

## MEMORANDUM FOR RECORD

**SUBJECT: DETERMINATION ON THE SUITABILITY OF PROPOSED DREDGED MATERIAL TESTED FOR THE PRIEST RAPIDS RECREATIONAL IMPROVEMENT PROJECT BOAT BASIN AND ACCESS CHANNEL (NWS-2010-1375) EVALUATED UNDER SECTION 404 OF THE CLEAN WATER ACT FOR EITHER IN-WATER OR UPLAND BENEFICIAL USE SITES.**

1. The following summary reflects the consensus suitability determination of the Agencies that comprise the regional Dredged Material Management Program (DMMP) for the State of Washington on testing conducted for the Priest Rapids Recreational Improvement Project. This project is located approximately 3 miles north of the Priest Rapids Dam, and lies within the reservoir created by the Priest Rapids Dam, which is operated by the Grant County PUD in Desert Aire, Washington (**Figure 1:** Vicinity Map; **Figure 2:** Site Features; **Figure 3:** Dredged Material Management Unit and sampling locations). The purpose of this characterization effort is to evaluate the sediment quality within the proposed dredging footprint within the boat basin area estimated at 8,000 cy for potential in-water beneficial reuse, or upland beneficial reuse and/or disposal.
2. **Table 1** documents the regulatory tracking information and dates for the DMMP testing.

**Table 1. Regulatory Tracking Information and Dates**

Initial SAP submittal date:	November 18, 2010
SAP approval date:	December 7, 2010
Sampling date:	February 14-15, 2011
Characterization Report submittal:	April 13, 2011
Volume Tested (# DMMUs), Sampling Method:	8,000 cy; (1 DMMU); Sonic Corer ( 3 core locations)
DAIS Tracking Number:	PRRC-1-A-F-305
<b>Recency Determination Date:</b> <b>Low-Moderate = 6-7 years</b>	February 2017-2018 ( <b>Low-Moderate</b> )

### Sampling and Characterization Background:

3. The project was ranked **low-moderate** in the boat basin for this DMMP characterization, after DMMP agencies reviewed a Level-1 Dredged Material Assessment Report. The initial SAP was submitted on November 18, 2010, and approved by the DMMP agencies on December 7, 2010 (See **Table 1**).

## Sampling:

4. The following process for evaluating the 3 samples and compositing was followed, which was pre-approved by the DMMP agencies prior to sampling.
  - The portion of the core collected from the surface of the dredge prism comprised of fine grained material (i.e., silt and sand) at each core location was used to prepare a sample that is representative of surface material within the DMMU for testing.
  - The stratigraphy and grain size of material was documented within the dredge prism underlying the surface, including the amount of fine grained material at each core location to identify whether the underlying material contains a significant (i.e., 6 inches or greater in thickness) layer or layers of fine grained material.
  - If the material underlying the surface-fine grained material is comprised of gravel, no sampling or testing of the underlying material would be required prior to dredging and reuse of the underlying material.
  - The suitability determination is restricted to an evaluation of the surface, fine grained material, and underlying coarse grained (e.g., gravel, cobble) material is considered suitable.
  - Core samples for DMMU-1-1 and DMMU-1-3 within the boat basin had a 1 foot and 3 foot layer of silty-sand, or silty-gravel-sand, respectively. No fine grained material was observed at DMMU-1-2 outside the boat basin, which was comprised of gravel down to 9 feet, so compositing for DMMU-C1 was limited to Stations 1-1 and 1-3 within the boat basin.
  
5. **Figure 1** depicts the site vicinity and **Figures 2-3** depict the locations for the 3 sampling stations occupied for the 2011 characterization effort within the single DMMU. The single DMMU was composited from 2 stations/samples collected with a Sonic corer on February 14-15, 2011 (see **Table 2**).
  
6. The Data Characterization Report was submitted to the DMMP agencies for review on April 13, 2011. The DMMP agencies concluded, after reviewing the data validation report, that the data was acceptable for decision-making using best professional judgment.

**Table 2. Actual Sediment Sampling Locations (Priest Rapids Recreation Area)**

DMMU ID	Core sample ID	Latitude*	Longitude*	Core Target Depth (ft bgs)	Dredge Prism Depth (ft bgs)	Z-Layer Depth Interval (feet bgs)
DMMU-C1 (boat basin)	DMMU-1-1	46.6845341237	-119.932585786	11	0 to 9	9 to 11
	DMMU-1-3	46.6840741234	-119.932085786	11	0 to 9	9 to 11
Channel	DMMU-1-2	46.6841341231	-119.932885787	11	0 to 9	9 to 11

\*NAD83 Coordinates; bgs = below ground surface

## **Chemical Testing Results:**

7. The chemical testing results summary for the Priest Rapids project compared to DMMP freshwater and marine carbon-normalized guidelines is provided in **Table 3**. It demonstrates that for chemicals of concern no detected or undetected chemicals exceeded DMMP freshwater, or dry-weight marine guidelines, or bioaccumulation triggers. Moreover, evaluation of these data relative to SMS guidelines, indicate that there were no detected Sediment Quality Standard (SQS) exceedances within the boat basin DMMU-C1.
8. However, for Dieldrin, the duplicate sample was undetected slightly over the SL1, although the sample result was undetected at the SL1. For this chemical, based on an evaluation of the entire chemical testing results and weight of evidence, including the project area location relative to potential contamination sources, suggests that the undetected duplicate sample SL1 exceedance is not a problem using best-professional-judgment (BPJ).
9. There were two undetected carbon-normalized chemicals that exceeded the marine SL2 guidelines, and these were Hexachlorobenzene and 1,2,4-Trichlorobenzene. Both of these undetected chemicals were below the dry weight SL1/SL2 guidelines, and the carbon-normalized SL2 exceedances were evaluated by DMMP as not being a concern using BPJ.

## **Suitability Determination:**

10. In summary, the results of these analyses (including all DMMP COCs) after comparison to SMS guidelines, indicate that all 8,000 cy of proposed dredged material are suitable for either in-water beneficial reuse on the shoreline east of the boat basin, or as part of Jetty construction, or upland beneficial reuse at approved locations.
  11. This memorandum documents the suitability of material proposed for dredging from the Priest Rapids Recreation Area Improvement Project in Desert Aire, Washington, for disposal at either an appropriate in-water or upland beneficial reuse disposal site. However, this suitability determination does not constitute final agency approval of the project. A dredging plan for this project must be completed as part of the final project approval process. 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.
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Concur:

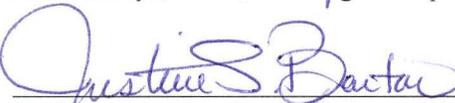
5/4/2011  
Date

  
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David Kendall, Ph.D., Seattle District Corps of Engineers

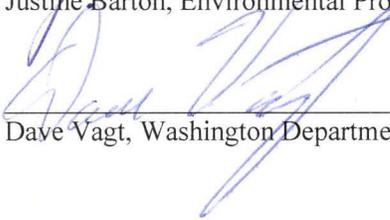
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Laura Inouye, Ph.D., Washington Department of Ecology

5/2/11  
Date

  
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Justine Barton, Environmental Protection Agency, Region 10

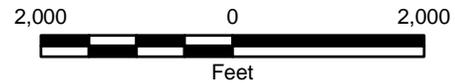
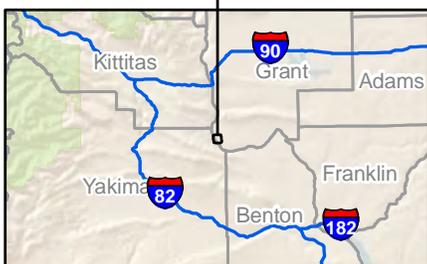
4/25/2011  
Date

  
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Dave Vagt, Washington Department of Natural Resources

**Copies Furnished:**

Regulatory Project Manager  
Laura Inouye, Ph.D., Ecology  
Justine Barton, EPA  
Dave Vagt, DNR  
DMMO File

Map Revised: May 11, 2010 KKS  
 Path: \\TAC\projects\2\164031\GIS\2\16403100\_F1\_VicinityMap.mxd  
 Office: TAC

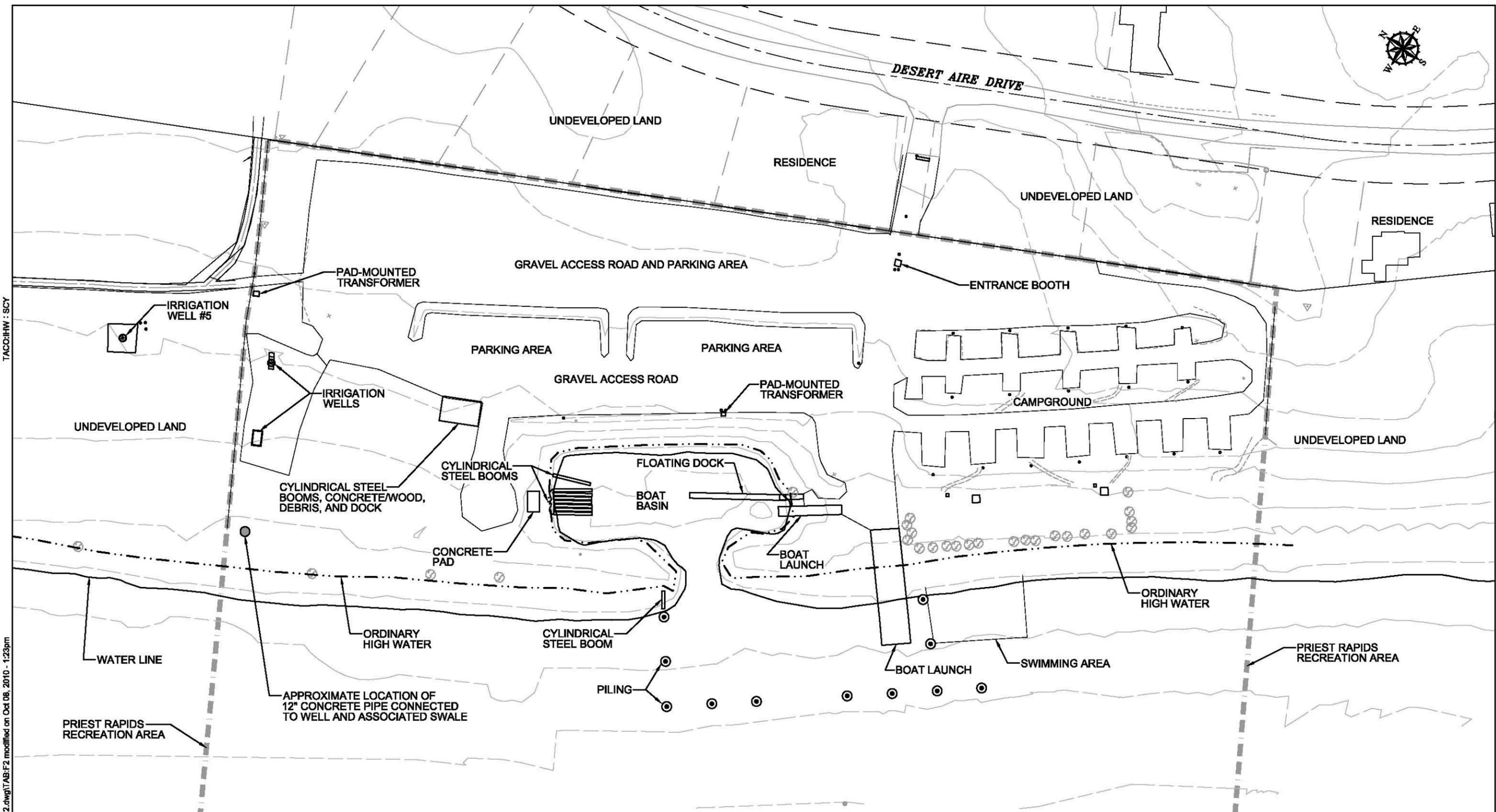


**Notes:**

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
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Data Sources: ESRI Data & Maps, Street Maps 2008  
 Transverse Mercator, Zone 11 N North, North American Datum 1983  
 North arrow oriented to grid north

<b>Vicinity Map</b>	
Desert Aire Recreational Improvement Project Grant County, Washington	
	<b>Figure 1</b>



TACO:HW - SCY

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Notes:  
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 Reference: Drawing provided by MacKay & Sposito, Inc., dated 9/21/10.

Site Features	
Priest Rapids Recreation Area Improvements Project Desert Aire, Washington	
	<b>Figure 2</b>



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Data Sources: 2006 Aerial photograph from ESRI.

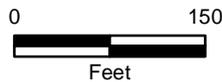
Washington State Plane South, North American Datum 1983  
North arrow oriented to grid north



Actual Sampling Location and ID



Planned Sampling Location and ID



<b>Coring and Sample Locations</b>	
Priest Rapids Recreation Area Improvements Project Desert Aire, Washington	
	<b>Figure 3</b>

**Table 3. Priest Rapids Recreation Area Project: DMMP Characterization Summary**

CHEMICAL NAME		Sediment Quality Guidelines						Sample ID:		DMMU-1			DMMU-1 (duplicate)		
		Interim Freshwater      Marine Guidelines						DMMU ID:		C1			C1 (duplicate)		
								Depth (ft BGS)		1-3 ft			1-3 ft		
		Units	Guidelines (dry wgt)				(mg/kg-oc-normalized)		DMMP	mg/kg-dry wgt	mg/kg-OC	VQ	mg/kg-dry wgt	mg/kg-OC	VQ
	SL1	SL2	SL1 (dw)	SL2 (dw)	SL1 ((oc)	SL2 (oc)	BT (dry wgt)	DMMU	SMS		DMMU	SMS			
Antimony		--	--	150	150				7.0		u	7.0		u	
Arsenic	mg/kg	20	51.0	57	93		507.1		7.0		u	7.0		u	
Cadmium	mg/kg	1.1	1.5	5.1	6.7		11.3		0.9			0.8			
Chromium	mg/kg	95	100	260	270		267		8.2			6.8			
Copper	mg/kg	80	830	390	390		1027		22.9			19.6			
Lead	mg/kg	340	430	450	530		975		8.0			7.0			
Mercury	mg/kg	0.28	0.75	0.0	0.59		1.5		0.03		u	0.04		u	
Nickel	mg/kg	60	70	--	--		370		11.0			10.0			
Selenium	mg/kg	--	--				3		0.80		u	0.7		u	
Silver	mg/kg	2.0	2.5	6.1	6		6.1		0.4		u	0.4		u	
Zinc	mg/kg	130	400	410	960		2783		118.0			105.0			
<b>ORGANIC CHEMICALS</b>															
<b>Total LPAH</b>	ug/kg	6,600	9,200	5,200	5,200	370	780		20.0	1.79	u	20.0	1.7	u	
Naphthalene	ug/kg	500	1,300	2,100	2,100	99	170		20.0	1.79	u	20.0	1.7	u	
Acenaphthylene	ug/kg	470	640	560	1,300	66	66		20.0	1.79	u	20.0	1.7	u	
Acenaphthene	ug/kg	1,100	1,300	500	500	16	57		20.0	1.79	u	20.0	1.7	u	
Fluorene	ug/kg	1,000	3,000	540	540	23	79		20.0	1.79	u	20.0	1.7	u	
Phenanthrene	ug/kg	6,100	7,600	1,500	1,500	100	480		20.0	1.79	u	20.0	1.7	u	
Anthracene	ug/kg	1,200	1,600	960	960.0	220	1200		20.0	1.79	u	20.0	1.7	u	
2-Methylnaphthalene	ug/kg	470	560	670	670	38	64		20.0	1.79	u	20.0	1.7	u	
<b>Total HPAH</b>	ug/kg	31,000	55,000	12,000	17,000	960	5300		13.0	1.16	j	10.0	0.8	j	
Fluoranthene	ug/kg	11,000	15,000	1,700	2,500.0	160	1200	4600	13.0	1.16	j	10.0	0.8	j	
Pyrene	ug/kg	8,800	16,000	2,600	3,300	1000	1400	11980	20.0	1.79	u	20.0	1.7	u	
Benzo(a)anthracene	ug/kg	4,300	5,800	1,300	1,600	110	270		20.0	1.79	u	20.0	1.7	u	
Chrysene	ug/kg	5,900	6,400	1,400	2,800	110	460		20.0	1.79	u	20.0	1.7	u	
Total Benzo(b+k)fluoranthenes	ug/kg	600	4,000	3,200	3,600	230	450		20.0	1.79	u	20.0	1.7	u	
Benzo(a)pyrene	ug/kg	3,300	4,800	1,600	1,600	99	210		20.0	1.79	u	20.0	1.7	u	
Indeno(1,2,3-cd)pyrene	ug/kg	4,100	5,300	600	690	34	88		20.0	1.79	u	20.0	1.7	u	
Dibenzo(a,h)anthracene	ug/kg	800	840	230	230	12	33		20.0	1.79	u	20.0	1.7	u	
Benzo(g,h,i)perylene	ug/kg	4,000	5,200	670	720	31	78		20.0	1.79	u	20.0	1.7	u	
1,3-Dichlorobenzene	ug/kg	--	--						2.4		u	2.1		u	
1,4-Dichlorobenzene	ug/kg	--	--	110	110.0	3.1	9		2.4	0.21	u	2.1	0.2	u	
1,2-Dichlorobenzene	ug/kg	--	--	35	50	2.3	2.3		2.4	0.21	u	2.1	0.2	u	
1,2,4-Trichlorobenzene	ug/kg	--	--	31	51	0.81	1.8		12.0	1.07	u	11.0	0.9	u	
Hexachlorobenzne (HCB)	ug/kg	--	--	22	70.0	0.38	2.3	168	20.0	1.79	u	14.0	1.2	y	
Dimethylphthalate	ug/kg	46	440	71	160	53	53		20.0	1.79	u	20.0	1.7	u	
Diethylphthalate	ug/kg	--	--	200	200	61	110		20.0	1.79	u	20.0	1.7	u	
Di-n-butylphthalate	ug/kg	--	--	1,400	1,400	220	1700		20.0	1.79	u	20.0	1.7	u	
Butylbenzylphthalate	ug/kg	260	370	63	900	4.9	64		20.0	1.79	u	20.0	1.7	u	
Bis(2-ethylhexyl)phthalate	ug/kg	220	320	1,300	1,900	47	78		20.0	1.79	u	20.0	1.7	u	
Di-n-octylphthalate	ug/kg	26	45	6,200	6,200	58	4500		20.0	1.79	u	20.0	1.7	u	
Phenol	ug/kg	--	--	420	1,200				20.0		u	20.0		u	
2-Methylphenol	ug/kg	--	--	63	63				20.0		u	20.0		u	
4-Methylphenol	ug/kg	--	--	670	670				20.0		u	20.0		u	
2,4-Dimethylphenol	ug/kg	--	--	29	29				20.0		u	20.0		u	
Pentachlorophenol	ug/kg	--	--	400	690				98.0		u	98.0		u	
Benzyl alcohol	ug/kg	--	--	57	73				49.0		uj	49.0		uj	
Benzoic acid	ug/kg	--	--	650	650				32.0		j	29.0		j	
Dibenzofuran	ug/kg	400	440	540	540	15	58		20.0	1.79	u	20.0	1.7	u	
Hexachloroethane	ug/kg	--	--	--	--	--	--		20.0		u	20.0		u	
Hexachlorobutadiene	ug/kg	--	--	11	120	3.9	6.2		0.97	0.09	u	0.98	0.1	u	
N-Nitrosodiphenylamine	ug/kg	--	--	28	40	11	11		20.0	1.79	u	20.0	1.7	u	

**Table 3. Priest Rapids Recreation Area Project: DMMP Characterization Summary**

CHEMICAL NAME	Units	Sediment Quality Guidelines						Sample ID:	DMMU-1			DMMU-1 (duplicate)		
		Interim Freshwater			Marine Guidelines			DMMU ID:	C1			C1 (duplicate)		
		Guidelines (dry wgt)						Depth (ft BGS)	1-3 ft			1-3 ft		
						(mg/kg-oc-normalized)		DMMP	mg/kg-dry wgt	mg/kg-OC	VQ	mg/kg-dry wgt	mg/kg-OC	VQ
		SL1	SL2	SL1 (dw)	SL2 (dw)	SL1 ((oc)	SL2 (oc)	BT (dry wgt)	DMMP	SMS		DMMP	SMS	
Total DDT (sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT)	ug/kg	--	--	--	--			50	1.9		u	3.2		u
p,p'-DDD	ug/kg	--	--	16	28				1.9		u	2.0		u
p,p'-DDE	ug/kg	--	--	9	9.3				1.9		u	3.2		u
p,p'-DDT	ug/kg	--	--	12	34				1.9		u	2.0		u
Aldrin	ug/kg	--	--	9.5	9.5				0.97		u	0.98		u
Chlordane	ug/kg	--	--	2.8	4.5			37	1.9		u	2.0		u
Dieldrin	ug/kg	--	--	1.9	3.5				1.9		u	2.0		u
Heptachlor	ug/kg	--	--	1.5	2.0				0.97		u	0.98		u
Alpha-BHC	ug/kg	--	--	--	--									
Gamma-BHC (Lindane)	ug/kg	--	--	--	--				8.2		y	4.7		y
<b>Total PCBs</b>	ug/kg	60	120	130	1,000	12	65	38 (oc)	20.0	1.79	u	20.0	1.7	u
<b>Dioxin (TEQ: see Table 5 for detailed results)</b>	mg/kg													
Total Solids	ng/kg								68.5			63.2		
Total Volatile Solids	%													
Total Organic Carbon	%								1.12			1.19		
Total Ammonia	%								6.16			5.28		
Total Sulfides	mg/kg								203			256		
Gravel	mg/kg								69.3			62.7		
Sand	%								17.5			18.1		
Silt	%													
Clay	%													
Fines (percent silt + clay)	%								13.1			19.2		
Bioassay Determination: (P/F)	%								NA			NA		
BTs exceeded:									No			No		
Bioaccumulation conducted:									No			No		
Bioaccumulation Determination: (P/F)														
ML Rule exceeded:									No			No		
<b>PSDDA Determination:</b>									<b>PASS</b>			<b>PASS</b>		
<b>DMMU Volume:</b>									8,000			8,000		
Rank (Low = L, Moderate = M, Low-Moderate =LM, High = H)									LM			LM		
Mean Core sampling depth (ft)	ft								9.0			9.0		
Maximum sampling depth (mudline) (with Z-sample)	ft								9.0			9.0		
<b>DMMU ID:</b>									<b>DMMU-C1</b>			<b>DMMU-C1 (duplicate)</b>		

BGS = Below Ground Surface

**P = Pass (BPJ: Suitable for Beneficial Use)**

**SL1 or SQS = Guideline exceedance (undetected)**

**SL2 = Guideline exceedance (undetected)**

VQ = Validation Qualifier

UCOWD = Unconfined open-water disposal

NA = Not applicable

U = undetected at the reporting limit

J = Estimated Concentration (< reporting limit)

Y = Analyte was not detected at or above the concentration identified due to chromatographic interference