

DMMP CLARIFICATION PAPER

CLARIFICATIONS TO THE DMMP Z-SAMPLE ANALYSIS GUIDANCE AND/OR POST DREDGE MONITORING POLICY

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INTRODUCTION

During sediment characterization, the Dredged Material Management Program (DMMP) requires the collection and archiving of a sample (Z-sample) of the top one-foot of material extending beyond the proposed project dredging depth. This sample reflects the new surface sediment quality that would be exposed following dredging (EPTA, 1988, page I-14; Phase I MPR, 1988, page A-12; and Phase II MPR, page 5-34; Grays Harbor and Willapa Bay Dredged Material Users Manual, pages 57-58¹).

In practice, over the past twelve years of implementation, z-samples were only required for projects in high ranked areas, or in dredging areas where there was a concern for groundwater contamination. The initial guidance stipulated a tiered testing process, whereby archived Z-samples would only be analyzed if there was a “reason-to-believe” that the underlying sediments reflecting the new surface following dredging might be contaminated (e.g., if the immediately overlying sediments were unsuitable for aquatic disposal). During the early years of the Puget Sound Dredged Disposal Analysis (PSDDA) program implementation, most dredging projects were generally initiated in areas with better sediment quality, whereas during the last five years more dredging projects are being initiated in or adjacent to CERCLA or MTCA cleanup areas.

PROBLEM IDENTIFICATION

Recent characterization activities in the Blair Waterway (Pierce County Terminal Expansion Project) and East Waterway (Corps/Port of Seattle project; near the mouth of the Duwamish Waterway) have highlighted the need to clarify the rationale for the collection and analysis of z-samples for projects in areas with complex surface and subsurface chemical contamination.

Proposed dredging in the Blair Waterway, a low ranked project, found unexpectedly high levels of subsurface contamination (PCB's and DDT). In the Corps/Port of Seattle construction project in the East Waterway (Stages I and II), subsurface contamination generally was lower than existing surface contamination, but still showed chemical contamination which exceeded the SQS and in some cases the Cleanup Screening Level (CSL).

¹ Z-sample collection and analysis requirements are being added to the PSDDA Users Manual and will be posted prior to the 2001 SMARM.

A portion of the East Waterway project (Stage I) was dredged in 2000. Z-samples were collected but not analyzed as part of the initial Stage I East Waterway dredging project characterization. Because no Z-samples were analyzed, the predredge sediment quality of the Z-sample layer (new surface) was not known prior to dredging. Subsequent monitoring conducted by the Port of Seattle to assess postdredge sediment quality showed that the newly exposed surface was contaminated (exceeding the chemistry and/or bioassay interpretation CSL) in many areas. Further characterization of these areas will be required to clarify whether contamination is due to recontamination of the surface from the dredging operation, an extension of the contaminated sediment layer below the characterized sediments, or a combination of the two.

Lastly, sediments characterized from the Stage II East Waterway proposed dredging area but not yet dredged, also showed a similar pattern of increasing surface to subsurface contamination at some locations. At one location the Z-sample was analyzed and showed a Hg concentration exceeding the surface concentration (Figure 1). Thus, complex surface and subsurface sediment contamination issues identified from this project and others briefly described above have highlighted the need to clarify Z-sample collection and analysis requirements of the DMMP.

The clarification below will ensure that the DMMP agencies, especially Ecology, will be able to evaluate the postdredge sediment surface for compliance with Washington State's "anti-degradation" policy².

PROPOSED CLARIFICATION

The DMMP agencies propose the following clarification to the Z-sample collection and analysis guidance.

1. Z-samples will be collected and archived for every core sampling location for all projects in areas ranked from low to high, unless there is recent sediment quality data (e.g., within recency guideline specifications) to verify that contaminants are restricted to the surficial sediment layer (< 4 feet, or less than the depth cut plus overdredge proposed for dredging) of the sediments proposed for dredging.
2. If a surface dredged material management unit (DMMU) is found to be contaminated (e.g., unsuitable for unconfined-open-water disposal), and the underlying DMMU either is contaminated also or has not been adequately characterized, then archived Z-samples must be analyzed to verify the sediment quality of the Z-horizon.

² The new postdredge sediment surface can not be more contaminated than the existing predredge surface.

3. Z-sample analyses will initially consist of sediment conventional and chemical analyses. If the results of these analyses indicate exceedances of SMS-SQS or CSL chemicals of concern within the Z-sample horizon, the dredging applicant may be required to remobilize and resample those given Z-sample locations in order to perform required biological testing (bioassays and/or bioaccumulation testing). The evaluation standard for interpreting the Z-sample sediment quality data will be the Sediment Management Standards "Sediment Quality Standard".
4. The postdredged sediment surface (top 10 cm) may be subject to sediment quality evaluation at the discretion of the DMMP and/or SMS programs for any project where either overlying surface or subsurface DMMU's were found to be unsuitable for unconfined open-water disposal.

REFERENCES

EPTA, 1988. Evaluation Procedures Technical Appendix. Prepared by the Corps of Engineers in cooperation with the Environmental Protection Agency, Region 10, and the Washington State Departments of Ecology and Natural Resources.

GHWBUM³, 1995. Dredged Material Evaluation Procedures and Disposal Site Management Manual: Grays Harbor and Willapa Bay, Washington. Prepared by the Corps of Engineers in cooperation with the Environmental Protection Agency, Region 10, and the Washington State Departments of Ecology and Natural Resources.

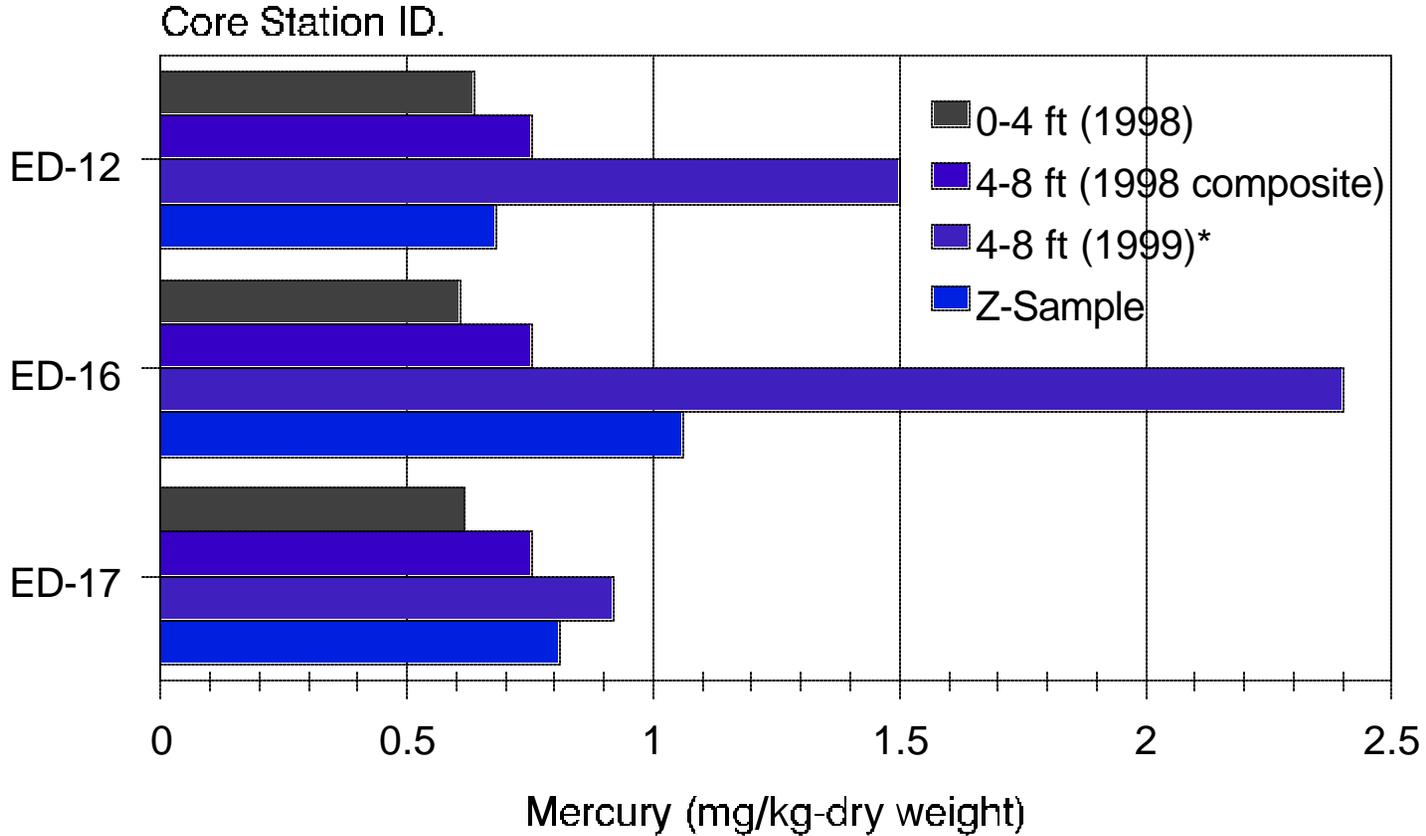
MPR, 1988. Puget Sound Dredged Disposal Analysis (PSDDA) Management Plan Report, Unconfined Open-Water Disposal of Dredged Material, Phase I (Central Puget Sound). Prepared by the Corps of Engineers in cooperation with the Environmental Protection Agency, Region 10, and the Washington State Departments of Ecology and Natural Resources.

MPR, 1989. Puget Sound Dredged Disposal Analysis (PSDDA) Management Plan Report, Unconfined Open-Water Disposal of Dredged Material, Phase II (North and South Puget Sound). Prepared by the Corps of Engineers in cooperation with the Environmental Protection Agency, Region 10, and the Washington State Departments of Ecology and Natural Resources.

³ GHWBUM = Grays Harbor, Willapa Bay Dredged Material Users Manual.

Figure 1. East Waterway Project (Stage II)

Surface/Subsurface Mercury Comparisons



*1998 Subsurface composited D7 resampled in 1999 and reanalyzed as individual uncomposited samples.