

## MEMORANDUM FOR RECORD

**SUBJECT:** DETERMINATION REGARDING THE SUITABILITY OF PROPOSED DREDGED MATERIAL FROM MURPHY'S LANDING MARINA AT GIG HARBOR WASHINGTON FOR BENEFICIAL USE OR UNCONFINED OPEN WATER DISPOSAL AT THE COMMENCEMENT BAY OPEN WATER DISPOSAL 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 U.S. Environmental Protection Agency) regarding the suitability of up to 4000 cubic yards of dredged material from Murphy's Landing Marina for beneficial use or disposal at the Commencement Bay open-water disposal site.

**2. Background.** Murphy's Landing Marina is located at Gig Harbor Washington. Marinas are ranked moderate under DMMP guidelines. The marina is used by recreational boaters for moorage. The applicant is proposing to dredge and remove accumulated sediment to maintain -10 feet MLLW depth to accommodate marina boating activities.

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

Table 1. Project Summary

|   |                                  |
|---|----------------------------------|
| Project ranking                                 | Moderate                         |
| Proposed Dredging volume                        | Up to 4,000 cubic yards          |
| Proposed Dredging depth                         | -10 feet MLLW                    |
| SAP Received                                    | 21 August 2008                   |
| SAP Approved                                    | 11 September 2008                |
| Sampling Dates                                  | 8 January 2009                   |
| Data report received                            | 4 April 2009                     |
| DAIS Tracking Number                            | MUMAR-1-A-F-271                  |
| USACE Permit Application Number                 | NWS-2009-                        |
| Recency Determination (Moderate = 5 to 7 Years) | 9 January 2014 – 21 January 2016 |

**4. Project Sampling.** Core samples were taken from two locations using a vibracore, and composited for one analysis. Samples were composited vertically as well as horizontally since the proposed prism is 4 feet in depth. Z-samples were also collected from both core locations. The sampling and compositing scheme is outlined in Table 2. Sample locations are illustrated in Figure 1.

**5. Chemical Analysis.** Sediments were evaluated for the standard list of DMMP chemicals of concern. Due to a lab miscommunication, volatiles were not analyzed within the holding time. The DMMP agencies reviewed the issue, and determined that volatiles were not of high concern in the area. Sediment conventional results are listed in Table 3.

There were no exceedances of DMMP screening guidelines. Bioassay testing was not required.

The approved sampling and analysis plan was followed and quality control guidelines specified by the PSEP and DMMP guidelines were met. The data were considered sufficient and acceptable for regulatory decision-making.

**6. Suitability Determination.** This memorandum documents the evaluation of the suitability of sediment proposed for dredging from Murphy's Landing Marina 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.

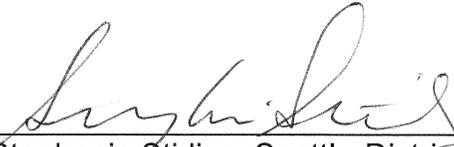
Based on the results of the previously described testing, the DMMP agencies conclude that up to **4,000 cubic yards are suitable** for open-water disposal at the Commencement Bay open water disposal site. This suitability determination does ***not*** constitute final agency approval of the project. A completed JARPA application must be submitted to all DMMP agencies. 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, Corps of Engineers and Washington Department of Ecology will be 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.*

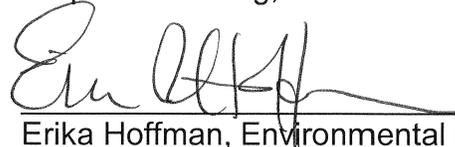
**8. Agency Signatures.**

Concur:

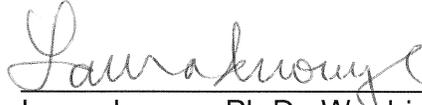
6/3/09  
Date

  
Stephanie Stirling, Seattle District Corps of Engineers

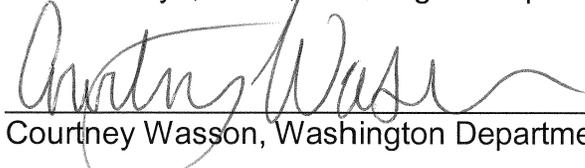
6/4/09  
Date

  
Erika Hoffman, Environmental Protection Agency

6/4/09  
Date

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

6/4/09  
Date

  
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**Table 2. Sediment Compositing Scheme**

| DMMU Number | Sample Core Sections | DMMU Volume |
|-------------|----------------------|-------------|
| 1           | 1-1, 1-2<br>2-1, 2-2 | 4,000       |

**Table 3. Sediment  
 Conventional Data.**

|                              |                         | DMMU<br>1 |
|------------------------------|-------------------------|-----------|
| <b>DAIS ID:</b>              |                         | C1        |
| <b>GRAIN<br/>SIZE</b>        | % Gravel:               | 55.0      |
|                              | % Sand:                 | 12.0      |
|                              | % Silt:                 | 6.2       |
|                              | % Clay:                 | 28.0      |
|                              | % Fines<br>(clay+silt): | 34.2      |
| Total Solids (%):            |                         | 75        |
| Volatile Solids (%):         |                         | 25        |
| Total Organic Carbon<br>(%): |                         | 1.42      |
| Total Sulfides (mg/kg):      |                         | ND        |
| Total Ammonia (mg<br>N/kg):  |                         | 32        |

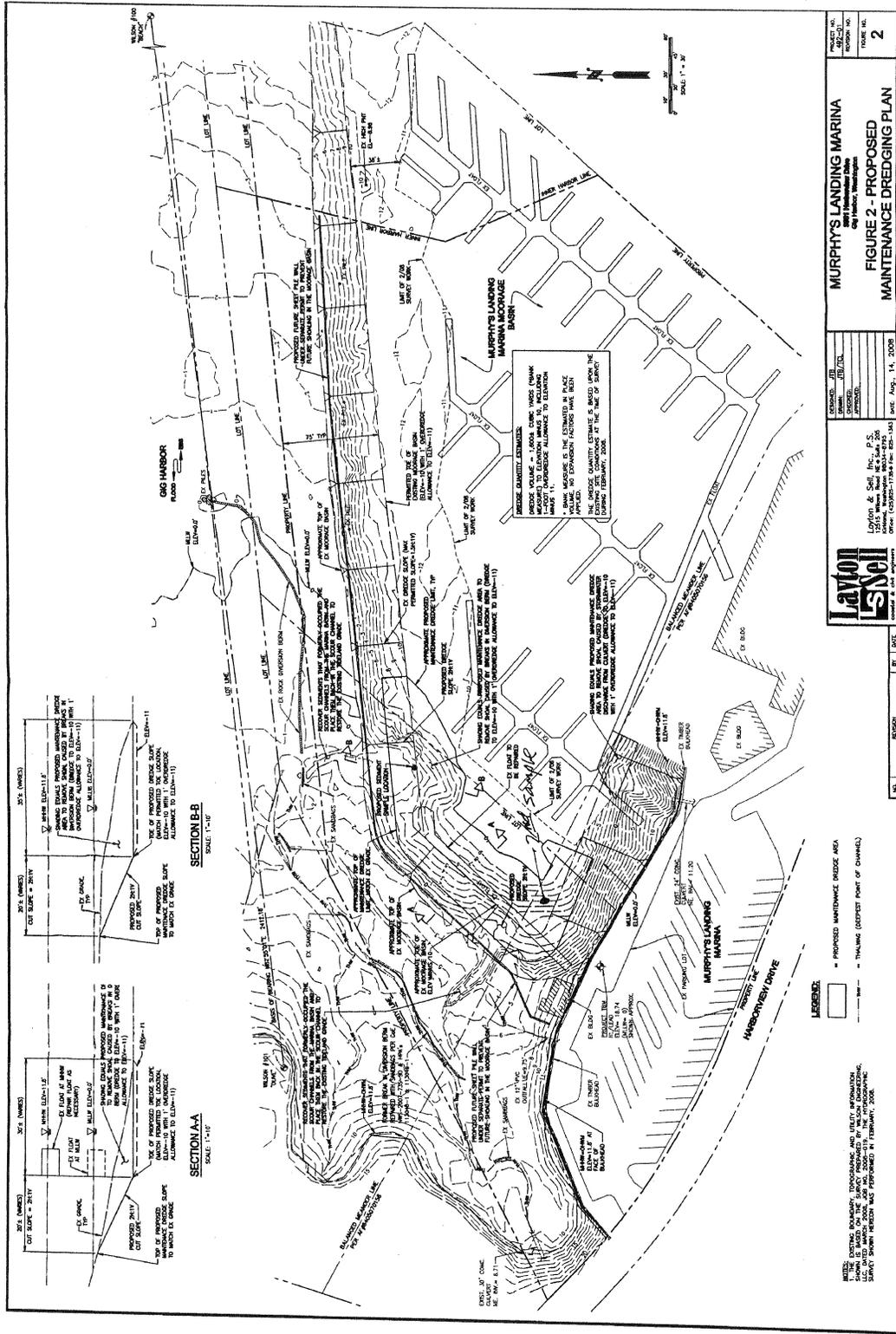


Figure 1.

**Table 4. Chemical results compared to DMMP regulatory guidelines.**

| CHEMICAL                                    | SL     | BT     | ML     | DMMU 1      |           |
|---|--------|--------|--------|-------------|-----------|
| <b>METALS (mg/kg dry)</b>                   |        |        |        | <b>conc</b> | <b>QL</b> |
| Antimony                                    | 150    | ---    | 200    | 0.22        | u         |
| Arsenic                                     | 57     | 507    | 700    | 2.2         |           |
| Cadmium                                     | 5.1    | 11.3   | 14     | 0.12        |           |
| Chromium                                    | ---    | 267    | ---    | 28          |           |
| Copper                                      | 390    | 1,027  | 1,300  | 14          |           |
| Lead  | 450    | 975    | 1,200  | 2.8         |           |
| Mercury                                     | 0.41   | 1.5    | 2.3    | 0.016       |           |
| Nickel                                      | 140    | 370    | 370    | 32          |           |
| Selenium                                    | ---    | 3.0    | ---    | 0.11        |           |
| Silver                                      | 6.1    | 6.1    | 8.4    | 1.2         | u         |
| Zinc  | 410    | 2,783  | 3,800  | 33          |           |
| <b>Organometallic Compounds</b>             |        |        |        |             |           |
| Tributyltin (ug/kg dry)                     | na     |        |        |             |           |
| <b>LPAH (ug/kg dry)</b>                     |        |        |        |             |           |
| 2-Methylnaphthalene                         | 670    | ---    | 1,900  | 7.3         |           |
| Acenaphthene                                | 500    | ---    | 2,000  | 13          |           |
| Acenaphthylene                              | 560    | ---    | 1,300  | 8.4         |           |
| Anthracene                                  | 960    | ---    | 13,000 | 42          |           |
| Fluorene                                    | 540    | ---    | 3,600  | 43          |           |
| Naphthalene                                 | 2,100  | ---    | 2,400  | 10          |           |
| Phenanthrene                                | 1,500  | ---    | 21,000 | 140         |           |
| Total LPAH                                  | 5,200  | ---    | 29,000 | 267.3       |           |
| <b>HPAH (ug/kg dry)</b>                     |        |        |        |             |           |
| Benzo(a)anthracene                          | 1,300  | ---    | 5,100  | 160         |           |
| Benzo(a)pyrene                              | 1,600  | ---    | 3,600  | 110         |           |
| Benzo(g,h,i)perylene                        | 670    | ---    | 3,200  | 36          |           |
| Benzo(a)fluoranthene                        | 3,200  | ---    | 9,900  | 290         |           |
| Chrysene                                    | 1,400  | ---    | 21,000 | 260         |           |
| Dibenzo(a,h)anthracene                      | 230    | ---    | 1,900  | 14          |           |
| Fluoranthene                                | 1,700  | 4,600  | 30,000 | 680         |           |
| Indeno(1,2,3-c,d)pyrene                     | 600    | ---    | 4,400  | 37          |           |
| Pyrene                                      | 2,600  | 11,980 | 16,000 | 490         |           |
| Total HPAH                                  | 12,000 | ---    | 69,000 | 2077        |           |
| <b>CHLORINATED HYDROCARBONS (ug/kg dry)</b> |        |        |        |             |           |
| 1,2,4-Trichlorobenzene                      | 31     | ---    | 64     | 1.2         | u         |
| 1,2-Dichlorobenzene                         | 35     | ---    | 110    | 0.63        | u         |
| 1,3-Dichlorobenzene                         | 170    | ---    | ---    | 0.71        | u         |
| 1,4-Dichlorobenzene                         | 110    | ---    | 120    | 0.71        | u         |
| Hexachlorobenzene                           | 22     | 168    | 230    | 0.38        | u         |
| <b>PHTHALATES (ug/kg dry)</b>               |        |        |        |             |           |
| Bis(2-ethylhexyl)phthalate                  | 1,300  | ---    | 8,300  | 21          |           |
| Butyl benzyl phthalate                      | 63     | ---    | 970    | 6.8         |           |
| Di-n-butyl phthalate                        | 1,400  | ---    | 5,100  | 5.6         |           |

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|   |       |     |        |      |   |
|---|-------|-----|--------|------|---|
| Di-n-octyl phthalate                          | 6,200 | --- | 6,200  | 0.13 |   |
| Diethyl phthalate                             | 200   | --- | 1,200  | 1.5  |   |
| Dimethyl phthalate                            | 71    | --- | 1,400  | 2.1  |   |
| <b>PHENOLS (ug/kg dry)</b>                    |       |     |        |      |   |
| 2 Methylphenol                                | 63    | --- | 77     | 0.7  | u |
| 2,4-Dimethylphenol                            | 29    | --- | 210    | 0.21 | u |
| 4 Methylphenol                                | 670   | --- | 3,600  | 0.56 | u |
| Pentachlorophenol                             | 400   | 504 | 690    | 3.7  |   |
| Phenol  | 420   | --- | 1,200  | 0.73 | u |
| <b>MISCELLANEOUS EXTRACTABLES (ug/kg dry)</b> |       |     |        |      |   |
| Benzoic acid                                  | 650   | --- | 760    | 120  |   |
| Benzyl alcohol                                | 57    | --- | 870    | 0.95 | u |
| Dibenzofuran                                  | 540   | --- | 1,700  | 7.6  |   |
| Hexachlorobutadiene                           | 29    | --- | 270    | 0.9  | u |
| Hexachloroethane                              | 1,400 | --- | 14,000 | 1.1  | u |
| N-Nitrosodiphenylamine                        | 28    | --- | 130    | 0.52 |   |
| <b>VOLATILE ORGANICS (ug/kg dry) (1)</b>      |       |     |        |      |   |
| Ethylbenzene                                  | 10    | --- | 50     |      |   |
| Tetrachloroethene                             | 57    | --- | 210    |      |   |
| Total Xylene                                  | 40    | --- | 160    |      |   |
| Trichloroethene                               | 160   | --- | 1,600  |      |   |
| <b>PESTICIDES AND PCBs (ug/kg dry)</b>        |       |     |        |      |   |
| Aldrin  | 10    | --- | ---    | 0.22 | u |
| Chlordane                                     | 10    | 37  | ---    | 0.13 | u |
| Dieldrin                                      | 10    | --- | ---    | 0.12 | u |
| Heptachlor                                    | 10    | --- | ---    | 0.46 | u |
| Lindane                                       | 10    | --- | ---    | 0.78 | u |
| Total DDT                                     | 6.9   | 50  | 69     | 1.1  |   |
| Total PCBs                                    | 130   | --- | 3,100  | 4.1  | u |
| Total PCBs (mg/kg OC)                         | ---   | 38  | ---    |      |   |

u = undetected

(1) Volatiles analyses were omitted from this project

QL = laboratory qualifier

OC = organic carbon

SL = screening level

BT = bioaccumulation trigger

ML = maximum level