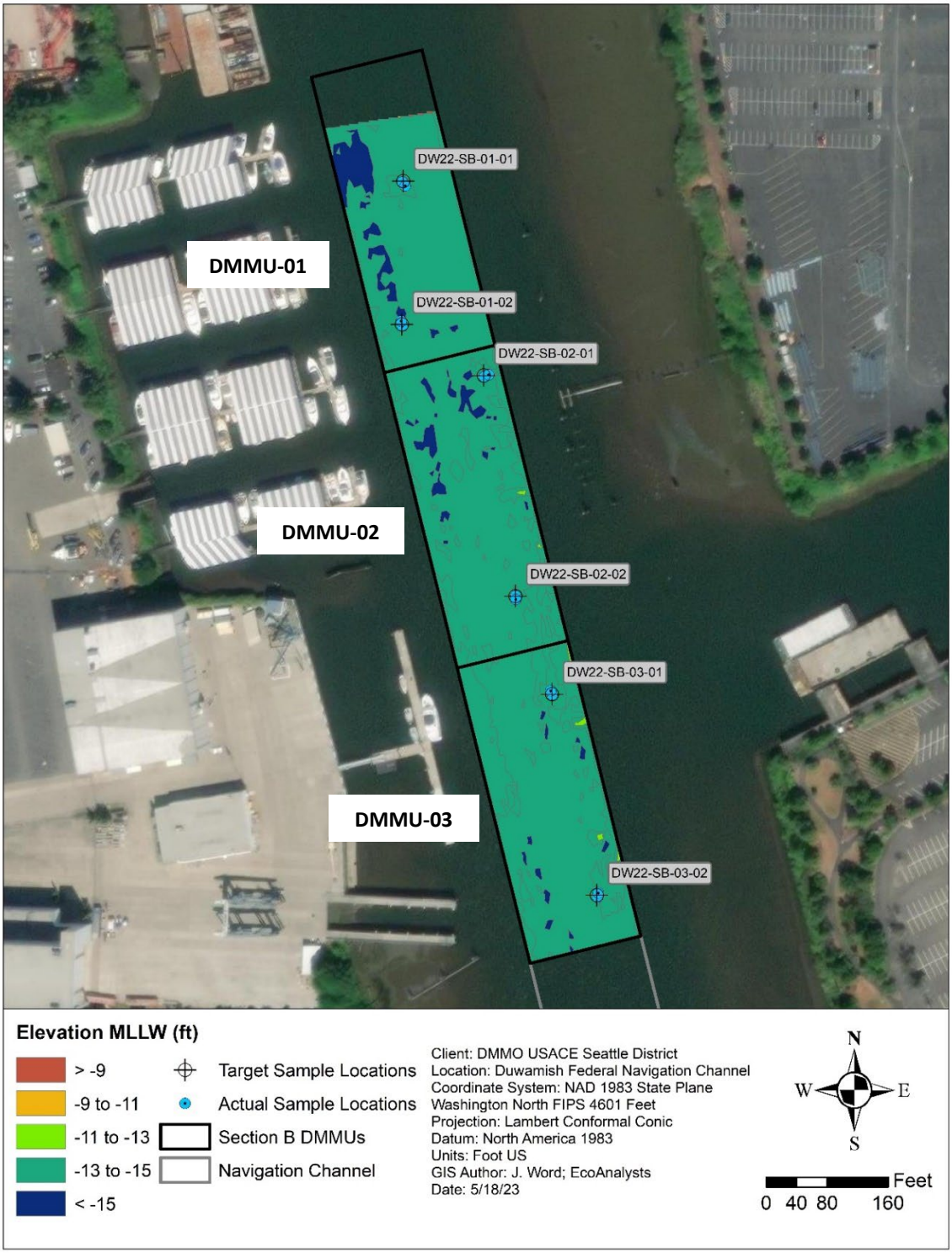

Figure 2. Target and Actual Sampling Locations Section B

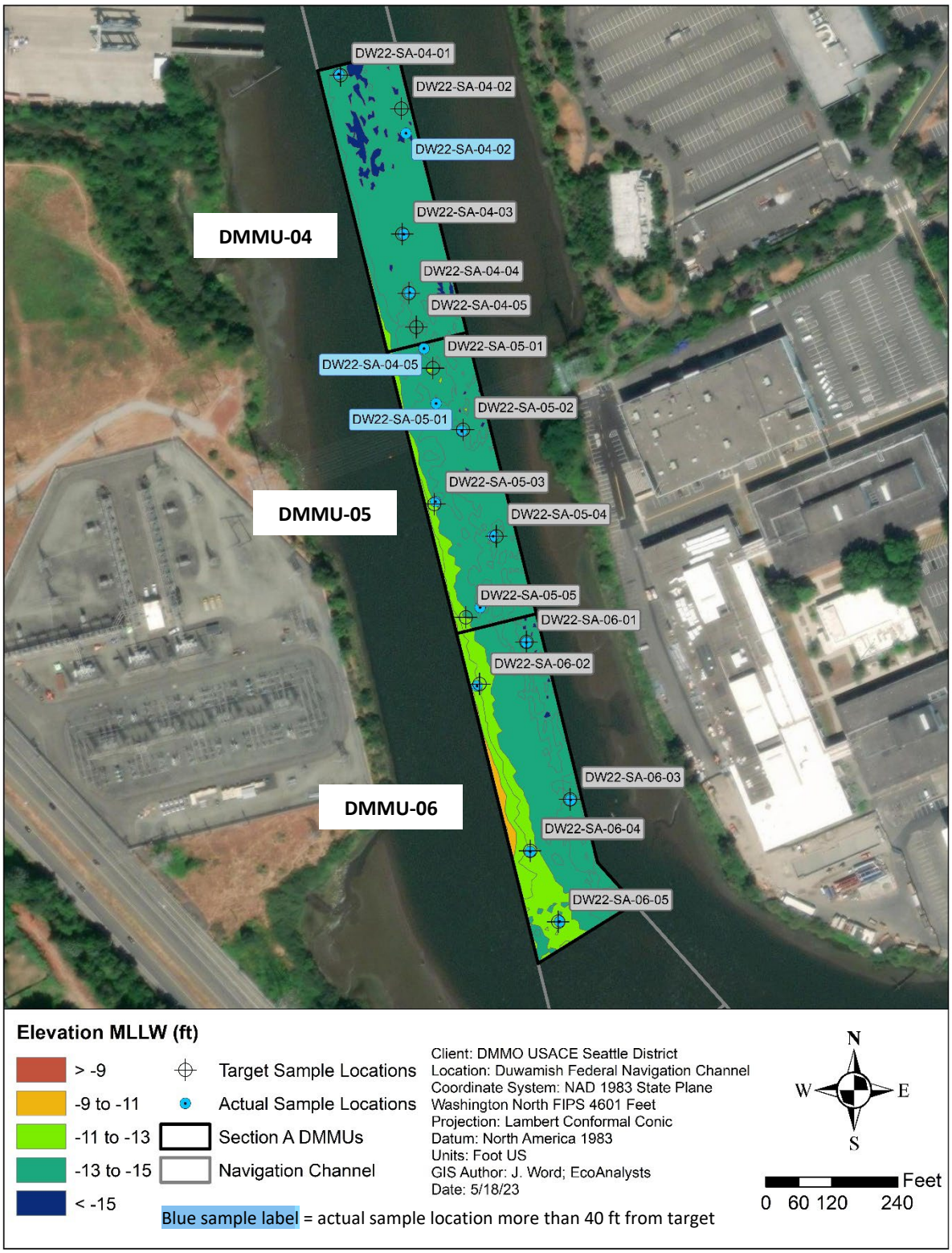

Figure 3. Target and Actual Sampling Locations Section A

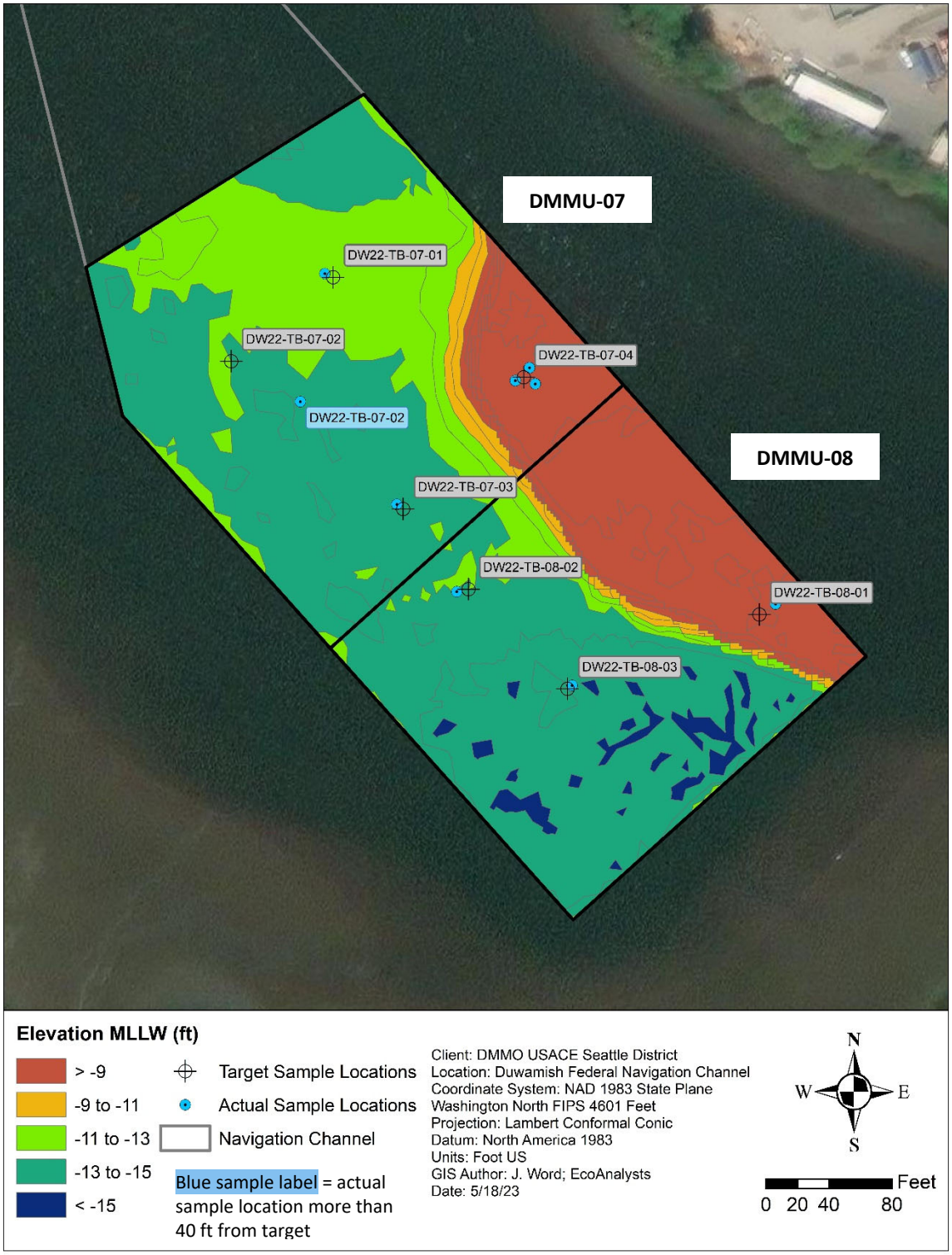

Figure 4. Target and Actual Sampling Locations Turning Basin