

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

Memorandum for Record

December 1, 2025

Subject: Suitability Determination Memorandum for the Meydenbauer Bay Yacht Club in Bellevue, Washington (Permit Number Pending).

Introduction

This suitability determination memorandum (SDM) documents the consensus regarding the suitability of the proposed dredged material for unconfined aquatic disposal as determined by the Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Washington Departments of Ecology and Natural Resources, and the U.S. Environmental Protection Agency).

Project Description

The project is located in Whalers Cove of Meydenbauer Bay in Bellevue, Washington, which connects to Lake Washington (Figure 1). Meydenbauer Bay Yacht Club (MBYC) is a marina along the shoreline at this location. Sediment has accumulated within the MBYC and is interfering with safe passage and moorage of vessels, and associated aisleways around the property. The proposed dredging would target a depth elevation of +13.5 ft USACE Lake Washington Datum (COE), with an additional 2-feet of over dredge (+11.5 ft COE). The sampling design also included a Z-sample to facilitate antidegradation evaluation that represented material from +11.5 to +9.5 ft COE.

This characterization was conducted in February 2023 under the DMMP guidelines to determine the appropriate dredge material disposal methods. Based on the 2023 sampling, the MBYC was listed as a cleanup site under the Model Toxics Control Act (MTCA) by the State of Washington Department of Ecology Toxic Cleanup Program in 2024. Analytical results and management recommendations for the dredge materials are summarized below.

Project Summary

Waterbody	Meydenbauer Bay, Lake Washington
Water classification	Freshwater
Project rank (see Ranking Determination)	High
Total proposed dredging volume (cy)	18,500
Target proposed dredging depth	+13.5 COE
Max. proposed dredging depth (includes 2-ft overdepth allowance)	+11.5 COE
Proposed disposal location(s)	Elliott Bay
Dredged Material Management Units (DMMUs): No. of stations	3 Surface DMMUs: DMMU1: 3 cores; DMMU2: 3 cores; DMMU3: 1 core
EIM Study ID	MBYC23
USACE Regulatory Number	Pending
Sampling and Analysis Plan (SAP) Approval Date	February 2023 (Anchor QEA, 2023)
Sampling Date(s)	September 18-19, 2023
Testing Parameters	DMMP Marine COCs plus dioxin/furans
Biological Testing	Screening levels triggered but project proponent did not pursue bioassays or bioaccumulation.
Sediment Characterization Report Approval Date	November 14, 2025 (Anchor QEA, 2025)
Suitability Outcome	All DMMUs were unsuitable for in-water disposal
Recency Expiration Date (high = 3 years)	September 2026
Antidegradation Assessment	Placement of a clean sand cover required for DMMU-1

Sampling and Analysis Description

Sediment cores were collected by vibracore on September 18 and 19, 2023, aboard a contracted sampling vessel provided by Gravity Marine Services. Mudline elevation at each sampling location was measured using a lead line, depth sounder, and real time kinematic (RTK) positioning. Figure 2 shows the sediment sampling locations. Table 1 lists the sampling station and recovery details for the sampling effort.

A total of seven cores were collected to represent three DMMUs. DMMU-1 and -2 had three cores each, and DMMU-3 was represented by one core (Figure 2). During the collection, a second coring attempt was required at stations C-3, C-6, and C-7 due to poor recovery on the first attempts. A third and fourth coring attempt was required at stations C-2 and C-1, respectively. All accepted cores were above the DMMP's 75% recovery threshold (Table 1). After collection, sediment cores were transferred to a shore-based processing team for compositing and sample preparation. Cores were separated into the primary DMMU (mudline to +11.5 COE) and a Z-layer sample (+11.5 to +9.5 COE).

Samples were submitted to Analytical Resources in Tukwila, Washington for chemical and physical analysis. Analyses were performed by Analytical Resources and AmTest Laboratories in Kirkland, Washington.

Data Validation

Data validation was conducted in accordance with USEPA Stage 2B validation guidelines on the DMMUs and the Z-layer analyses. All validations were performed by Laboratory Data Consultants, Inc. The validation process resulted in some additional J and UJ qualified data beyond those assigned by the laboratory, based on specified protocol or technical advisory. In cases where more than one result reported by the laboratory (i.e., dilutions), the data validator selected the more technically acceptable result. Completeness was 100% and all data was considered useable as reported or as qualified, by the data validator.

Analytical Testing Results

Results are reported in the sediment characterization report (Anchor QEA, 2025). Sediment conventional results show that the material was classified as silty sand or sandy silt with total fines ranging from 36 to 62%. Total organic carbon ranged from 13 to 17.4%. Total sulfides were evaluated with a range of 96.3 to 193 mg/kg.

Table 2 summarizes the analytical results for the three DMMUs alongside the DMMP marine guidelines, with discrete cores displayed in Table 3. Z-samples are reported in Table 4 and compared to the Washington State Management Standards (SMS) freshwater requirements. Marine guideline comparisons are for determining suitability for disposal at a DMMP open water disposal site, while freshwater SMS comparisons are required for sediments left in place in the lake (antidegradation). Exceedances of the DMMP screening level (SL) and/or bioaccumulation trigger (BT) exceedances occurred for all DMMUs. Two Z-samples had SMS sediment cleanup objectives (SCO) and/or cleanup screening level (CSL) exceedances. One DMMU also had a maximum level (ML) exceedance (DMMU 3; benzo(a)pyrene). All exceedances are discussed below.

Metals. Total mercury was above the SL in DMMU 1, and zinc was above the SL in DMMU 1 and 3. All other metals were below the SLs and there were no exceedances in the Z-samples.

PAHs. A majority of the PAH analytes had a DMMP SL exceedance. Total HPAHs was above the SL for all three DMMUs with a range of 24,000 µg/kg to 41,200 µg/kg and total LPAH exceeded the SL in DMMU 3. Fluoranthene was above the DMMP BT in all DMMUs, and benzo(a)pyrene exceeded the ML in DMMU 3. The Z-sample for DMMU 1 had an SMS SCO exceedance for Total PAHs.

SVOCs. Screening level exceedances of bis(2-ethylhexyl)phthalate and butylbenzyl phthalate were detected in all three DMMUs. DMMU-1-Z had an SMS SCO exceedance for bis(2-ethylhexyl)phthalate. All other analytes were below SLs.

PCB Aroclors. Total PCB Aroclors is the summation of seven PCBs. Exceedances of the SL were detected in all DMMUs. DMMU-1-Z and the initial run of DMMU-2-Z also had total PCB Aroclors SCO exceedances. DMMU-2-Z was reanalyzed without DMMP coordination; the two results were averaged, and the value was below the SMS SCO (see table below).

Analyte	SMS SCO	DU-2Z-20230919	
		Initial Analysis	Reanalysis
Total PCB Aroclors (µg/kg)	110	112 J	16.8
Total PCB Aroclors Average (µg/kg)	110	64.4	

Notes:

Above SCO

Dioxins/furans. D/F Congeners were evaluated due to being a chemical of concern for the project area. All three DMMUs exceeded the bioaccumulation trigger of 10 ng/kg TEQ ranging from 26 to 51.8 ng/kg TEQ (ND=1/2), see Table 2. Discrete cores were analyzed and are summarized in Table 3. The Z-sample from an individual core (C-3) within DMMU 1 had an elevated concentration of 95 ng/kg TEQ (Table 4).

Biological Results

Bioassay and/or bioaccumulation testing was not pursued by the proponent.

DMMP Determinations

Suitability Determination

Sediment from the MBYC has metals, PAHs, SVOCs, pesticides, PCB Aroclors, and dioxin/furan congeners that exceed DMMP guidelines and therefore, all 18,500 cy are considered unsuitable for open-water disposal. The project proponent proposed upland disposal in the data report (Anchor QEA, 2025).

Ranking Determination

For this characterization, the DMMP ranked this project “moderate” per guidelines in the DMMP User Manual (DMMP, 2021). Project rankings “represent a best professional judgement of concern of potential risk by the agencies, typically based on a scale of potential for adverse biological effects of elevated concentrations of chemical concern” as outlined in Table 5-1 in the 2021 DMMP User Manual.

Per the table mentioned above, three of the criteria for a “high” rank are many known chemical sources, high concentrations of chemicals of concern, and within a MTCA cleanup site. Since this site satisfies three of these criteria, this project will be ranked “high” for the next round of testing.

Antidegradation Determination

The sediment to be exposed by dredging must meet the State of Washington's Antidegradation Policy (Ecology, 2013) as outlined by DMMP guidance (DMMP, 2021). The Z-layer samples were compared to the Washington State Sediment Management Standards (SMS) freshwater requirements as the site is located in Lake Washington.

The leave surface for DMMU-3 did not have any SMS exceedances. The analysis of DMMU-2-Z illustrated a decrease in concentration with depth, in all COCs, when compared to the DMMU-2 surface material. Additionally, the average total PCB Aroclors was below SMS SCO (see previous section). The DMMP agencies accept the average concentration for total PCB Aroclors which passes antidegradation standards. The leave surface in DMMU-1 has SMS SCO exceedances and a CSL exceedance (see table below), not passing the state antidegradation evaluation.

Analyte (µg/kg)	SMS Freshwater		DU-1Z-20230919
	SCO	CSL	
bis(2-ethylhexyl)phthalate	500	22,000	6,840
Total PAHs	17,000	30,000	26,800 J
Total PCBs Aroclors	110	2,500	672 J
Total DDE	21	33	42.3 J
Dioxin/Furan Congeners (ng/kg) (ND=1/2)	-	-	42.4

Notes:

Above SCO

Above CSL

To meet antidegradation in DMMU-1, a minimum of a 9-inch clean sand cover layer must be placed after dredging is complete. On the southeastern portion of the site, a horizontal buffer of 30' must be added to the border of DMMU-1 to address the data gap between C-3 and C-7. Post-dredge and post-sand cover placement surveys must be provided to USACE Regulatory and the DMMP agencies to verify post-construction antidegradation compliance.

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.

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.

Hydraulically - dredged material may not be placed at non-dispersive sites.

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.

References

Anchor QEA, Inc., 2023. *Sampling and Analysis Plan. Maintenance Dredging Evaluation, Meydenbauer Bay Yacht Club*. Prepared for Meydenbauer Bay Yacht Club, February 2023.

Anchor QEA, Inc., 2025. *Sediment Characterization Report for Proposed Maintenance Dredging, Meydenbauer Bay Yacht Club*. Prepared for Meydenbauer Bay Yacht Club, September 2025.

Dredged Material Management Program, 2021. *Dredged Material Evaluation and Disposal Procedures User Manual*. Dredged Material Management Office, U.S. Army Corps of Engineers, Seattle District.

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

Agency Signatures

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

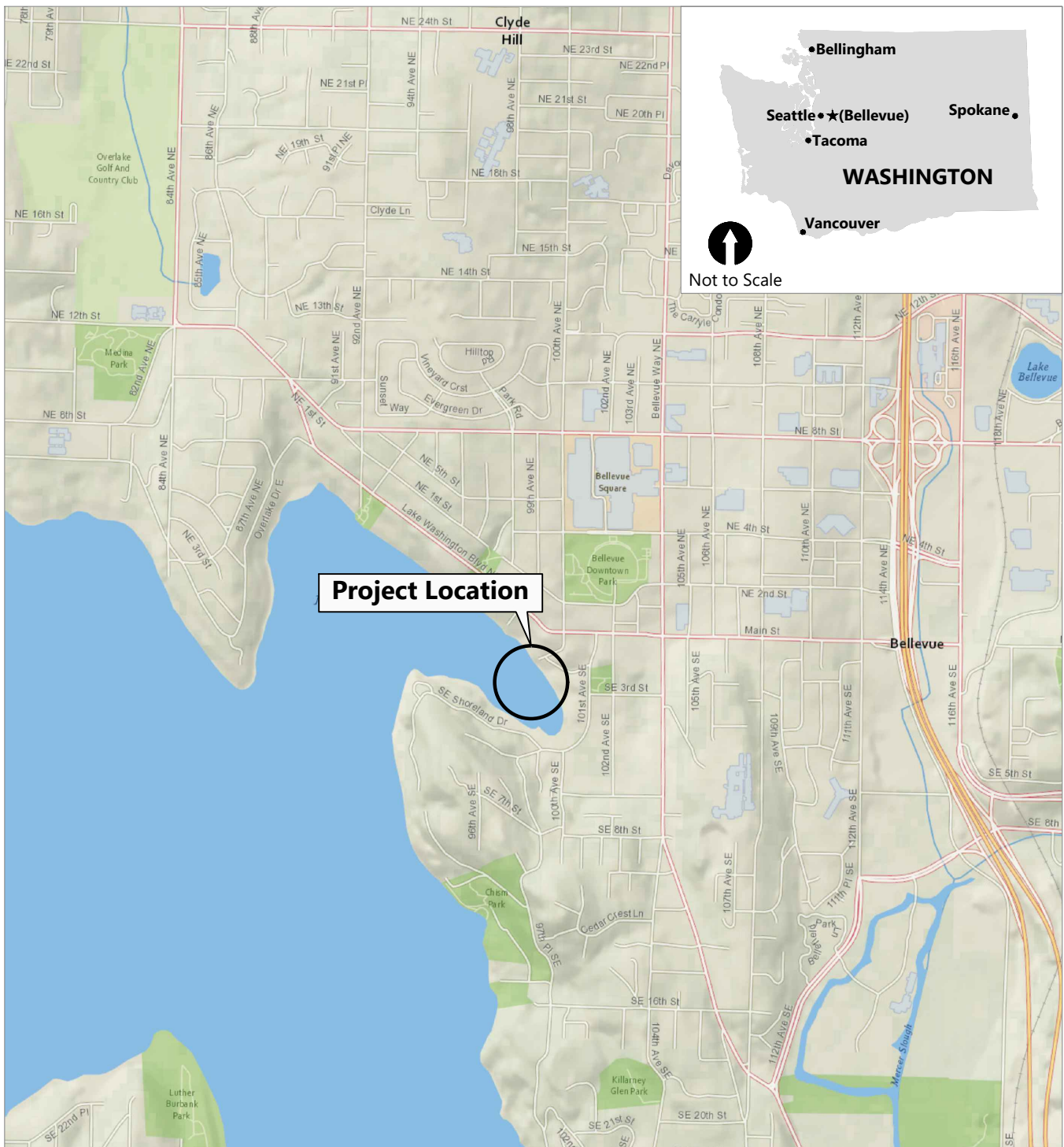
_____	_____
Date	Sarah Benson – U.S. Army Corps of Engineers, Seattle District

_____	_____
Date	Whitney Conard, PhD. – U.S. Environmental Protection Agency, Region 10

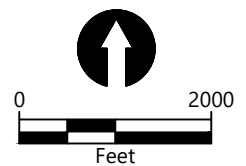
_____	_____
Date	Laura Inouye, PhD. – Washington State Department of Ecology

_____	_____
Date	Shannon Soto – Washington State Department of Natural Resources

Copies Furnished:
DMMP agencies
Shane Shelburne, USACE Regulatory Project Manager
Katy Gross, Anchor QEA
DMMO File



SOURCE: National Geographic World Map - National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.
HORIZONTAL DATUM: Washington State Plane North Zone, NAD83, U.S. Survey Feet



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 Filepath: K:\Projects\2595-Meydenbauer Yacht Club\MBYC Maintenance Dredging Eval\Sediment Characterization Report\2595-RP-001 (Vicinity Map).dwg Figure 1



Figure 1
Vicinity Map
 Sediment Characterization Report
 MBYC Maintenance Dredging Evaluation



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Filepath: K:\Projects\2595-Meydenbauer Yacht Club\MBYC Maintenance Dredging Eval\Sediment Characterization Report\2595-RP-002 (Proposed and Actual Sampling Locations).dwg Figure 2



Figure 2
Proposed and Actual Sampling Locations
Sediment Characterization Report
MBYC Maintenance Dredging Evaluation

Table 1
Core Collection Data

Station ID	Attempts	Accepted Attempt Number	Date Collected	Location		Water Depth (feet)	Observed Water Level (feet)	Mudline Elevation (feet)	Recovery (feet)	Drive Penetration (feet)	Core Recovery (percent)
				Easting	Northing						
C-1	4	4	9/19/23	122.20914	47.60854	6.9	20	13.1	4.25	5	85
C-2	3	3	9/19/23	122.20875	47.60813	7.1	20	12.9	4.7	5	94
C-3	2	2	9/19/23	122.20796	47.60781	5.5	20	14.5	5.2	6	86
C-4	1	1	9/19/23	122.20859	47.60904	5.7	20	14.3	5.8	6	97
C-5	1	1	9/19/23	122.20800	47.60881	7	20	13.0	4.5	5	90
C-6	2	2	9/19/23	122.20766	47.60841	7.4	20	12.6	5.6	5	112
C-7	2	2	9/18/23	122.20744	47.60811	5.7	20	14.3	7	8	88

Notes:
Datum COE

Table 2
Composite Sediment Core Sample Analytical Results Compared to DMMP Criteria

					Task DMMU	MBYC_2023 DMMU-1	MBYC_2023 DMMU-2	MBYC_2023 DMMU-3
					Sample ID	DU-1A-20230919	DU-2A-20230919	DU-3A-20230918
					Sample Date	9/19/2023	9/19/2023	9/18/2023
					Depth	0 - 2 ft	0 - 1.8 ft	0 - 2.8 ft
					Sample Type	N	N	N
					Matrix	SE	SE	SE
DMMP SL2021					DMMP BT2021	DMMP ML2021		
Conventional Parameters (mg/kg)								
Ammonia as nitrogen	SM4500NH3H					83.7	15	16.5
Sulfide	SM4500S2D					193 J	96.3 J	122 J
Conventional Parameters (pct)								
Total organic carbon	SW9060AM					17.4 J	13 J	16.4 J
Total solids	D2216					16.43	22.89	22.56
Total solids	SM2540G					14.04 J	24.37 J	22.99 J
Total volatile solids	PSEP-TV5					27.54 J	22.18 J	23.57 J
Grain Size (pct)								
Gravel	PSEP-PS					12.5	7.8	6
Gravel, very coarse	PSEP-PS					10.9	3.6	3.8
Gravel, coarse	PSEP-PS					0.3	0.8	0.4
Gravel, medium	PSEP-PS					1.3	3.4	1.8
Sand	PSEP-PS					25.5	56.3	34
Sand, very coarse	PSEP-PS					3.2	5	3.1
Sand, coarse	PSEP-PS					3.8	9.8	3.8
Sand, medium	PSEP-PS					5.1	25.1	12.3
Sand, fine	PSEP-PS					5.7	8.8	3.8
Sand, very fine	PSEP-PS					7.7	7.6	11
Silt	PSEP-PS					35.2	29.7	52.3
Silt, coarse	PSEP-PS					9.3	16.1	28.5
Silt, medium	PSEP-PS					11.2	0.1 U	3.1
Silt, fine	PSEP-PS					6.5	8.1	11.4
Silt, very fine	PSEP-PS					8.2	5.5	9.3
Clay	PSEP-PS					26.8	6.3	7.6
Clay, coarse	PSEP-PS					12.3	1.7	2.4
Clay, medium	PSEP-PS					8.1	1	1.1
Clay, fine	PSEP-PS					6.4	3.6	4.1
Metals (mg/kg)								
Antimony	SW6020	150		200		1.4 UJ	0.78 UJ	0.86 UJ
Arsenic	SW6020	57	507.1	700		17.9 J	15.5 J	14.9 J
Cadmium	SW6020	5.1		14		1.9	0.54	1.87
Chromium	SW6020	260				51.7	32.4	42.9
Copper	SW6020	390		1300		127 J	59.3 J	92.9 J
Lead	SW6020	450	975	1200		356	161	369
Mercury	SW7471B	0.41	1.5	2.3		0.438 J	0.132 J	0.361 J

Table 2
Composite Sediment Core Sample Analytical Results Compared to DMMP Criteria

					Task DMMU	MBYC_2023 DMMU-1	MBYC_2023 DMMU-2	MBYC_2023 DMMU-3
					Sample ID	DU-1A-20230919	DU-2A-20230919	DU-3A-20230918
					Sample Date	9/19/2023	9/19/2023	9/18/2023
					Depth	0 - 2 ft	0 - 1.8 ft	0 - 2.8 ft
					Sample Type	N	N	N
					Matrix	SE	SE	SE
DMMPSL2021		DMMPBT2021		DMMPML2021				
Selenium	SW6020		3			3.5 U	1.95 U	2.14 U
Silver	SW6020	6.1		8.4		0.98 J	0.19 J	0.78 J
Zinc	SW6020	410		3800		523	258	473
Volatile Organics (µg/kg)								
Hexachlorobutadiene (Hexachloro-1,3-butadiene)	SW8270ESIM	11		270		20.9 U	15.5 U	14.5 U
Semivolatile Organics (µg/kg)								
1,2,4-Trichlorobenzene	SW8270ESIM	31		64		20.9 U	15.5 U	14.5 U
1,2-Dichlorobenzene	SW8270ESIM	35		110		20.9 U	15.5 U	14.5 U
1,4-Dichlorobenzene	SW8270ESIM	110		120		5.2 J	15.5 U	14.5 U
2,4-Dimethylphenol	SW8270ESIM	29		210		83.5 UJ	62.1 UJ	58 UJ
2-Methylphenol (o-Cresol)	SW8270E	63		77		83.5 UJ	62.1 UJ	58 UJ
4-Methylphenol (p-Cresol)	SW8270E	670		3600		79.8 J	62.1 UJ	58 UJ
Benzoic acid	SW8270E	650		760		182 J	621 UJ	580 UJ
Benzyl alcohol	SW8270E	57		870		83.5 U	62.1 U	58 U
Bis(2-ethylhexyl)phthalate	SW8270E	1300		8300		3080 J	1690 J	4010 J
Butylbenzyl phthalate	SW8270E	63		970		231	78.4	208
Diethyl phthalate	SW8270E	200		1200		209 U	155 U	145 U
Dimethyl phthalate	SW8270E	71		1400		83.5 U	62.1 U	58 U
Di-n-butyl phthalate	SW8270E	1400		5100		52.9 J	62.1 U	75
Di-n-octyl phthalate	SW8270E	6200		6200		80.9 J	68.1 J	58 UJ
Hexachlorobenzene	SW8270ESIM	22	168	230		20.9 U	15.5 U	14.5 U
n-Nitrosodiphenylamine	SW8270ESIM	28		130		20.9 U	15.5 U	14.5 U
Pentachlorophenol	SW8270E	400	504	690		417 U	311 U	290 U
Phenol	SW8270E	420		1200		41.6 J	28.1 J	33.5 J
Polycyclic Aromatic Hydrocarbons (µg/kg)								
1-Methylnaphthalene	SW8270E					83.5 U	24.9 J	44.8 J
2-Methylnaphthalene	SW8270E	670		1900		36 J	40 J	75.1
Acenaphthene	SW8270E	500		2000		323	185	1340
Acenaphthylene	SW8270E	560		1300		36.7 J	27.6 J	38.1 J
Anthracene	SW8270E	960		13000		454	448	912
Benzo(a)anthracene	SW8270E	1300		5100		2250	1860 J	3310
Benzo(a)pyrene	SW8270E	1600		3600		2910	2320 J	4060
Benzo(b,j,k)fluoranthenes	SW8270E					5340	4110	6580
Benzo(g,h,i)perylene	SW8270E	670		3200		1080	1020 J	1240
Carbazole	SW8270E					207	210	331
Chrysene	SW8270E	1400		21000		3710	2930 J	5130

Table 2
Composite Sediment Core Sample Analytical Results Compared to DMMP Criteria

					Task DMMU	MBYC_2023 DMMU-1	MBYC_2023 DMMU-2	MBYC_2023 DMMU-3
					Sample ID	DU-1A-20230919	DU-2A-20230919	DU-3A-20230918
					Sample Date	9/19/2023	9/19/2023	9/18/2023
					Depth	0 - 2 ft	0 - 1.8 ft	0 - 2.8 ft
					Sample Type	N	N	N
					Matrix	SE	SE	SE
		DMMP SL2021	DMMP BT2021	DMMP ML2021				
Dibenzo(a,h)anthracene	SW8270E	230		1900	402	374 J	414	
Dibenzofuran	SW8270E	540		1700	61.5 J	54.3 J	126	
Fluoranthene	SW8270E	1700	4600	30000	5780	5800 J	10200	
Fluorene	SW8270E	540		3600	67.1 J	103	209	
Indeno(1,2,3-c,d)pyrene	SW8270E	600		4400	1150	1070	1390	
Naphthalene	SW8270E	2100		2400	66.3 J	51.7 J	113	
Phenanthrene	SW8270E	1500		21000	2910	3060 J	5270	
Pyrene	SW8270E	2600	11980	16000	5000	4720 J	8870	
Total Benzo(a,h)anthracenes (b,j,k) (U = 0)		3200		9900	5340	4110	6580	
Total HPAH (DMMP) (U = 0)		12000		69000	28000	24000 J	41200	
Total LPAH (DMMP) (U = 0)		5200		29000	3860 J	3880 J	7880 J	
Pesticides (µg/kg)								
2,4'-DDD (o,p'-DDD)	SW8081B				208 U	136 U	181 U	
2,4'-DDE (o,p'-DDE)	SW8081B				5.21 U	3.88 U	3.62 U	
2,4'-DDT (o,p'-DDT)	SW8081B				5.21 U	3.88 U	3.62 U	
4,4'-DDD (p,p'-DDD)	SW8081B	16			224 U	97.1 UJ	217 U	
4,4'-DDE (p,p'-DDE)	SW8081B	9			26.2	10.8	25.6	
4,4'-DDT (p,p'-DDT)	SW8081B	12			5.21 U	3.88 U	181 U	
Aldrin	SW8081B	9.5			2.6 U	1.94 U	1.81 U	
Chlordane, alpha- (Chlordane, cis-)	SW8081B				2.6 U	1.94 U	1.81 U	
Chlordane, beta- (Chlordane, trans-)	SW8081B				24.5	13.2 J	32.2	
Dieldrin	SW8081B	1.9		1700	5.21 U	3.88 U	3.62 U	
Endrin ketone	SW8081B				5.21 U	3.88 U	3.62 U	
Heptachlor	SW8081B	1.5		270	2.6 U	1.94 U	1.81 U	
Hexachlorocyclohexane (BHC), beta-	SW8081B				2.6 U	1.94 UJ	1.81 U	
Nonachlor, cis-	SW8081B				208 U	69.9 U	149 U	
Nonachlor, trans-	SW8081B				27.7	12.9	34.5	
Oxychlordane	SW8081B				5.21 U	3.88 U	3.62 U	
Sum 4,4 DDT, DDE, DDD (U = 0)			50	69	26.2	10.8 J	25.6	
Total Chlordane (DMMP) (U = 0)		2.8	37		52.2	26.1 J	66.7	
Dioxin Furans (ng/kg)								
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B				2.05	0.339 U	0.625 U	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B				11.9	6.17	10.2	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				14.4	7.49	12.4	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				55.9	27.2	53	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B				32.3	16.7	28.2	

Table 2
Composite Sediment Core Sample Analytical Results Compared to DMMP Criteria

					Task DMMU	MBYC_2023 DMMU-1	MBYC_2023 DMMU-2	MBYC_2023 DMMU-3
					Sample ID	DU-1A-20230919	DU-2A-20230919	DU-3A-20230918
					Sample Date	9/19/2023	9/19/2023	9/18/2023
					Depth	0 - 2 ft	0 - 1.8 ft	0 - 2.8 ft
					Sample Type	N	N	N
					Matrix	SE	SE	SE
		DMMP _{SL} 2021	DMMP _{BT} 2021	DMMP _{ML} 2021				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B					1090	628	1150
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	E1613B					7540 J	4770 J	8920 J
Total Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B					28.6	4.69 J	17.5
Total Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B					58.2	27.3 J	47.6
Total Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B					422	245	406
Total Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B					2460	1510	2660
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	E1613B					11.5 J	6.01 J	8.13 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B					8.54	3.52	8.12
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B					9.33	4.12 J	9.03 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B					23.7	10.1	24.7
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B					21.2	10	22
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	E1613B					7.73	4.03	8.66
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B					19 J	6.82	12.9
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	E1613B					277	157	351
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	E1613B					17.6	11.7	22.4
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	E1613B					412	270	318
Total Tetrachlorodibenzofuran (TCDF)	E1613B					159	52.5	86.4
Total Pentachlorodibenzofuran (PeCDF)	E1613B					266	110 J	138
Total Hexachlorodibenzofuran (HxCDF)	E1613B					536	289	596
Total Heptachlorodibenzofuran (HpCDF)	E1613B					737	408	903
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)		4	10			51.8 J	26 J	48.5 J
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)		4	10			51.8 J	26 J	48.2 J
PCB Aroclors (µg/kg)								
Aroclor 1016	SW8082A					20.9 U	15.5 U	14.5 U
Aroclor 1221	SW8082A					20.9 U	15.5 U	14.5 U
Aroclor 1232	SW8082A					20.9 U	15.5 U	14.5 U
Aroclor 1242	SW8082A					20.9 U	15.5 U	14.5 U
Aroclor 1248	SW8082A					212	78.5 J	127 J
Aroclor 1254	SW8082A					305 J	159	133
Aroclor 1260	SW8082A					130	86.5	95
Total DMMP PCB Aroclors (U = 0)		130		3100		650 J	324 J	355 J
PCB Aroclors (mg/kg-OC)								
Total DMMP PCB Aroclors (U = 0)			38			3.7 J	2.49 J	2.16 J

Notes:

Detected concentration is greater than DMMP_{SL}2021 screening level

Detected concentration is greater than DMMP_{BT}2021 screening level

Table 2
Composite Sediment Core Sample Analytical Results Compared to DMMP Criteria

				Task	MBYC_2023	MBYC_2023	MBYC_2023
				DMMU	DMMU-1	DMMU-2	DMMU-3
				Sample ID	DU-1A-20230919	DU-2A-20230919	DU-3A-20230918
				Sample Date	9/19/2023	9/19/2023	9/18/2023
				Depth	0 - 2 ft	0 - 1.8 ft	0 - 2.8 ft
				Sample Type	N	N	N
				Matrix	SE	SE	SE
DMMP	SL2021	PBT2021	PML2021				

Detected concentration is greater than DMMPML2021 screening level

Bold: Detected result

Calculated values have been rounded to laboratory-reported significant digits.

J: Estimated value

U: Compound analyzed for, but not detected above detection limit

UJ: Compound analyzed for, but not detected above estimated detection limit

Table 3
Discrete Sediment Core Sample Analytical Results Compared to DMMP Criteria

					Task DMMU	MBYC_2023 DMMU-1	MBYC_2023 DMMU-1	MBYC_2023 DMMU-1	MBYC_2023 DMMU-2	MBYC_2023 DMMU-2	MBYC_2023 DMMU-2
					Sample ID	C-1-A-20230919	C-2-A-20230919	C-3-A-20230919	C-4-A-20230919	C-5-A-20230919	C-6-A-20230919
					Sample Date	9/19/2023	9/19/2023	9/19/2023	9/19/2023	9/19/2023	9/19/2023
					Depth	0 - 1.6 ft	0 - 1.4 ft	0 - 3 ft	0 - 2.8 ft	0 - 1.5 ft	0 - 1.1 ft
					Sample Type	N	N	N	N	N	N
					Matrix	SE	SE	SE	SE	SE	SE
					X	122.2091369	122.2087499	122.2079577	122.2085854	122.2079996	122.2076603
					Y	47.60853875	47.60812778	47.6078145	47.60904344	47.60880553	47.60840789
DMMPSL2021					DMMPB2021	DMMPSL2021	DMMPB2021	DMMPSL2021	DMMPB2021	DMMPSL2021	DMMPB2021
Conventional Parameters (pct)											
Total solids	D2216					15.21	15.84	25.97	31.62	26.77	20.67
Dioxin Furans (ng/kg)											
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDC	E1613B					2.27	1.55 EMPC	1.05 U	0.95 J	0.704 U	0.957 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeC	E1613B					5.81 EMPC	10	12.6 EMPC	8.08	2.05 EMPC	7.17
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (H	E1613B					8.8	15.1	17.4	11.8	2.56	11.3
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (H	E1613B					34.5	50.4	59.6	36	28.5	35.7
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (H	E1613B					15.9	32.4	39.6	22.4	7.66	23.8
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	E1613B					968	1080	973	731	909	950
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	E1613B					8100	8650	6860	5860	7530	7080
Total Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B					12	23.5	14.2	3.59	6.7	0 U
Total Pentachlorodibenzo-p-dioxin (PeCDE	E1613B					8.5	46.3	25.5	30.6	6.81	9.63
Total Hexachlorodibenzo-p-dioxin (HxCDD	E1613B					524	505	444	385	203	529
Total Heptachlorodibenzo-p-dioxin (HpCD	E1613B					4720	3120	1930	1810	1910	3140
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	E1613B					10.3	9.11	10.1	5.32 EMPC	1.81 EMPC	4.1 EMPC
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B					5.03	5.6	6.17	4.42	1.35	3.53
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B					7.76	5.95	7.51	3.99	1.99 EMPC	4.17 EMPC
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF	E1613B					21.7	16.7	19.1	11	10	10.6
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF	E1613B					11.3	14.2	16.9	10.7	11.5	9.6
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF	E1613B					5.16 EMPC	4.78	4.63	2.65	2.01	2.72 EMPC
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF	E1613B					8.5 EMPC	8.38	12.1	7.05	10.1	5.27
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpC	E1613B					177	201	232	164	317	149
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpC	E1613B					11.4	13.2	15	11.6	11.6	10.7 EMPC
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OC	E1613B					201	336	344	269	434	251
Total Tetrachlorodibenzofuran (TCDF)	E1613B					97.2	114	135	53.2	33.7	45.4
Total Pentachlorodibenzofuran (PeCDF)	E1613B					192	186	186	95.9	74.7	65.6
Total Hexachlorodibenzofuran (HxCDF)	E1613B					312	409	455	364	353	281
Total Heptachlorodibenzofuran (HpCDF)	E1613B					442	533	573	432	715	378
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)		4	10			36.2292	44.2478	47.8673	31.9563 J	25.2187	32.6107
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)		4	10			36.2292	44.2478	47.3423	31.9563 J	24.8667	32.1322

Notes:

Detected concentration is greater than DMMPSL2021 screening level

Detected concentration is greater than DMMPB2021 screening level

Table 3
Discrete Sediment Core Sample Analytical Results Compared to DMMP Criteria

 Detected concentration is greater than DMMPML2021 screening level

Bold: Detected result

Calculated values have been rounded to laboratory-reported significant digits.

J: Estimated value

U: Compound analyzed for, but not detected above detection limit

Table 4
Sediment Core Z-Sample Analytical Results Compared to SMS Criteria

			Task	MBYC_2023	MBYC_2024	MBYC_2024	MBYC_2024	MBYC_2024
			DMMU	DMMU-1	DMMU-1	DMMU-2	DMMU-2	DMMU-3
			Sample ID	C-3-Z-20230919	DU-1Z-20230919	DU-2Z-20230919	DU-2Z-20230919-RE	DU-3Z-20230918
			Sample Date ¹	9/19/2023	8/16/2024	8/16/2024	8/16/2024	8/16/2024
			Depth	3 - 5 ft	2 - 4 ft	1.8 - 3.8 ft	1.8 - 3.8 ft	2.8 - 4.8 ft
			Sample Type	N	N	N	N	N
			Matrix	SE	SE	SE	SE	SE
			X	122.2079577				
			Y	47.6078145				
			SMS_Fresh_SCO_SCU MII_2019					
Conventional Parameters (pct)								
Total organic carbon	SW9060AM			10.6	22.4	19.1	--	35.3
Total solids	D2216			18.97	14.33	20.65	--	10.55
Total solids	SM2540G			19.89	13.72	20.86	--	10.52
Metals (mg/kg)								
Mercury	SW7471B	0.66	0.8	0.298	0.32	0.212	--	0.181 J
Zinc	SW6020	3200	4200	268	262	51	--	56.2 U
Semivolatile Organics (µg/kg)								
Bis(2-ethylhexyl)phthalate	SW8270E	500	22000	--	6840	373	--	49.9 U
Butylbenzyl phthalate	SW8270E			--	349	132 U	--	20.0 U
Polycyclic Aromatic Hydrocarbons (µg/kg)								
1-Methylnaphthalene	SW8270E			50.3 U	99.6 U	132 U	--	20.0 U
2-Methylnaphthalene	SW8270E			120	63.6 J	132 U	--	20.0 U
Acenaphthene	SW8270E			442	177	132 U	--	20.0 U
Acenaphthylene	SW8270E			50.3 U	99.6 U	132 U	--	20.0 U
Anthracene	SW8270E			1930	843	132 U	--	20.0 U
Benzo(a)anthracene	SW8270E			--	1120	132 U	--	20.0 U
Benzo(a)pyrene	SW8270E			--	665	132 U	--	20.0 U
Benzo(b,j,k)fluoranthenes	SW8270E			--	1570	263 U	--	39.9 U
Benzo(g,h,i)perylene	SW8270E			--	633	132 U	--	20.0 U
Chrysene	SW8270E			--	1570	95.3 J	--	20.0 U
Dibenzo(a,h)anthracene	SW8270E			--	99.6 U	132 U	--	20.0 U
Fluoranthene	SW8270E			--	9020	174	--	16.3 J
Fluorene	SW8270E			176	99.6 U	132 U	--	20.0 U
Indeno(1,2,3-c,d)pyrene	SW8270E			--	524	132 U	--	20.0 U
Naphthalene	SW8270E			90.4	99.6 U	132 U	--	20.0 U
Phenanthrene	SW8270E			7610	4030	132 U	--	20.0 U
Pyrene	SW8270E			--	6560	176	--	16.9 J
Total PAH (SMS Freshwater 2019) (U = 0 max limit)		17000	30000	10000	26800 J	445 J	--	33.2 J
Pesticides (µg/kg)								
2,4'-DDD (o,p'-DDD)	SW8081B			10.0 U	27.4 J	61.9 U	--	9.99 U
2,4'-DDE (o,p'-DDE)	SW8081B			10.0 U	46.8 U	61.9 U	--	9.99 U
2,4'-DDT (o,p'-DDT)	SW8081B			10.0 U	46.8 U	61.9 U	--	9.99 U
4,4'-DDD (p,p'-DDD)	SW8081B			276	--	--	--	--
4,4'-DDE (p,p'-DDE)	SW8081B			84.5 J	42.3 J	61.9 U	--	9.99 U

Table 4
Sediment Core Z-Sample Analytical Results Compared to SMS Criteria

			Task	MBYC_2023	MBYC_2024	MBYC_2024	MBYC_2024	MBYC_2024
			DMMU	DMMU-1	DMMU-1	DMMU-2	DMMU-2	DMMU-3
			Sample ID	C-3-Z-20230919	DU-1Z-20230919	DU-2Z-20230919	DU-2Z-20230919-RE	DU-3Z-20230918
			Sample Date ¹	9/19/2023	8/16/2024	8/16/2024	8/16/2024	8/16/2024
			Depth	3 - 5 ft	2 - 4 ft	1.8 - 3.8 ft	1.8 - 3.8 ft	2.8 - 4.8 ft
			Sample Type	N	N	N	N	N
			Matrix	SE	SE	SE	SE	SE
			X	122.2079577				
			Y	47.6078145				
			SMS_Fresh_SCO_SCU MII_2019	SMS_Fresh_CSL_SCU MII_2019				
4,4'-DDT (p,p'-DDT)	SW8081B			10.0 U	--	--	--	--
Chlordane, alpha- (Chlordane, cis-)	SW8081B			77.7	24.3	15.7 J	--	4.99 U
Chlordane, beta- (Chlordane, trans-)	SW8081B			92.9 J	34.2	30.9 U	--	4.99 U
Nonachlor, cis-	SW8081B			10.0 U	46.8 U	61.9 U	--	9.99 U
Nonachlor, trans-	SW8081B			10.0 U	46.8 U	61.9 U	--	9.99 U
Oxychlordane	SW8081B			10.0 U	46.8 U	61.9 U	--	9.99 U
Sum DDD (U = 0 max limit)		310	860	276	27.4 J	61.9 U	--	9.99 U
Sum DDE (U = 0 max limit)		21	33	84.5 J	42.3 J	61.9 U	--	9.99 U
Sum DDT (U = 0 max limit)		100	8100	10.0 U	46.8 U	61.9 U	--	9.99 U
Dioxin Furans (ng/kg)								
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B			6.05	2.64	1.69 U	--	0.434 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B			18.8	7.94 EMPC	1.64 U	--	0.813 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B			19.2 EMPC	10.7	1.60 U	--	0.953 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B			81.1	38	1.65 U	--	0.839 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B			45.6	23.5 EMPC	1.76 U	--	1.03 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B			1710	774	20.2	--	15.5
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	E1613B			13400	6670	254	--	182
Total Tetrachlorodibenzo-p-dioxin (TCDD)	E1613B			45.5	20.8	0 U	--	1.66 J
Total Pentachlorodibenzo-p-dioxin (PeCDD)	E1613B			84.9	17.7	0 U	--	0 U
Total Hexachlorodibenzo-p-dioxin (HxCDD)	E1613B			609	265	3.8	--	4.02
Total Heptachlorodibenzo-p-dioxin (HpCDD)	E1613B			3790	1870	48.8	--	34.4
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	E1613B			39.1	17.5	2.76 U	--	0.632 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B			14.8	6.23	1.33 U	--	0.621 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	E1613B			22.7	10.5	1.39 U	--	0.744 JEMPC
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B			67.5	27.6	1.03 U	--	0.489 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B			44.7	19.1	1.03 U	--	0.464 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	E1613B			15.1	6.55 EMPC	1.48 U	--	0.680 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	E1613B			46.1	20.1	1.08 U	--	0.482 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	E1613B			568	223	8.50 EMPC	--	6.68
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	E1613B			35.4	13.2	1.82 U	--	1.49 U
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	E1613B			840	309	14.6	--	3.67 J
Total Tetrachlorodibenzofuran (TCDF)	E1613B			511	187	0 U	--	0 U
Total Pentachlorodibenzofuran (PeCDF)	E1613B			864	308	17.4	--	8.43
Total Hexachlorodibenzofuran (HxCDF)	E1613B			1020	421	19	--	10.6
Total Heptachlorodibenzofuran (HpCDF)	E1613B			1350	532	0 U	--	6.68

Table 4
Sediment Core Z-Sample Analytical Results Compared to SMS Criteria

			Task	MBYC_2023	MBYC_2024	MBYC_2024	MBYC_2024	MBYC_2024
			DMMU	DMMU-1	DMMU-1	DMMU-2	DMMU-2	DMMU-3
			Sample ID	C-3-Z-20230919	DU-1Z-20230919	DU-2Z-20230919	DU-2Z-20230919-RE	DU-3Z-20230918
			Sample Date ¹	9/19/2023	8/16/2024	8/16/2024	8/16/2024	8/16/2024
			Depth	3 - 5 ft	2 - 4 ft	1.8 - 3.8 ft	1.8 - 3.8 ft	2.8 - 4.8 ft
			Sample Type	N	N	N	N	N
			Matrix	SE	SE	SE	SE	SE
			X	122.2079577				
			Y	47.6078145				
SMS_Fresh_SCO_SCU MII_2019			SMS_Fresh_CSL_SCU MII_2019					
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0 max limit)				95	42.4	0.368	--	0.585 J
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2 max limit)				95	42.4	2.89	--	1.46 J
PCB Aroclors (µg/kg)								
Aroclor 1016	SW8082A			12.5 U	18.7 U	24.7 U	8.5 U	4.0 U
Aroclor 1221	SW8082A			12.5 U	18.7 U	24.7 U	8.5 U	4.0 U
Aroclor 1232	SW8082A			12.5 U	18.7 U	24.7 U	8.5 U	4.0 U
Aroclor 1242	SW8082A			12.5 U	18.7 U	24.7 U	8.5 U	4.0 U
Aroclor 1248	SW8082A			517 J	273 J	30.9	16.8	4.0 U
Aroclor 1254	SW8082A			525 J	278	80.7 J	8.5 U	4.6
Aroclor 1260	SW8082A			284	121	24.7 U	8.5 U	4.0 U
Total PCB Aroclors (SMS Freshwater 2019) (U = 0 max limit)		110	2500	1330 J	672 J	112 J	16.8	4.6

Notes: present both

1. All sediment sample collection occurred in September 2023. Z-layer sample compositing occurred in August 2024.

Detected concentration is greater than SMS_Fresh_SCO_SCUMII_2019 screening level

Detected concentration is greater than SMS_Fresh_CSL_SCUMII_2019 screening level

Bold: Detected result

Calculated values have been rounded to laboratory-reported significant digits

J: Estimated value

U: Compound analyzed for, but not detected above detection limit