DMMP Clarification Paper **May 1, 2015**

Debris Screening Requirements for Dredged Material Disposed at Open-Water Sites

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Introduction

The Washington State Legislature has mandated the Department of Natural Resources (DNR) to provide, manage and monitor aquatic land disposal sites (RCW 79.105.500). DNR has demonstrated its commitment to protecting the aquatic environment through stringent oversight of all disposal activities occurring on state-owned aquatic lands. DNR, in conjunction with the other Dredged Material Management Program (DMMP) agencies, accomplishes this by requiring dredged material taken to the eight open-water disposal sites in Puget Sound as well as estuarine disposal sites in Grays Harbor and Willapa Bay, be evaluated for toxicity and bioaccumulation potential. Each barge load of dredged material is also subject to DNR reporting requirements. Furthermore, all dredged material proposed for disposal must meet the approval of federal and state agencies through their regulatory permits. DNR may require disposers to correct, at their expense, any failure to comply with those permits in their use of the disposal site through the DNR Site Use Authorization (SUA) Section 4.04.

Current Restrictions on Disposal of Debris at Open Water Sites

Only approved dredged material is allowed for disposal at open-water sites. The Clean Water Act regulations define dredged material as "material that is excavated or dredged from the waters of the United States" (40 CFR 232.2), and the Ocean Disposal Regulations similarly define it as "bottom sediments or materials that have been dredged or excavated from navigable waters of the United States…Dredged material consists primarily of natural sediments or materials…" (40 CFR 227.13). The Puget Sound Dredged Disposal Analysis (PSDDA) Evaluation Procedures Technical Appendix (PSDDA, 1988) provides a similar definition in its glossary: "sediments excavated from the bottom of a waterway or water body". The DMMP User Manual (UM) discusses debris restrictions at the open water disposal sites as follows (DMMP, 2014):

> "In general, debris is not allowed to be disposed at the DMMP open-water sites. This includes all floatable debris and large non-floatable debris such as logs, piling, rip-rap and concrete. Occasionally it may include smaller non-floatable woody debris such as sawdust, bark or wood chips, if these are inseparable from the sediment and are present in small enough proportion (less than 50% by volume). Large woody debris is most often segregated from sediment using a clamshell bucket during the dredging

> operation. In cases where a heterogeneous mix of smaller woody debris and sediment exists, which otherwise meets DMMP disposal guidelines, open-water disposal may occur as long as none of the debris measures more than two feet in its longest dimension. Occasionally, a relatively small quantity of rip-rap may be approved for open-water disposal. However, a 2-ft by 2-ft steel mesh must be used during the dredging operation to remove larger pieces of rip-rap."

Note that other than piling and rip-rap, the UM debris definition does not explicitly include anthropogenically-derived debris such as rebar, tires, and creosoted/treated wood. DNR's site use authorization contract (SUA 2.01) only allows "disposal of approved dredged material", which means that disposal of anthropogenically-derived debris, regardless of type or size, is implicitly prohibited. A penalty fee may be charged for dumping of "materials not approved for open water disposal" (SUA 4.07).

The basis for the UM requirement that no debris greater than 2 feet in any dimension be disposed at the open-water sites is found in the PSDDA Management Plan Report (MPR) (PSDDA, 1989) in a section describing how suitable material should be evaluated to determine if debris is present:

> *"If the (dredge) site assessment indicates the presence of log debris or other debris hazards, the contractor's dredging plan shall include methods of separating debris before open-water disposal. Screening may be accomplished by a clamshell dredge operator retrieving debris from the barge hopper. If this cannot be done effectively, the contractor shall propose other methods, such as passing material through a steel grid (e.g., 24" x 24" mesh)."*

Prior to dredging, as stipulated in the 404 permit from the Corps of Engineers (COE), dredgers must submit a Dredging and Disposal Quality Control Plan (QCP). This plan must include the procedures that will be followed for removal of floatable and non-floatable debris. If there is reason to believe that more than *de minimis* debris has been disposed at an open-water site, DNR may require the dredger to conduct post-disposal monitoring at the disposal site.

Methods for Separating Debris from Dredged Material

The requirement to screen debris from dredged material has long been a component of COE contracts and use of a steel mesh or "grizzly" is a common technology employed in other parts of the United States. For example, the COE's 2001 Technical Note entitled, "Determining Recovery Potential of Dredged Material for Beneficial Reuse – Debris and Trash Removal" (ERDC, 2001) states:

> "From an economic and operations standpoint, it is advantageous to divert unwanted materials from the process stream at the earliest point. Currently, the Corps of Engineers requires that the dredging contractor be familiar with the channel and include debris and trash removal in the original dredging bid. This includes the price of handling debris and trash and the diversion of those waste streams before entering the CDF [confined disposal facility]. This is usually a matter of the contractor identifying areas with interfering debris and/or trash and using a clamshell dredge or log hooks and grapples to capture the bulk of the debris. Collected debris is often separated from sediment using a barge-mounted grizzly and deposited on a separate barge for proper disposal prior to the dredging phase."

Likewise, the Debris Management (13.4) and Wood Waste (8.4.3) sections of the DMMP User Manual also make reference to using a mesh to screen debris prior to disposal (DMMP, 2014). Grizzlies can be permanently affixed to a dredge scow or may be removable. They typically cover part of the scow and their design can vary from a flexible heavy-duty chain mesh to an inflexible steel mesh, examples of which are shown in Exhibit 1. The debris items captured on the grizzly may be individually transferred to a storage area on land or on the dredge derrick, or the entire grizzly may be cleared onto a separate debris barge (Exhibit 2).

Barge-mounted screens are rarely used in Washington State dredging projects to meet the debris removal requirement. Instead, debris removal is typically triggered based on visual observation of the dredge bucket (e.g., bucket will not close) and/or large debris on the surface of the sediment barge (Exhibit 3). Debris is removed from the sediment barge using the clamshell bucket and placed in a separate debris barge or containment area for later disposal at an upland facility. Since 1993, there have been only two dredging projects (Port of Seattle – T30, 1994; Port of Everett – Pacific Terminal, 2012) in which a grizzly or screening apparatus was used.

Problem statement:

Large Debris Observed at Disposal Sites:

Despite the DMMP's debris-management policies, debris exceeding the 2-ft dimension limitation has been observed during disposal site monitoring. Examples of this can be seen in photos from a 2014 remotely-operated vehicle (ROV) survey of the Elliott Bay site (Exhibit 4). Thus, while the visual observation approach may be effective to detect debris in projects with exceptionally large items (and small dredge buckets), it does not appear to be rigorous enough to prevent all large debris from going to the disposal sites.

Anthropogenic Debris Observed at Disposal Sites:

Anthropogenic debris has been observed during site monitoring (ROV surveys and trawling) at both the Elliott Bay and Anderson-Ketron sites. While screening may remove much of this material, the DMMP agencies are concerned that even a 2-foot grid could still allow small tires and other anthropogenic debris to pass. Unintended disposal of anthropogenic debris (e.g. tires) also has the potential to adversely affect disposal site sediments through the slow leaching of chemicals.

Presence of Large Debris May Change Habitat Quality at Open Water Sites:

Disposal of large debris may fundamentally alter the nature of disposal sites, potentially attracting certain species (e.g. rockfish, crab) to areas that were chosen for disposal in large part because of their relatively low use by biota. Debris can also interfere with the DMMP's monitoring of sites by impeding sediment profile imaging (SPI) cameras and trawl survey equipment.

User Manual doesn't explicitly define anthropogenic debris:

The original definition of debris in the UM focuses on larger debris of both natural and anthropogenic origin (e.g., concrete, wood, rip-rap). However, there is no discussion of other types of anthropogenic debris (rebar, tires, plastic trash) which can also be found in dredged material. The lack of specificity in the UM debris definition may cause confusion on what debris is allowable for disposal at open-water sites and what debris is not.

Disposal of Anthropogenic Debris May Erode Public Acceptance of Disposal Sites:

Continued use of multiuser open-water disposal sites is largely dependent on public acceptance. Public acceptance is based on trust in the regulatory agencies. This trust can be easily eroded if reasonable and prudent precautions are not built into the management guidelines for open-water disposal. Unintended disposal of anthropogenic debris at sites is one such factor that can erode public acceptance of sites.

Inconsistent Debris Screening Requirements between West Coast EPA Regions:

DMMP's requirements for and enforcement of debris removal are inconsistent with the more rigorous approach required of dredgers in EPA Region IX. In California, debris screening using a grizzly is a standard operating procedure for all dredging projects unless it can be demonstrated that there is a low likelihood of debris in the sediments to be dredged. (Brian Ross, personal communication, January 7, 2015). The San Francisco District of the USACE includes the following as standard language in their 404 permitting for dredging projects:

> "Mechanically dredged sediment will be passed through a debris grid, with a maximum opening size of 12 inches by 12 inches that will cover the entire loading area of the dump scow. Everything that does not pass through the grid will be considered solid debris and shall be disposed in areas outside of Corps jurisdiction. All such material shall be promptly removed from the grid at the end of each 8 hour shift or sooner" (Rob Lawrence, personal communication, January 7, 2015).

These debris screening requirements and techniques have been successfully implemented in California. Their implementation in Washington State would reduce the quantity and types of debris inadvertently disposed at open-water sites.

Proposed Clarification

All projects must use a screen to remove debris unless they meet exemption criteria:

The fact that anthropogenic and large debris have been observed at two non-dispersive sites (Anderson-Ketron and Elliott Bay) is indicative of the inefficacy of the visual sorting approach now in use. Therefore, dredging projects will be required to screen sediments through a grizzly (or equivalent device) prior to open-water disposal at either non-dispersive or dispersive sites, unless the proponent can demonstrate that debris is unlikely to be present by meeting one or more of the following criteria:

- Dredging of most native sediments.
- Dredging of frequently maintained navigation channels which are away from berths and shorelines (or that have been demonstrated to be debris-free in past dredging).
- Dredging in non-urban areas removed from marina/industrial/shipping activities (unless there is evidence of woody debris or rocks that might be dredged).
- Evidence from previous rounds of dredging (at the same location) demonstrating that no debris was encountered while using a screen.

The DMMP agencies acknowledge that in certain other circumstances there could be a reason-to-believe that debris is not present. However, it is the responsibility of the applicant to provide adequate information to the DMMP to support the determination for an exemption. The determination of whether or not a given project needs to use a grizzly will be documented in the DMMP Suitability Determination Memorandum.

Modification to Allowable Size of Debris that can be Disposed at Open-Water Sites:

The maximum size of woody debris or rip-rap that may be taken to the open-water disposal sites will now be one foot in any dimension. The rationale for reducing the maximum allowable dimension from two feet to one foot is to provide more effective removal of both

anthropogenic debris (e.g. tires) and woody/rock debris. Furthermore, doing so would align DMMP debris management guidelines with those in place in EPA Region IX.

To meet this requirement, material must be passed through a 1'x1' grid. Details regarding the type of grizzly to be used, how it is attached to the disposal barge, and means for clearing the screen must be proposed by the contractor as part of the QCP.

Implementation

Implementation of the requirement for physical screening of debris would begin on June 16, 2016, which is the beginning of dredging year 2017, to allow time for dredging proponents to adjust their contracting procedures and for dredgers to acquire or construct the necessary equipment.

The costs associated with the requirement to separate and dispose of anthropogenic debris may be changed by this clarification. Use of a 1'x1' grizzly will result in a higher retention of debris. The following elements of screening for debris have been described by contractors as having possible cost implications:

1. Mobilization of an additional flat scow and offloading equipment for debris
2. Offloading & disposal of debris
3. Cleaning and repairing the grizzlies
4. Moving the grizzlies
5. Potential reductions in production rate
6. Depending on cycle time, may necessitate an additional boat and dump barge in order to keep working

The DMMP anticipates a relatively smooth transition to implementation of the 1'x1' mesh requirement since many of the dredging companies working in Washington State have been successfully using 1'x1' grizzlies for dredging projects in California. While use of a grizzly at a site with significant amounts of debris may slow the dredge production rate, it is already a requirement to remove that debris and use of a 1'x1' grid will ensure its effective removal. Screening of dredged material at more typical sites, without large quantities of debris, is not expected to affect production rates based on over a decade of implementing this technology in California. (Brian Ross, personal communication, January 7, 2015).

Compliance with the requirement to use a 1'x1' grid for debris removal will be enforced through site inspections. Failure to use a grid when required may result in fines being levied by DNR, EPA and COE. Post-disposal monitoring may still be required at the disposal site, on a case-by-case basis, to verify the absence of problem debris if there is a reason to believe that a

dredger did not use a grid for those projects or portions of projects where use of a grid was required. The cost of site monitoring would be borne by the dredging contractor.

References

DMMP, 2014. Dredged Material Evaluation and Disposal Procedures – User Manual; prepared by the Corps of Engineers for the Dredged Material Management Program, December 2014.

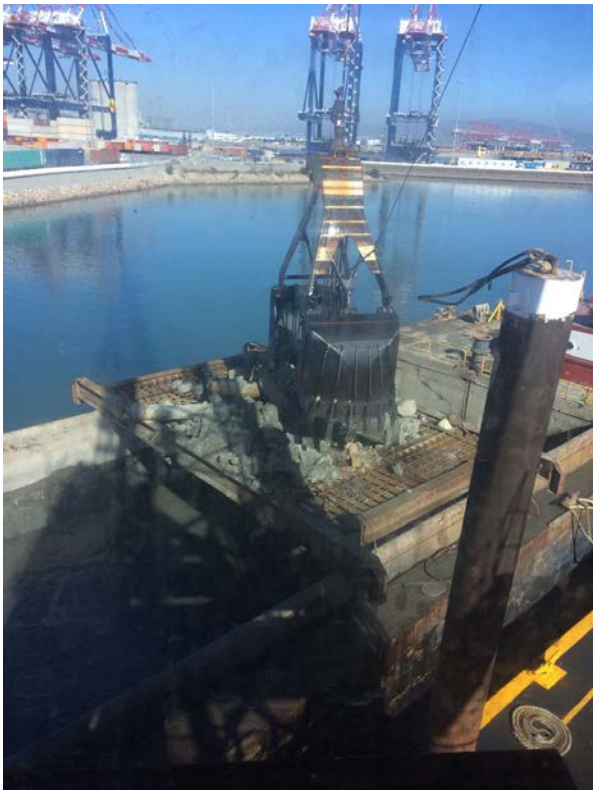
ERDC, 2001. Determining recovery Potential of Dredged Material for Beneficial Reuse – Debris and Trash Removal. TN-DOER-C24, December 2001.

PSDDA, 1988. Evaluation Procedures Technical Appendix – Phase I (Central Puget Sound).

PSDDA, 1989. Management Plan Report: Unconfined Open-Water Disposal of Dredged Material – Phase II (North and South Puget Sound).

DNR. Site Use Authorization (SUA) http://www.dnr.wa.gov/BusinessPermits/Topics/AquaticResources/Pages/aqr_dredged_material_program.aspx

Exhibit 1: Examples of Grizzlies



Steel grizzly - Port of Long Beach

Dredging into a barge with debris screen – Port of Long Beach (CA)

Large scow with movable steel grizzly – Port of Oakland (CA)

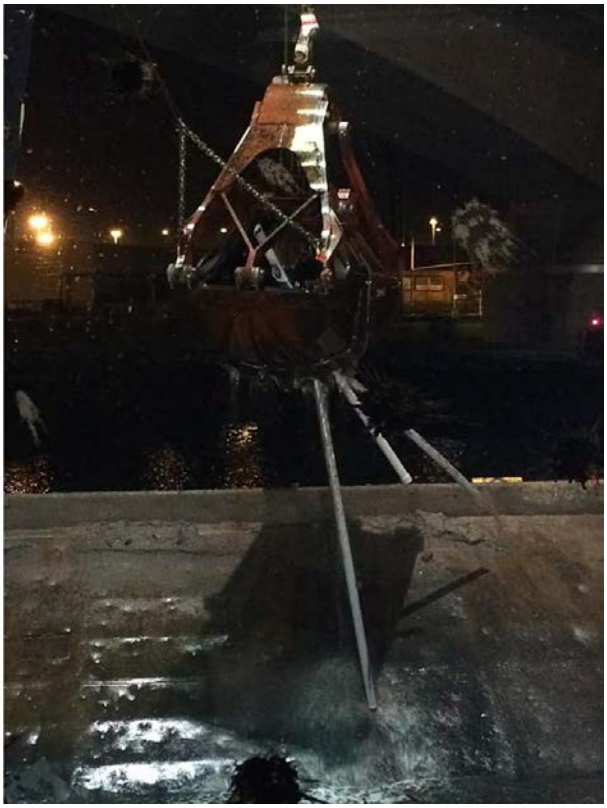
Chain grizzly (California)

Small bottom-door scow with fixed grizzly - San Francisco Bay (CA)

Exhibit 2: Debris captured on 1-ft square grizzlies (California)

Exhibit 3: Debris in unscreened dredged sediments (WA)

Miscellaneous dredge debris in dump scow; Note: 20-30” diameter tire, PVC pipe, steel cable and woody debris (Lower Duwamish Waterway)



PVC pipe debris in clam shell bucket (Lower Duwamish Waterway)

Exhibit 4: Photos illustrating debris at the Elliott Bay disposal site (2014)

Concrete

20- 30” tire

PVC pipe with crab