CENWS-OD-TS-DMMO

MEMORANDUM FOR: RECORD December 9, 2009

SUBJECT: DETERMINATION REGARDING THE SUITABILITY OF PROPOSED DREDGED MATERIAL FROM THE PORT OF EVERETT 10TH STREET BOAT LAUNCH, FOR UNCONFINED OPEN-WATER DISPOSAL AT THE PORT GARDNER NONDISPERSIVE SITE.

1. Introduction. This memorandum reflects the consensus determination of the Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Washington Departments of Ecology and Natural Resources, and the Environmental Protection Agency) regarding the suitability of up to 32,000 cubic yards (cy) of dredged material from the Port of Everett 10th Street Boat Launch for disposal at the Port Gardner nondispersive open-water site.

2. Background. The 10th Street Boat Launch, located on the Snohomish River (see Figure 1), was previously characterized in 1992 and 2000 as a moderate-ranked project. It was downranked to "low" as part of a partial characterization completed in September 2009. Dioxin testing was conducted as part of the partial characterization. The concentration in a sample taken from the boat launch area was 1.87 parts per trillion (pptr) toxicity equivalents (TEQs, with undetects = ½ detection limit). This is well below the mean concentration of 4.1 pptr in the vicinity of the Port Gardner disposal site, which is the basis for the current DMMP interim dioxin guideline for suitability at the site. On this basis the DMMP agencies agreed that dioxin testing would not be required during full characterization.

3. Project Summary. Table 1 includes project summary and tracking information.

Table 1. Project Summary

Project ranking	Low
Proposed dredging volume	32,000 cubic yards
Proposed dredging depth	-10 feet MLLW plus 2 feet overdepth
SAP received	September 11, 2009
SAP approved	September 30, 2009
Sampling date	October 8, 2009
Data report received	December 3, 2009
DAIS Tracking number	POE10-1-A-F-280
USACE Permit Application Number	NWS-2009-1245
Recency Determination (low rank = 5 to 7 years)	October 2014 to October 2016

4. Project Ranking and Sampling Requirements. In a low-ranked area the number of samples and analyses are calculated using the following guidelines (DMMP, 2008a):
   - Maximum volume of sediment represented by each field sample = 8,000 cubic yards

- Maximum volume of sediment represented by each analysis in the upper 4-feet of the dredging prism (surface sediment) = 48,000 cubic yards
- Maximum volume of sediment represented by each analysis in the subsurface portion of the dredging prism = 72,000 cubic yards

On the basis of these guidelines, the DMMP agencies allowed the entire project volume to be included in a single dredged material management unit (DMMU), represented by four composited core samples.

5. Sampling. Sampling took place October 8, 2009. A MudMole pneumatic impact core sampler was used and the full depth of sampling, including overdepth and Z-samples, was collected at each of the 4 sampling stations. See Figure 2 for sampling locations and Table 2 for detailed sampling and compositing information.

6. Chemical Analysis. The approved sampling and analysis plan (AMEC, 2009a) was followed and quality control guidelines specified by the PSEP and DMMP programs were generally met. The data were validated by Saylor Data Solutions. Two minor QA problems were encountered. First, recoveries for the matrix spike and matrix spike duplicate for antimony were low and the results were rejected as unusable by the validator. But because antimony was undetected in the sample at a reporting limit of 8 parts per million (ppm) - well below the screening level of 150 ppm – and samples collected previously in the area had not found antimony to be a contaminant of concern, the DMMP agencies determined that it was unlikely that antimony might actually be present at a level of concern. Second, benzyl alcohol was originally detected at a concentration of 82 parts per billion (ppb), which exceeded the screening level of 57 ppb. AMEC Geomatrix, the sampling contractor, reported that thorough homogenization of the composited sediment was difficult and uneven distribution of wood debris within the sample may have biased the initial results (AMEC, 2009b). The DMMP agencies allowed the laboratory to do a second extraction on archived sediment and analyze the extract in duplicate. Benzyl alcohol was undetected in both replicates. The agencies accepted the results from the reanalysis and agreed that biological testing would not be necessary.

   The analytical results can be found in Table 3. The grain-size data show that the proposed dredged material is silty sand. Total organic carbon was a relatively low 1.15 percent. Other than the initial results for benzyl alcohol, the chemical results indicated that there were no exceedances of DMMP screening levels. The dredged material met the suitability guidelines, based on chemistry alone, for open-water disposal at the Port Gardner site.

7. Sediment Exposed by Dredging. Sediment exposed by dredging must either meet the State of Washington Sediment Quality Standards (SQS) (Ecology, 1995) or the State's antidegradation standard (DMMP, 2008b). Comparison of the proposed dredged material to SQS serves as a first-tier indicator for this purpose. Table 4 shows that there were no detected exceedances of SQS. However - while undetected - the reporting limit for hexachlorobenzene exceeded the SQS. The DMMP agencies believe the probability that this reporting-limit exceedance is masking an actual exceedance of SQS is low. Therefore, the exceedance was deemed insignificant and the agencies agreed that there was no need for analysis of Z-samples for this project. The sediment that will be exposed by dredging is not anticipated to have any exceedances of SQS.

8. Suitability Determination. This memorandum documents the evaluation of the suitability of sediment proposed for dredging from the Port of Everett 10th Street Boat Launch for open-water disposal. The approved sampling and analysis plan was followed. The data gathered were deemed sufficient and acceptable for regulatory decision-making under the DMMP program.

   Based on the results of the previously described testing, the DMMP agencies conclude that **all 32,000 cubic yards are suitable** for open-water disposal at the Port Gardner non-dispersive site.

   This suitability determination does ***not*** constitute final agency approval of the project. During the public comment period that follows a public notice, the resource agencies will provide input on the overall project. A final decision will be made after full consideration of agency input, and after an alternatives analysis is done under section 404(b)(1) of the Clean Water Act.

   A pre-dredge meeting with DNR, Ecology and the Corps of Engineers is required. A dredging quality control plan must be developed and submitted to the Regulatory Branch of the Seattle District Corps of Engineers at least 7 days prior to the pre-dredge meeting. A DNR site use authorization must also be acquired.

9. References.

Ecology, 1995. *Sediment Management Standards – Chapter 173-204 WAC*. Washington State Department of Ecology, December 1995.

AMEC, 2009a. *Draft Sampling and Analysis Plan, DMMP Full Characterization for Maintenance Dredging at the Port of Everett's 10th Street Boat Launch, Everett, Washington*. Prepared by AMEC Geomatrix, Lynnwood, Washington for the Port of Everett. September 2009.

AMEC, 2009b. *Data Report, DMMP Full Characterization for Maintenance Dredging at the Port of Everett's 10th Street Boat Launch, Everett, Washington*. Prepared by AMEC Geomatrix, Lynnwood, Washington for the Port of Everett. December 2009.

DMMP, 2008a. *Dredged Material Evaluation and Disposal Procedures (Users Manual)*. Prepared by the Seattle District Dredged Material Management Office for the Dredged Material Management Program, July 2008.

DMMP, 2008b. *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.

10. **Agency Signatures.**

Concur:

12/11/09 — David F. Fox
Date — for Stephanie Stirling - Seattle District Corps of Engineers

12/10/09
Date — Erika Hoffman - Environmental Protection Agency

Dec 10 2009 — Laura Inouye
Date — Laura Inouye, Ph.D. - Washington Department of Ecology

12/10/09
Date — David Vagt - Washington Department of Natural Resources

Copies furnished:

DMMP signatories
Erin Legge, Seattle District Regulatory
Rob Gilmour, AMEC

TABLE 2

SEDIMENT CORE LOCATIONS AND SAMPLE INTERVALS

DMMP Full Characterization for Maintenance Dredging
at the Port of Everett's 10th Street Boat Launch
Everett, Washington

Sediment Boring Number	Date	Time	Station Coordinates				Mudline Elevation (feet MLLW)	Sample Interval Elevation (feet MLLW)	Sample ID
			State Plane Coordinates NAD 83 WA North Zone, Survey Feet		Geographic NAD 83 Degrees-Decimal Minutes				
			Northing	Easting	Latitude (N)	Longitude (W)			
BR-1	10/08/2009	10:50	369709	1300245	48º 00.307240'	122º 13.381404'	-3	-3.0 to -12.0	13116003C-1
								-12 to -13	BR-1
BR-2	10/08/2009	9:13	369712	1300347	48º 00.308061'	122º 13.356451'	-2.7	-2.7 to -12.0	13116003C-1
								-12 to -13	BR-2
BR-3	10/08/2009	11:50	369525	1300241	48º 00.276988'	122º 13.381635'	-4.4	-4.4 to -12.0	13116003C-1
								-12 to -13	BR-3
BR-4	10/08/2009	12:39	369475	1300312	48º 00.268923'	122º 13.364054'	-5.6	-5.6 to -12.0	13116003C-1
								-12 to -13	BR-4

Abbreviation(s)
DMMP = Dredged Material Management Program
ID = identification
MLLW = mean lower low water
NAD = North American Datum

TABLE 3

DMMP CONVENTIONAL AND CONTAMINANT CHEMISTRY RESULTS[1]

DMMP Full Characterization for Maintenance Dredging
at the Port of Everett's 10th Street Boat Launch
Everett, Washington

				Sample ID	13116003C-1		
				DMMU	C-1		
				Sample Type	Composite		
	DMMP			Date	10/08/09		
Parameter	**SL**	**BT**	**ML**		**Value**	**Q1**	**Q2**
Conventionals (%)							
Total Solids	—	—	—		60.9		
Total Volatile Solids	—	—	—		5.7		
Total Organic Carbon	—	—	—		1.15		
N-Ammonia (mg-N/kg)	—	—	—		22.7		
Sulfide (mg/kg)	—	—	—		743		
Grain Size							
Gravel (phi <-1)	—	—	—		0.3		
Very Coarse Sand (phi -1 to 0)	—	—	—		0.9		
Coarse Sand (phi 0 to 1)	—	—	—		1.6		
Medium Sand (phi 1 to 2)	—	—	—		2.9		
Fine Sand (phi 2 to 3)	—	—	—		12.6		
Very Fine Sand (phi 3 to 4)	—	—	—		33.4		
Coarse Silt (phi 4 to 5)	—	—	—		17.6		
Medium Silt (phi 5 to 6)	—	—	—		10.3		
Fine Silt (phi 6 to 7)	—	—	—		6.6		
Very Fine Silt (phi 7 to 8)	—	—	—		3.8		
Clay (phi 8 to 9)	—	—	—		2.8		
Clay (phi 9 to 10)	—	—	—		2.4		
Clay (phi >10)	—	—	—		4.8		
Total Fines (<63 µm)	—	—	—		48.3		
Metals (mg/kg dry wt)							
Antimony	150	—	200		8	U	R
Arsenic	57	507.1	700		11		
Cadmium	5.1	11.3	14		0.5		
Chromium	—	267	—		45.9		
Copper	390	1,027	1,300		50.6		
Lead	450	—	1,200		7		
Mercury	0.41	1.5	2.3		0.07		
Nickel	140	370	370		44		
Silver	6.1	6.1	8.4		0.5	U	
Zinc	410	2,783	3,800		78		

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				Sample ID	13116003C-1		
				DMMU	C-1		
				Sample Type	Composite		
		DMMP		Date	10/08/09		
Parameter	**SL**	**BT**	**ML**		**Value**	**Q1**	**Q2**
Organics (µg/kg dry wt)							
LPAH							
2-Methylnaphthalene	670	—	1,900		20	U	
Acenaphthene	500	—	2,000		20	U	
Acenaphthylene	560	—	1,300		20	U	
Anthracene	960	—	13,000		10	J	
Fluorene	540	—	3,600		20	U	
Naphthalene	2,100	—	2,400		20	U	
Phenanthrene	1,500	—	21,000		26		
Total LPAH	5,200	—	29,000		36	J	
HPAH							
Benzo(a)anthracene	1,300	—	5,100		26	M	
Benzo(a)pyrene	1,600	—	3,600		14	J	
Benzo(g,h,i)perylene	670	—	3,200		20	U	
Benzofluoranthenes	3,200	—	9,900		40		
Chrysene	1,400	—	21,000		59	M	
Dibenzo(a,h)anthracene	230	—	1,900		20	U	
Fluoranthene	1,700	4,600	30,000		230		
Indeno(1,2,3-c,d)pyrene	600	—	4,400		20	U	
Pyrene	2,600	11,980	16,000		120		
Total HPAH	12,000	—	69,000		389	J	
Chlorinated Hydrocarbons							
1,2,4-Trichlorobenzene	31	—	64		6.4	U	
1,2-Dichlorobenzene	35	—	110		1.3	U	UJ
1,3-Dichlorobenzene	170	—	—		1.3	U	UJ
1,4-Dichlorobenzene	110	—	120		1.3	U	UJ
Hexachlorobenzene	22	168	230		20	U	

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DMMP CONVENTIONAL AND CONTAMINANT CHEMISTRY RESULTS[1]

DMMP Full Characterization for Maintenance Dredging
at the Port of Everett's 10th Street Boat Launch
Everett, Washington

				Sample ID	13116003C-1		
				DMMU	C-1		
		DMMP		Sample Type	Composite		
				Date	10/08/09		
Parameter	**SL**	**BT**	**ML**		**Value**	**Q1**	**Q2**
Phthalates							
Bis(2-ethylhexyl)phthalate	1,300	—	8,300		44		
Butyl benzyl phthalate	63	—	970		20	U	
Di-n-butyl phthalate	1,400	—	5,100		20	U	
Di-n-octyl phthalate	6,200	—	6,200		20	U	
Diethyl phthalate	200	—	1,200		20	U	
Dimethyl phthalate	71	—	1,400		20	U	
Phenols							
2 Methylphenol	63	—	77		20	U	
2,4-Dimethylphenol	29	—	210		20	U	
4 Methylphenol	670	—	3,600		20	U	
Pentachlorophenol	400	504	690		98	U	
Phenol	420	—	1,200		20	U	
Miscellaneous Extractables							
Benzoic acid	650	—	760		200	U	UJ
Benzyl alcohol	57	—	870		20	U	
Dibenzofuran	540	—	1,700		20	U	
Hexachlorobutadiene	29	—	270		20	U	
Hexachloroethane	1,400	—	14,000		20	U	
N-Nitrosodiphenylamine	28	—	130		20	U	
Volatile Organics							
Ethylbenzene	10	—	50		1.3	U	UJ
Tetrachloroethene	57	—	210		1.3	U	
Total Xylene	40	—	160		1.3	U	UJ
Trichloroethene	160	—	1,600		1.3	U	

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DMMP CONVENTIONAL AND CONTAMINANT CHEMISTRY RESULTS[1]

DMMP Full Characterization for Maintenance Dredging
at the Port of Everett's 10th Street Boat Launch
Everett, Washington

				Sample ID	13116003C-1		
				DMMU	C-1		
				Sample Type	Composite		
	DMMP			Date	10/08/09		
Parameter	**SL**	**BT**	**ML**		**Value**	**Q1**	**Q2**
Pesticides							
Aldrin	10	—	—		0.97	U	
Chlordane	10	37	—		0.97	U	
Dieldrin	10	—	—		1.9	U	
Heptachlor	10	—	—		0.97	U	
Lindane	10	—	—		0.97	U	
Total DDT	7	50	69		1.9	U	
Total PCBs	130	38[2]	3,100		20	U	

Notes(s)

1. Data qualifiers are as follows.
   J = Estimated value.
   U = Undetected at the reporting limit.
   M = Estimated value for an analyte detected and confirmed but with poor spectral match parameters.
2. BT value for PCBs expressed as parts per million organic carbon.

Abbreviation(s)

BT = bioaccumulation trigger
bgs = below ground surface
DMMP = Dredged Material Management Program
HPAH = high-molecular-weight polycyclic aromatic hydrocarbon
LPAH = low-molecular-weight polycyclic aromatic hydrocarbon
mg/kg dry wt = milligrams per kilogram dry weight
mg-N/kg = milligrams Nitrogen per kilogram
ML = maximum level
PCBs = polychlorinated biphenyls
Q1 = laboratory assigned qualifier
Q2 = qualifier assigned during data validation
SL = screening level
µg/kg dry wt = micrograms per kilgram
µm = micrometers

TABLE 4

SMS CONTAMINANT CHEMISTRY RESULTS

DMMP Full Characterization for Maintenance Dredging
at the Port of Everett's 10th Street Boat Launch
Everett, Washington

			Sample ID	13116003C-1		
			DMMU	C-1		
			Sample Type	Composite		
	SMS		Date	10/08/09		
Parameter	**SQS**	**CSL**		**Value**	**Q1**	**Q2**
Metals (mg/kg dry wt)						
Arsenic	57	93		11		
Cadmium	5.1	6.7		0.5		
Chromium	260	270		45.9		
Copper	390	390		50.6		
Lead	450	530		7		
Mercury	0.41	0.59		0.07		
Silver	6.1	6.1		0.5	U	
Zinc	410	960		78		
Organics						
LPAH (mg/kg OC)						
2-Methylnaphthalene	38	64		1.7	U	
Acenaphthene	16	57		1.7	U	
Acenaphthylene	66	66		1.7	U	
Anthracene	220	1,200		0.9	J	
Fluorene	23	79		1.7	U	
Naphthalene	99	170		1.7	U	
Phenanthrene	100	480		2.3		
Total LPAH	370	780		3.1	J	
HPAH (mg/kg OC)						
Benzo(a)anthracene	110	270		2.3	M	
Benzo(a)pyrene	99	210		1.2	J	
Benzo(g,h,i)perylene	34	88		1.7	U	
Benzofluoranthenes	230	450		3.5		
Chrysene	110	460		5.1	M	
Dibenzo(a,h)anthracene	12	33		1.7	U	
Fluoranthene	160	1,200		20		
Indeno(1,2,3-c,d)pyrene	34	88		1.7	U	
Pyrene	1,000	1,400		10		
Total HPAH	960	5,300		34	J	
Chlorinated Hydrocarbons (mg/kg OC)						
1,2,4-Trichlorobenzene	0.81	1.8		0.56	U	
1,2-Dichlorobenzene	2.3	2.3		0.11	U	UJ
1,4-Dichlorobenzene	3.1	9		0.11	U	UJ
Hexachlorobenzene	0.38	2.3		1.74	U	

TABLE 4

SMS CONTAMINANT CHEMISTRY RESULTS

DMMP Full Characterization for Maintenance Dredging
at the Port of Everett's 10th Street Boat Launch
Everett, Washington

			Sample ID	13116003C-1		
			DMMU	C-1		
			Sample Type	Composite		
	SMS		Date	10/08/09		
Parameter	**SQS**	**CSL**		**Value**	**Q1**	**Q2**
Phthalates (mg/kg OC)						
Bis(2-ethylhexyl)phthalate	47	78		3.8		
Butyl benzyl phthalate	4.9	64		1.7	U	
Di-n-butyl phthalate	220	1,700		1.7	U	
Di-n-octyl phthalate	58	4,500		1.7	U	
Diethyl phthalate	61	110		1.7	U	
Dimethyl phthalate	53	53		1.7	U	
Phenols (ug/kg dry)						
2 Methylphenol	63	63		20	U	
2,4-Dimethylphenol	29	29		20	U	
4 Methylphenol	670	670		20	U	
Pentachlorophenol	360	690		98	U	
Phenol	420	1,200		20	U	
Miscellaneous Extractables (ug/kg dry)						
Benzoic acid	650	650		200	U	UJ
Benzyl alcohol	57	73		20	U	
Miscellaneous Extractables (mg/kg OC)						
Dibenzofuran	15	58		1.7	U	
Hexachlorobutadiene	4	6		1.7	U	
N-Nitrosodiphenylamine	11	11		1.7	U	
PCBs (mg/kg OC)						
Total PCBs	12	65		1.7	U	

Notes(s)

1. Data qualifiers are as follows.
   J = Estimated value.
   U = Undetected at the reporting limit.
   M = Estimated value for an analyte detected and confirmed but with poor spectral match parameters.

Abbreviation(s)

CSL = cleanup screening level
HPAH = high-molecular-weight polycyclic aromatic hydrocarbon
LPAH = low-molecular-weight polycyclic aromatic hydrocarbon
mg/kg dry wt = milligrams per kilogram dry weight
mg/kg OC = milligrams per kilogram organic-carbon normalized
PCBs = polychlorinated biphenyls
Q1 = laboratory assigned qualifier
Q2 = qualifier assigned during data validation
SMS = Sediment Management Standards
SQS = sediment quality standard
µg/kg dry wt = micrograms per kilgram dry-weight normalized

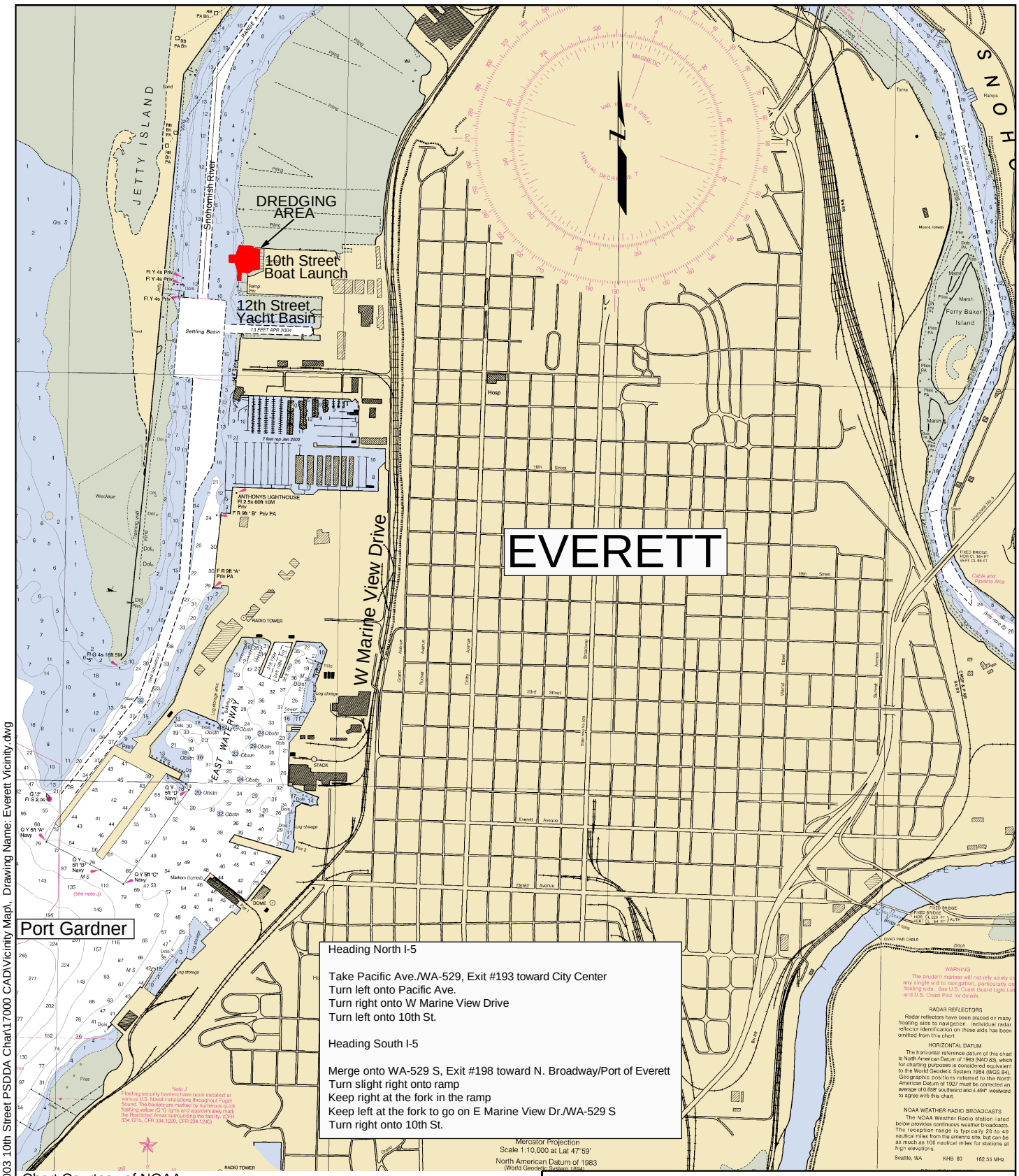


Chart Courtesy of NOAA

48° 00' 17" N,
122° 13' 25" W

Section: 18
Township: 29N
Range: 05E

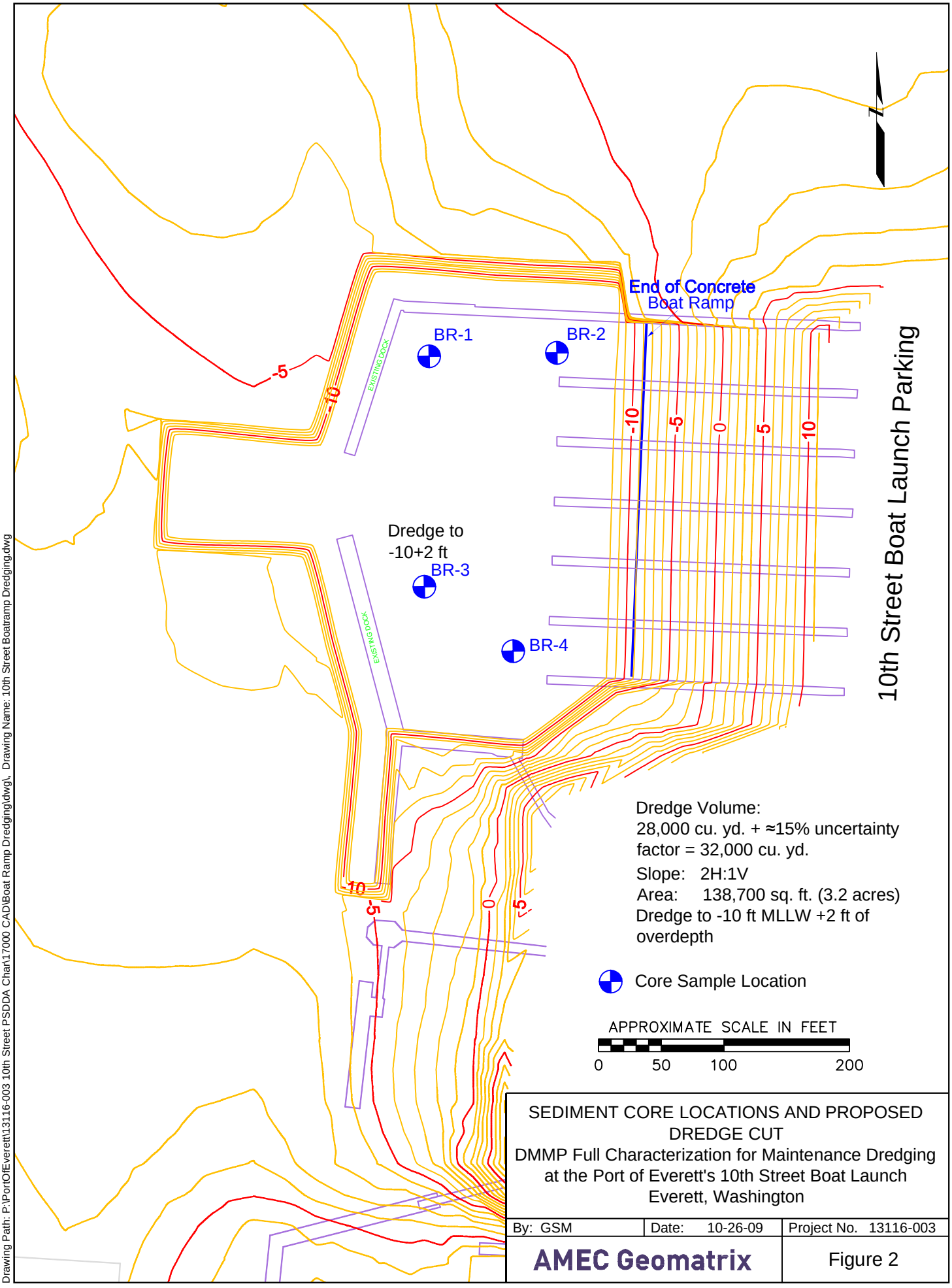
APPROXIMATE SCALE IN FEET

0 1000 2000 4000

PROJECT VICINITY MAP
DMMP Full Characterization for Maintenance Dredging at the Port of Everett's 10th Street Boat Launch Everett, Washington

By: GSM	Date: 10-26-09	Project No. 13116-003
AMEC Geomatrix		Figure 1

Plot Date: 11/28/09 - 6:40pm, Plotted by: gary.maxwell
Drawing Path: P:\PortOfEverett\13116-003 10th Street PSDDA Chan\17000 CAD\Vicinity Map\, Drawing Name: Everett Vicinity.dwg



SEDIMENT CORE LOCATIONS AND PROPOSED DREDGE CUT
DMMP Full Characterization for Maintenance Dredging at the Port of Everett's 10th Street Boat Launch
Everett, Washington

By: GSM	Date: 10-26-09	Project No. 13116-003
AMEC Geomatrix		Figure 2

Plot Date: 10/26/09 - 2:43pm, Plotted by: gary.maxwell
Drawing Path: P:\PortOfEverett\13116-003 10th Street PSDDA Char\17000 CAD\Boat Ramp Dredging\dwg\, Drawing Name: 10th Street Boatramp Dredging.dwg