CENWS-OD-TS-DM

MEMORANDUM FOR RECORD 26 July 2005

SUBJECT: DETERMINATION OF THE SUITABILITY OF SEDIMENT PROPOSED TO BE MAINTENANCED DREDGED FROM POINT HUDSON MARINA, PORT TOWNSEND, WA (#) FOR OPEN-WATER DISPOSAL AT THE PORT TOWNSEND WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES (DNR) OPEN WATER DISPOSAL SITE, AS EVALUATED UNDER SECTION 404 OF THE CLEAN WATER ACT.
Corps application #: 200501237

1. The following summary reflects the consensus determination of the agencies that comprise the regional Dredged Material Management Program (DMMP) for the State of Washington. The agencies include the Corps of Engineers, Department of Ecology, Department of Natural Resources, and the Environmental Protection Agency. The agencies are charged with determining the suitability of proposed dredged material for in-water disposal and have evaluated the proposed maintenance dredging of 10,900 cubic yards from the Point Hudson Marina located in Port Townsend.

2. The project was ranked moderate for testing purposes. The sampling and analysis plan was approved on April 4, 2005 by the DMMP agencies for an estimated total dredged material footprint volume of 10,900 cubic yards. The sampling design called for analyzing 10,900 CY of the proposed maintenance material down to – 11 feet MLLW. Sampling of the proposed maintenance dredging footprint (see figure 1 - 2) was conducted on April 29, 2005, and consisted of collected samples at four locations. The four core station samples (see figure 2) were composited into one dredged materials management unit (DMMU) as follows:

Samples were collected for both chemistry and potential biological testing. A tiered testing approach was used, and all samples for potential biological testing were archived at 4°C pending completion of the chemical analysis.

3. Relevant dates for regulatory tracking purposed are included in Table 1.

Table 1. Regulatory Tracking Information and Dates

| | |
|---|---|
| SAP submittal date: | March 21, 2005 |
| SAP Approval letter date: | April 15, 2005 |
| Sampling date(s): | April 29, 2005 |
| Sediment data characterization report submittal date: | June 29, 2005 |
| DAIS Tracking Number | PHMPT-1-A-F-216 |
| **Recency Determination Date: Moderate** (5 years) | July 2010 |

4. The sampling and Analysis Plan approved by the agencies for testing for the one DMMU was followed, and quality assurance/quality control guidelines specified by the PSDDA Users Manual were generally complied with. The data gathered were deemed sufficient and acceptable for decision-making by the DMMP agencies based on best professional judgment and current program guidelines.

5. Site conditions required modification to the original compositing and analysis approach in consultation with DMMO. Recovery was poor due to the presence of highly compacted sands at locations S2, S3, and S4. Therefore collection of sediment to project depth was not possible. The sampling approach was modified and one composite was created. Sediment from the following cores and intervals were combined to form composite sample PH1-CMP1: S1-A 9-8.3 to -11.0), S2-A (-3.0 to -8.0), S3-A (-5.2 to -9.2), and S4-A (-0.8 to -5.8).

6. Chemical analysis of the DMMU indicated that there were no detected or detection limit exceedences of screening level for all chemicals of concern. Table 2 provides a complete dry weight chemical analysis inventory for the DMMU analyzed. There were no bioaccumulation trigger (BT) or maximum level (ML) exceedances of COCs analyzed. Because there were no SL guideline exceedances, biological testing was not required. Table 3 provides an analysis summary of the results of the conventional parameters analyzed for the composite DMMU.

7. The results of the chemical analysis for the composite DMMU sample representing a total of 10,900 CY of potential dredged material is determined to be suitable for unconfined open-water disposal at DNR approved disposal site.

8. This memorandum documents the suitability of sediment to be dredged from the Point Hudson Marina maintenance dredging project for disposal at a DNR approved dispersive open-water 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.

Concur:

8/8/05
Date

Gwyn Puckett, Seattle District Corps of Engineers

8/8/05
Date

Erika Hoffman, Environmental Protection Agency

8/2/05
Date

Cinde Donoghue, Washington Department of Ecology

8/8/2005
Date

Peter Leon, Washington Department of Natural Resources

**Copies Furnished:**
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Jonathan Freedman, EPA
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Cinde Donoghue, Ecology
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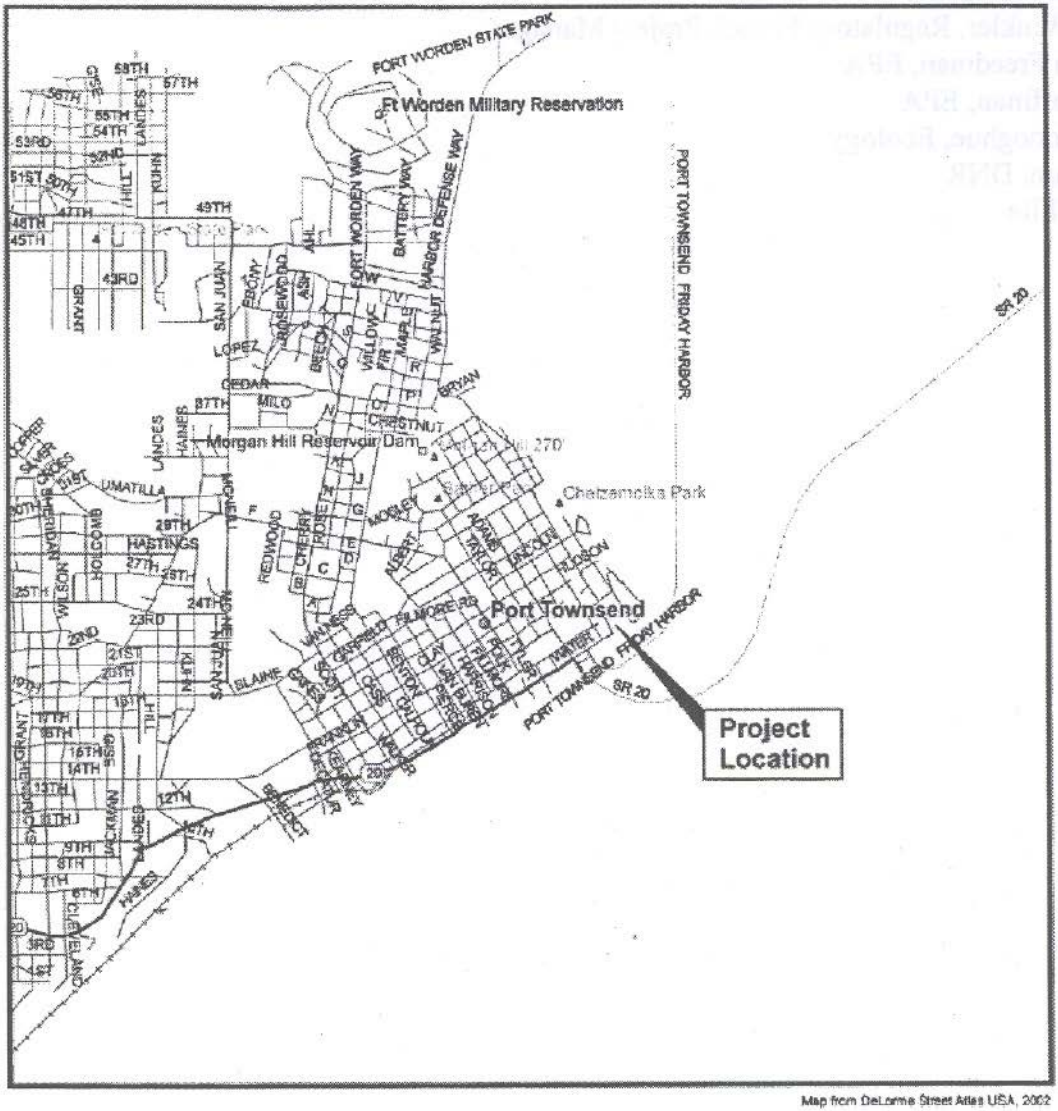
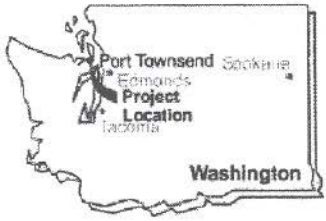
DMMO File




Map from DeLorme Street Atlas USA, 2002

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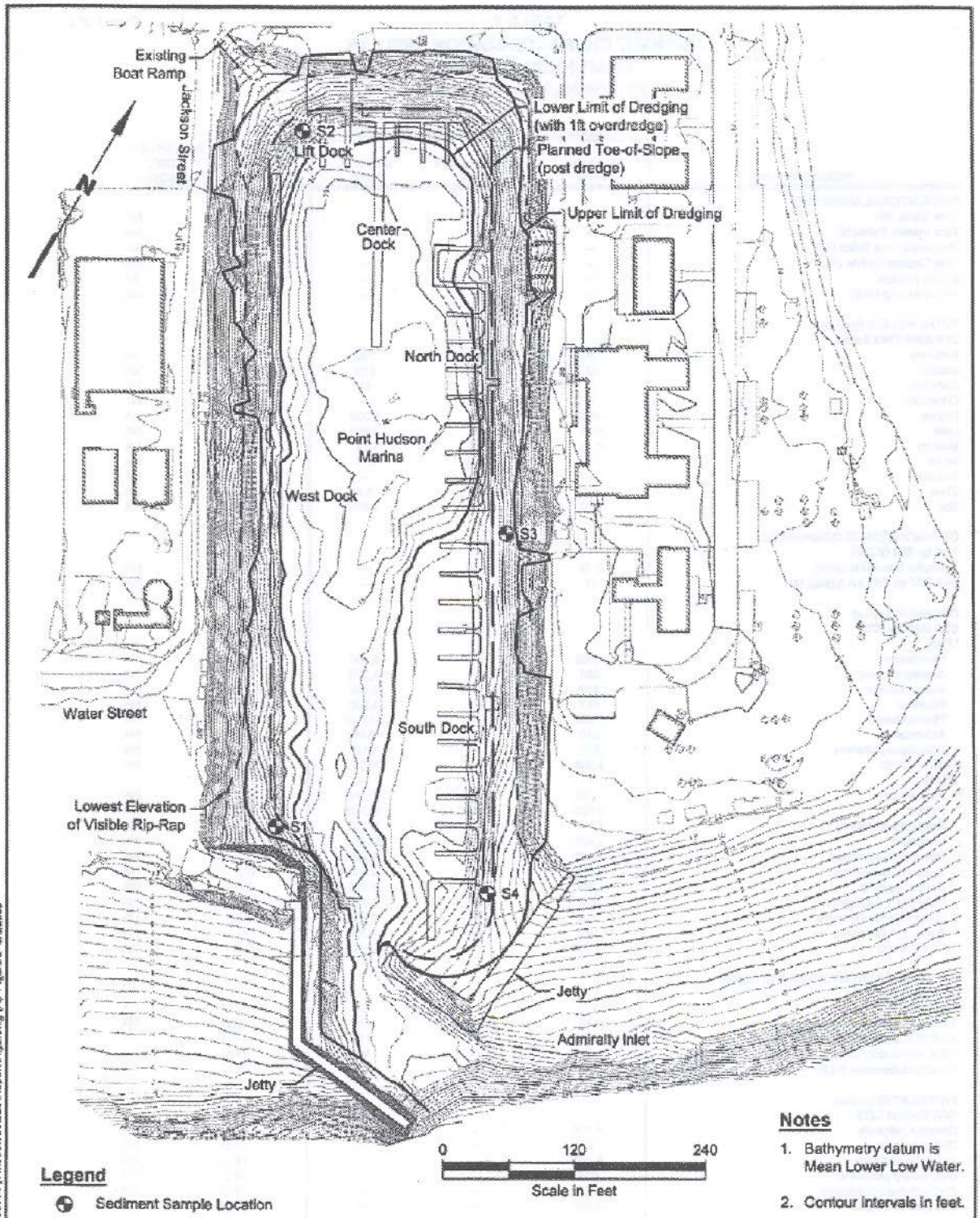
Scale in Miles

Point Hudson | X:\053\083\025\Report\Fig1.cdr 8/21/2005

LANDAU ASSOCIATES

| Point Hudson Marina<br>Port of Port Townsend<br>Port Townsend, Washington | Vicinity Map | Figure<br>1 |
|---|---|---|




*Base map source: Reid Middleton, March 1, 2005*

Point Hudson | X:\0530083\025\Report\Fig2.dwg (A) "Figure 2" 6/2/2005

LANDAU ASSOCIATES

| Point Hudson Marina<br>Port of Port Townsend<br>Port Townsend, Washington | **Sediment Sampling Locations** | Figure<br>2 |
|---|---|---|

# TABLE 2
# SEDIMENT CHARACTERIZATION RESULTS
# POINT HUDSON MARINA
# PORT TOWNSEND, WASHINGTON

| PSDDA Chemical | PSDDA Criteria (Updated with 2003 COC Table) Screening Level | Bioaccumulation Trigger | Maximum Level | PH1-CMP1 HZ97B 4/29/2005 | S4-A (PH-S4) HZ97C 4/29/2005 |
|---|---|---|---|---|---|
| **CONVENTIONAL CHEMISTRY** | | | | | |
| Total Solids (%) | — | — | — | 85.50 | NA |
| Total Volatile Solids(%) | — | — | — | 1.38 | NA |
| Preserved Total Solids (%) | — | — | — | 81.30 | NA |
| Total Organic Carbon (%) | — | — | — | 1.02 | NA |
| Sulfide (mg/kg) | — | — | — | NA | 95 |
| Ammonia (mg-N/kg) | — | — | — | 0.88 | NA |
| **TOTAL METALS (mg/kg)** | | | | | |
| **EPA 6000/7000 Series** | | | | | |
| Antimony | 150 | 150 | 200 | 6 UJ | NA |
| Arsenic | 57 | 507.1 | 700 | 6 U | NA |
| Cadmium | 5.1 | — | 14 | 0.2 U | NA |
| Chromium | — | 267 | — | 20.7 | NA |
| Copper | 390 | — | 1,300 | 15.2 | NA |
| Lead | 450 | — | 1,200 | 7 | NA |
| Mercury | 0.41 | 1.5 | 2.3 | 0.04 U | NA |
| Nickel | 140 | 370 | 370 | 35 | NA |
| Selenium | — | 3 | — | 0.6 U | NA |
| Silver | 6.1 | 8.1 | 8.4 | 0.3 U | NA |
| Zinc | 410 | — | 3,800 | 33.1 J | NA |
| **ORGANOMETALLIC COMPOUNDS:** | | | | | |
| **TBT by SIM GC/MS** | | | | | |
| Tributyltin (interstitial water) | 0.15 | 0.15 | — | NA | NA |
| Bulk TBT as TBT Ion (µg/kg) (a) | 73 | — | — | 9.7 | NA |
| **ORGANICS (µg/kg)** | | | | | |
| **EPA Method 8720** | | | | | |
| LPAH | | | | | |
| Naphthalene | 2,100 | — | 2,400 | 19 U | NA |
| Acenaphthylene | 560 | — | 1,300 | 19 U | NA |
| Acenaphthene | 500 | — | 2,000 | 19 U | NA |
| Fluorene | 540 | — | 3,600 | 21 | NA |
| Phenanthrene | 1,500 | — | 21,000 | 110 | NA |
| Anthracene | 960 | — | 13,000 | 72 | NA |
| 2-Methylnaphthalene | 670 | — | 1,900 | 19 U | NA |
| Total LPAH (b) | 5,200 | — | 29,000 | 203 | NA |
| HPAH | | | | | |
| Fluoranthene | 1,700 | 4,600 | 30,000 | 330 | NA |
| Pyrene | 2,600 | 11,980 | 16,000 | 360 | NA |
| Benzo(a)anthracene | 1,300 | — | 5,100 | 220 | NA |
| Chrysene | 1,400 | — | 21,000 | 870 | NA |
| Benzo(b)fluoranthene | 3,200 | — | 9,900 | 310 | NA |
| Benzo(k)fluoranthene | 3,200 | — | 9,900 | 200 | NA |
| Benzo(a)pyrene | 1,600 | — | 3,600 | 160 | NA |
| Indeno(1,2,3-c,d)pyrene | 600 | — | 4,400 | 52 | NA |
| Dibenzo(a,h)anthracene | 230 | — | 1,900 | 30 | NA |
| Benzo(g,h,i)perylene | 670 | — | 3,200 | 44 | NA |
| Total HPAH (c) | 12,000 | — | 69,000 | 2576 | NA |
| **CHLORINATED HYDROCARBONS (µg/kg)** | | | | | |
| **EPA Method 8270** | | | | | |
| 1,3-Dichlorobenzene | 170 | — | — | 19 U | NA |
| 1,4-Dichlorobenzene | 110 | — | 120 | 19 U | NA |
| 1,2-Dichlorobenzene | 35 | — | 110 | 19 U | NA |
| 1,2,4-Trichlorobenzene | 31 | — | 64 | 19 U | NA |
| Hexachlorobenzene (HCB) | 22 | 168 | 230 | 19 U | NA |
| **PHTHALATES (µg/kg)** | | | | | |
| **EPA Method 8270** | | | | | |
| Dimethyl phthalate | 1,400 | — | — | 19 U | NA |
| Diethyl phthalate | 1,200 | — | — | 19 U | NA |
| Di-n-butyl phthalate | 5,100 | — | — | 19 U | NA |
| Butyl benzyl phthalate | 970 | — | — | 19 U | NA |
| Bis(2-ethylhexyl)phthalate | 8,300 | — | — | 19 U | NA |
| Di-n-octyl phthalate | 6,200 | — | — | 19 U | NA |

# TABLE 2
## SEDIMENT CHARACTERIZATION RESULTS
## POINT HUDSON MARINA
## PORT TOWNSEND, WASHINGTON

| PSDDA Chemical | PSDDA Criteria (Updated with 2003 COC Tests) Screening Level | Bioaccumulation Trigger | Maximum Level | PH1-CMP1 HZ97B 4/29/2005 | S4-A (PH-S4) HZ97C 4/29/2005 |
|---|---|---|---|---|---|
| **PHENOLS (µg/kg)** | | | | | |
| **EPA Method 8270** | | | | | |
| Phenol | 420 | — | 1,200 | 19 U | NA |
| 2 Methylphenol | 63 | — | 77 | 19 U | NA |
| 4 Methylphenol | 670 | — | 3,600 | 19 U | NA |
| 2,4-Dimethylphenol | 29 | — | 210 | 19 U | NA |
| Pentachlorophenol | 400 | 504 | 690 | 96 U | NA |
| **MISCELLANEOUS EXTRACTABLES (µg/kg)** | | | | | |
| **EPA Method 8270** | | | | | |
| Benzyl alcohol | 57 | — | 870 | 19 U | NA |
| Benzoic acid | 650 | — | 760 | 190 U | NA |
| Dibenzofuran | 540 | — | 1,700 | 19 U | NA |
| Hexachloroethane | 1,400 | — | 14,000 | 19 U | NA |
| Hexachlorobutadiene | 29 | — | 270 | 19 U | NA |
| N-Nitrosodiphenylamine | 28 | — | 130 | 19 U | NA |
| **VOLATILE ORGANICS (µg/kg)** | | | | | |
| **EPA Method 8260** | | | | | |
| Trichloroethene | 160 | — | 1,600 | NA | 1.0 U |
| Tetrachloroethene | 57 | — | 210 | NA | 1.0 U |
| Ethylbenzene | 10 | — | 50 | NA | 1.0 U |
| Total Xylene | 40 | — | 160 | NA | 1.0 U |
| **PESTICIDES (µg/kg)** | | | | | |
| **EPA Method 8081** | | | | | |
| Total DDT | 6.9 | 50 | 69 | 1.9 U | NA |
| 4,4'-DDE | — | — | — | 1.9 U | NA |
| 4,4'-DDD | — | — | — | 1.9 U | NA |
| 4,4'-DDT | — | — | — | 1.9 U | NA |
| Aldrin | 10 | — | — | 0.96 U | NA |
| alpha-Chlordane | 10 | 37 | — | 0.96 U | NA |
| gamma-Chlordane | 10 | 37 | — | 0.96 U | NA |
| Dieldrin | 10 | — | — | 1.9 U | NA |
| Heptachlor | 10 | — | — | 0.96 U | NA |
| alpha-BHC | — | 10(a) | — | 0.96 U | NA |
| Lindane | 10 | — | — | 0.96 U | NA |
| **POLYCHLORINATED BIPHENYLS (µg/kg)** | | | | | |
| **EPA Method 8082** | | | | | |
| Aroclor 1016 | — | — | — | 9.6 U | NA |
| Aroclor 1242 | — | — | — | 9.6 U | NA |
| Aroclor 1248 | — | — | — | 9.6 U | NA |
| Aroclor 1254 | — | — | — | 9.6 U | NA |
| Aroclor 1260 | — | — | — | 9.6 U | NA |
| Aroclor 1221 | — | — | — | 9.6 U | NA |
| Aroclor 1232 | — | — | — | 9.6 U | NA |
| Total PCBs (dry weight) | 130 | | 3,100 | 9.6 U | NA |
| Total PCBs (carbon normalized) (d) | — | 38 (a) | — | 0.941 U | NA |

Notes:
All values are dry-weight-based unless otherwise noted.
NA = The compound was not analyzed for in this sample.
U = The compound was not detected above laboratory reporting limits.
UJ = The compound was not detected in the sample; the sample reporting limit is an estimate.
J = The compound was positively identified; the associated value is the approximate concentration in the sample.
(a) Due to sample characteristics, bulk tributyltin (TBT) analysis was performed (see text). The screening level provided is the former en PSDDA SL on a dry-weight basis.
(b) Total LPAH represents the sum of the detects of the following "low molecular weight polynuclear aromatic hydrocarbon" compounds: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene. The LPAH criterion is not the sum of the criteria values for the individual LPAH compounds listed.
(c) Total HPAH represents the sum of the detects of the following "high molecular weight polynuclear aromatic hydrocarbon" compounds: fluoranthene, pyrene, benzo(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene. The HPAH criterion is not the sum of the criteria values for the individual HPAH compounds as listed.
(d) Value is normalized to total organic carbon (TOC) and is expressed in mg/kg TOC.

**Table 3. DMMP Testing Summary for Point Hudson Marina**

| Conventional Chemistry | DMMU | PH1-CMP1 |
|---|---|---|
| | Rank | M |
| | Units | Conc. |
| Total Solids | % | 85.50 |
| Total Volatile Solids | % | 1.38 |
| Preserved Total Solids | % | 81.30 |
| Total Organic Carbon | % | 1.02 |
| Total Ammonia | mg-N/kg | 0.68 |
| Total Sulfides | mg/kg | NA |
| Sand and Gravel (percent) | % | 40 |
| Silt (percent) | % | 46 |
| Clay (percent) | % | 14 |
| Fines (percent silt + clay) | % | 60 |
| *Eohaustorius estuaries* hits: | | NA |
| *Mytilus galloprovincialis hits:* | | NA |
| *Neanthes areaceodentata hits:* | | NA |
| Bioassay Pass/Fail: | | NA |
| BTs exceeded: | | no |
| Bioaccumulation conducted: | | no |
| Bioaccumulations Pass/Fail: | | NA |
| ML Rule exceeded: | | no |
| PSDDA Determination: | | |
| DMMU Volume: | CY | 10,900 |
| DMMU ID: | | PH1-CMP1 |

**Table 4. Sampling Station Boring Depths and Elevations**

| Sampling Station Number | Mudline Elevation (MLLW) | Recovered Elevation (MLLW) | Subsample Intervals, Designations, and Elevations |
|---|---|---|---|
| S1 | -8.3 | -12.0 | -8.3 to -11 |
| S2 | -3.0 | -8.9 | -3.0 to -8.0 |
| S3 | -5.2 | -10.1 | -5.2 to -9.2 |
| S4 | -0.8 | -6.7 | -0.8 to -5.8 |