Prepared by:
Dredged Material Management Office
Seattle District, U.S. Army Corps of Engineers

MEMORANDUM FOR RECORD **February 10, 2020**

SUBJECT: DETERMINATION REGARDING THE SUITABILITY OF PROPOSED DREDGED MATERIAL FROM THE ICE HARBOR DAM UPSTREAM NAVIGATION FLOATING GUIDEWALL CABLE REPLACEMENT PROJECT (CENWW-PPL-C 2019-0104), EVALUATED UNDER SECTION 404 OF THE CLEAN WATER ACT FOR UNCONFINED OPEN-WATER DISPOSAL IN THE SNAKE RIVER.

1. **Introduction**. This memorandum reflects the consensus determination of the Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Washington State Department of Ecology, Washington State Department of Natural Resources, and the Environmental Protection Agency) regarding the suitability of up to 2,000 cubic yards (cy) of proposed dredged material from the upstream navigation floating guide wall cable anchor at the Ice Harbor Dam on the Snake River in eastern Washington (Figure 1). This determination assesses sediment suitability for open-water disposal on the Snake River and compliance of the sediment surface to be exposed by this dredging with the State of Washington's anti-degradation standard.

2. **Background.** The Ice Harbor Dam is a U.S. Army Corps of Engineers (USACE) facility located on the lower Snake River approximately 9.7 miles upstream from the confluence with the Columbia River (Figure 1). Upstream of the dam, a navigation floating guide wall is secured via two sets of cables that attach to an anchor and deadman (Figure 2). The cables were last replaced in 1985 and currently have 20 percent of life remaining. The anchor block to which one set of cables is attached is located in approximately 100 feet of water. Up to 2,000 cubic yards (cy) of sediment has accumulated on top of the anchor and must be removed to access the anchor connection for cable replacement.

   The USACE Walla Walla District proposes to remove the sediment and expose the anchor point through a combination of a remote-controlled hydraulic pump and diver-assisted hand-held suction dredge. The proposed disposal area is a shallow, underwater bench adjacent to the upstream dam face (Figure 3).

3. **Project Summary**. Table 1 provides project summary and tracking information.

Table 1. Project Summary

Project ranking	Moderate
Conceptual design target depth	Exposure of concrete anchor block (~100 ft below water surface)
Volume proposed for dredging	2000 cy
SAP approved	NA. Sampling occurred before DMMP review and approval of SAP.

Sampling date	November 25, 2019
1st Draft Sediment Characterization Report (SCR) received	January 10, 2020
DMMP comments provided on 1st draft SCR	January 16, 2020
Final SCR received	January 20, 2020
DMMO tracking number	ICEHB-1-A-F-411
EIM Study ID	ICEHB19
USACE Project Tracking Number	CENWW-PPL-C 2019-0104
Recency Expiration Date (moderate rank = 5 years)	November 2024

4. **Project Ranking and Sampling Requirements**. This project has been ranked "moderate" by the DMMP agencies for concern for potential contamination. For a moderate-ranked project, the requirements for the number of field samples and dredged material management units (DMMUs) are as follows (DMMP, 2018):
   - Maximum volume of sediment represented by each field sample = 4,000 cubic yards
   - Maximum volume of sediment represented by each DMMU in homogeneous sediment = 20,000 cubic yards

   Since the material has accumulated since the last anchor replacement occurred in 1985, the material is assumed to be well-mixed, homogenous sediment. No subsurface DMMUs are required. For a volume of up to 2,000 cy, one grab sample station would be sufficient.

   The project proponent did not provide the Sampling and Analysis Plan (SAP) to the DMMP agencies for review prior to sampling. Conducting sampling and analysis without submitting a SAP to the DMMP agencies for review and approval is inconsistent with the program process and strongly discouraged. Chemical data generated by a project without an approved SAP may be insufficient for the DMMP agencies to provide a suitability determination. Overall project costs may be increased by the need for additional sampling and analysis to fulfill DMMP requirements.

5. **Sampling and Analysis**. On November 25, 2019, two sediment grabs were collected by USACE personnel utilizing a work skiff and a Ponar sampler. Figure 2 shows the locations of the two grab samples, and Table 2 lists the location details. Sample processing and delivery to the laboratory occurred on the same day as collection. Two homogenized samples (one from each grab sample station) were delivered to Anatek Labs Inc. in Moscow, Idaho for analysis.

6. **Analytical Results**. The conventional and chemistry results for the two samples (IHR 9.8.2B and IHR 9.8.2C) are presented alongside the DMMP freshwater guidelines in Table 3.

   Grain Size and Sediment Conventionals. Both samples were analyzed for all conventional sediment parameters except total volatile solids. TOC was moderate (1.87% and 1.90% respectively), and grain size analysis indicated that the material had significant fines content (33.4% and 41.1% respectively). Total solids (35.3% and 32.7% respectively) were also fairly low.

Standard DMMP Chemicals of Concern. No detected chemistry results exceeded the DMMP Screening Level (SL) or Bioaccumulation Trigger (BT) for the freshwater chemicals of concern (COCs). Initial non-detect exceedances for silver, di-n-octyl phthalate, and Aroclor 1221 were subsequently resolved by the laboratory after re-evaluating the data and calibration curves. For silver, the lab was able to re-examine the output data and provide J-flagged quantitative results that were below the DMMP SL1. For di-n-octyl phthalate and Aroclor, the laboratory re-evaluated the output data and calibration curves and was able to provide a Method Detection Limit (MDL) below the DMMP SL. The DMMP accepted the use of the MDL to determine that di-n-octyl phthalate and Aroclor 1221 were not detected above the DMMP SL1. In summary, no detects or non-detects exceeded the DMMP SLs or BTs for the standard freshwater COCs (with the exception of tributyltin, see discussion below).

Dioxins/furans. Dioxin/furan analysis was not required for this project due to a lack of historical or current source of dioxins/furans in the vicinity of the site.

TBT. Tributyltin (TBT) analyses were not conducted for this project although TBT analyses are required for DMMP freshwater projects. The DMMP agencies recognize the lack of a nearby source activity for TBT and concur that the likelihood of TBT contamination is low for this specific project. This decision does not preclude the requirement for inclusion of TBT in future DMMP sediment characterizations for projects on the Snake River.

7. **Biological Testing**. Biological testing was not required; concentrations of all detected and non-detected chemicals of concern were below DMMP screening levels.

8. **Sediment Exposed by Dredging**. The surface to be exposed by dredging is the anchor structure. No new sediment surface will be exposed. In addition, the concentrations of all DMMP COCs in the dredge prism were below the DMMP SL1 criteria; therefore any exposed sediment will be in compliance with the State of Washington anti-degradation standard.

9. **Debris Management**. Best management practices (BMPs) are recommended to remove any anthropogenic debris (e.g. lost equipment or debris encountered during hydraulic dredging) and to dispose of this debris appropriately.

10. **Suitability and Antidegradation Determination**. This memorandum documents the evaluation of the suitability of sediment proposed for dredging from the Ice Harbor Dam upstream navigation guide wall anchor structure for open-water disposal in the Snake River.

    The DMMP agencies have concluded that **up to 2,000 cy of material from the Ice Harbor Dam upstream navigation guide wall anchor are suitable** for open-water disposal in the lower Snake River.

    The DMMP agencies do not manage any specific open-water disposal sites in the Snake River. The project proponent must coordinate with appropriate resources agencies, as necessary, regarding the acceptability of the final selected placement method and location for the dredged material.

11. **References**.

DMMP, 2018. *Dredged Material Evaluation and Disposal Procedures (User Manual)*. Prepared by the Seattle District Dredged Material Management Office for the Dredged Material Management Program, December 2018.

USACE, 2019. *Sampling and Analysis Plan for Sediment Removal at the Ice Harbor Upstream Navigation Floating Guidewall Anchor*. Prepared by USACE Walla Walla District, December 2019.

USACE, 2020. *Sampling and Analysis Results: Ice Harbor Upstream Navigation Floating Guidewall Cable Replacement*. Prepared by USACE Walla Walla District, January 2020.

12. Agency Signatures.

signed copy on file in DMMO - Seattle District office

Concur:

_____ _____
Date Heather Whitney Fourie – U.S. Army Corps of Engineers, Seattle District

_____ _____
Date Justine Barton - Environmental Protection Agency, Region X

_____ _____
Date Laura Inouye, Ph.D. - Washington Department of Ecology

_____ _____
Date Shannon Soto - Washington Department of Natural Resources

Copies furnished:
DMMP signatories
Steve Juul, USACE Walla Walla District
Knud Martin, USACE Walla Walla District

Table 2. Grab Sample Collection Data

Sample ID	Sample Date	Sample Time	Decimal Degree (NAD83)		Depth to Mudline (ft)
			Latitude	Longitude	
IHR 9.8.2B	11/25/19	0930	46.250993000	-118.87734399	90.5
IHR 9.8.2C	11/25/19	1045	46.250993000	-118.87729000	86.0

Table 3. Analytical Results

Parameter	Method	DMMP SL1	IHR 9.8.2B						IHR 9.8.2C					
			Sample Number	MDL	MRL	PQL	Result	Q	Sample Number	MDL	MRL	PQL	Result	Q
CONVENTIONALS														
Total solids (%)	EPA 160.3	---	19007				35.2		19015				32.7	
Total Sulfides (mg/kg)	SM 4500S2F	39	19005			57.9	46.3	J	19013			55.4	44.4	J
Ammonia (mg/kg)	SM 4500NH3G	230	19004			8.55	28.7		19012			7.5	26.9	
Total organic carbon (%)	EPA 9060A	---	19003			0.02	1.87		19011			0.02	1.90	
Pebbles, very fine to coarse (%)	ASTM D422 mod	---	19002				24.5		19010				7.2	
Sand, coarse to very fine (%)	ASTM D422 mod	---					41.8						51.7	
Silt and Clay (%)	ASTM D422 mod	---					33.7						41.1	
METALS (mg/kg dry weight)														
Arsenic	EPA 6020A	14	19006			0.67	9.29		19014			0.69	9.68	
Cadmium	EPA 6020A	2.1	“			0.67	ND	U	“			0.69	ND	U
Chromium	EPA 6020A	72	“			0.67	32.5		“			0.69	33.9	
Copper	EPA 6020A	400	“			0.67	31.8		“			0.69	33.0	
Lead	EPA 6020A	360	“			0.67	9.89		“			0.69	16.4	
Mercury	EPA 7471A	0.66	“			0.01	0.09		“			0.01	0.08	
Nickel	EPA 6020A	38	“			0.67	15.7		“			0.69	26.9	
Selenium	EPA 6020A	11	“			0.67	2.57		“			0.69	4.38	
Silver	EPA 6020A	0.57	“			0.67	0.202	J	“			0.69	0.193	J
Zinc	EPA 6020A	3,200	“			0.67	73.7		“			0.69	111	
POLYNUCLEAR AROMATIC HYDROCARBONS (µg/kg)														
Low molecular weight PAHs		---												
1-Methylnaphthalene	EPA 8270D	---	19007	5		10	ND	U	19015	5		10	ND	U
2-Methylnaphthalene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Acenaphthene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Acenaphthylene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Anthracene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Fluorene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Naphthalene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Phenanthrene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
High molecular weight PAHs														

Parameter	Method	DMMP SL1	IHR 9.8.2B						IHR 9.8.2C					
			Sample Number	MDL	MRL	PQL	Result	Q	Sample Number	MDL	MRL	PQL	Result	Q
Benzo(a)anthracene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Benzo(b)fluoranthene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Benzo(k)fluoranthene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Benzo(g,h,i)perylene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Benzo(a)pyrene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Chrysene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Dibenz(a,h)anthracene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Floranthene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Indeno(1,2,3-c,d)pyrene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Pyrene	EPA 8270D	---	“	5		10	ND	U	“	5		10	ND	U
Total PAHs		17,000					10	U					10	U
PHENOLS (µg/kg)														
4-Methylphenol	EPA 8270D	260	19007	40		100	ND	U	19015	40		100	ND	U
Pentachlorophenol	EPA 8270D	1,200	“	40		100	ND	U	“	40		100	ND	U
Phenol	EPA 8270D	120	“	40		100	ND	U	“	40		100	ND	U
MISCELLANEOUS EXTRACTABLES (µg/kg)														
Benzoic acid	EPA 8270D	2,900	19007	100		100	ND	U	19015	100		100	ND	U
Carbazole	EPA 8270D	900	“	40		100	ND	U	“	40		100	ND	U
Dibenzofuran	EPA 8270D	200	“	40		100	ND	U	“	40		100	ND	U
PHTHALATES (µg/kg)														
bis(2-ethylhexyl)phthalate	EPA 8270D	500	19007	40		100	ND	U	19015	40		100	ND	U
Di-n-butyl-phthalate	EPA 8270D	380	“	40		100	ND	U	“	40		100	ND	U
Di-n-octyl-phthalate	EPA 8270D	39	“	20		50	ND	U	“	20		50	ND	U
PESTICIDES (µg/kg)														
2,4’-DDD	EPA 8081B	310	19007		2.7		ND	U	19015		2.2		ND	U
4,4’-DDD	EPA 8081B		“		5.4		ND	U	“		4.4		ND	U
2,4’-DDE	EPA 8081B	21	“		2.7		ND	U	“		2.2		ND	U
4,4’-DDE	EPA 8081B		“		2.7		3.8		“		2.2		5.4	
2,4,’-DDT	EPA 8081B	100	“		2.7		ND	U	“		2.2		ND	U
4,4’-DDT	EPA 8081B		“		5.4		ND	U	“		4.4		ND	U
Dieldrin	EPA 8081B	4.9	“		2.7		ND	U	“		2.2		ND	U
Endrin ketone	EPA 8081B	8.5	“		2.7		ND	U	“		2.2		ND	U

Parameter	Method	DMMP SL1	IHR 9.8.2B						IHR 9.8.2C					
			Sample Number	MDL	MRL	PQL	Result	Q	Sample Number	MDL	MRL	PQL	Result	Q
beta-Hexachlorocyclohexane	EPA 8081B	7.2	"		2.7		ND	U	"		3.1		ND	U
POLYCHLORINATED BIPHENYLS (µg/kg)														
Aroclor 1016	EPA 8082	---	19008	17	56		ND	U	19016	17	57		ND	U
Aroclor 1221	EPA 8083	---	"	17	120		ND	U	"	17	120		ND	U
Aroclor 1232	EPA 8084	---	"	17	56		ND	U	"	17	57		ND	U
Aroclor 1242	EPA 8085	---	"	17	56		ND	U	"	17	57		ND	U
Aroclor 1248	EPA 8086	---	"	17	56		ND	U	"	17	57		ND	U
Aroclor 1254	EPA 8087	---	"	17	56		ND	U	"	17	57		ND	U
Aroclor 1260	EPA 8088	---	"	17	56		ND	U	"	17	57		ND	U
Total Aroclors		110												
TOTAL PETROLEUM (mg/kg)														
Diesel	NWTPHDX	340	19008			25	ND	U	19016			25	ND	U
Lube Oil	NWTPHDX	3,600	"			100	ND	U	"			100	ND	U

Notes:

MDL = Method Detection Limit

MRL = Method Reporting Limit

PQL = Practical Quantitation Limit

SL1 = Screening Level 1

ND = Not Detected

U = Not Detected

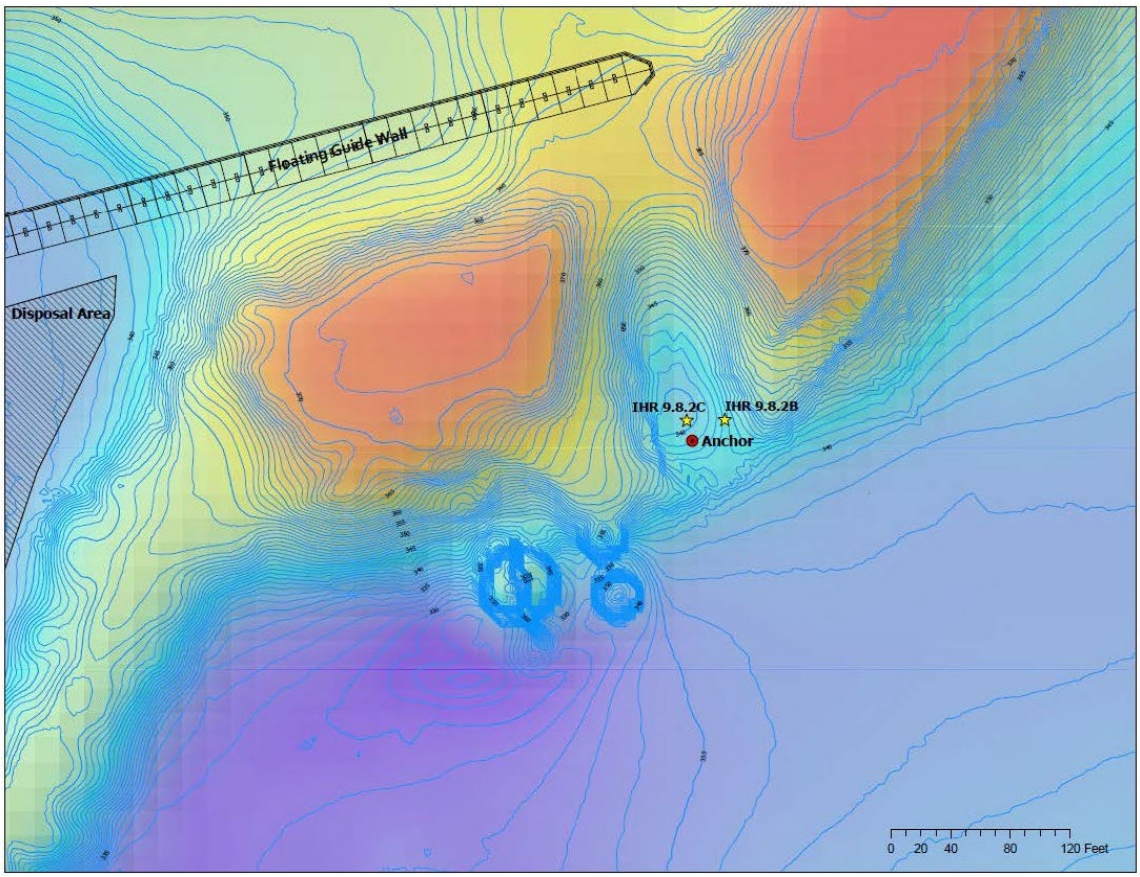
J = estimated

Source: Adapted from Table 4-1 of *Sampling and Analysis Results: Ice Harbor Upstream Navigation Floating Guidewall Cable Replacement* (USACE, 2020)

Figure 1. Project Location Map

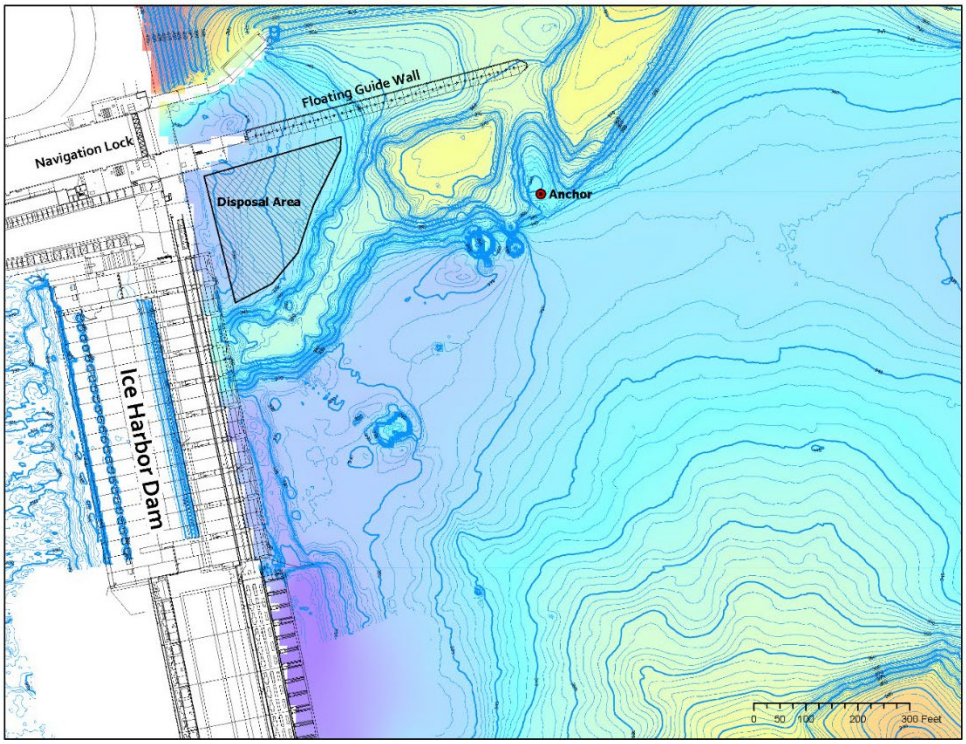
Source: Figure 1-1 of *Sampling and Analysis Plan for Sediment Removal at the Ice Harbor Upstream Navigation Floating Guidewall Anchor* (USACE, 2019)

Figure 2. Grab Sample Locations



Source: Figure 3-1 of *Sampling and Analysis Results: Ice Harbor Upstream Navigation Floating Guidewall Cable Replacement* (USACE, 2020)

Figure 3. Proposed Placement Location



Source: Figure 1-3 of *Sampling and Analysis Results: Ice Harbor Upstream Navigation Floating Guidewall Cable Replacement* (USACE, 2020)