

DMMP Clarification Paper

Sediments Exposed by Dredging (Z-layer) Testing

Prepared by Laura Inouye (Ecology) and the DMMP Agencies

Introduction

The DMMP agencies require that the sediment to be exposed by dredging (SED) be sampled to a depth of 1 ft below overdepth for all projects, regardless of rank, and archived pending the testing results for the overlying sediment. Chemical analysis of this archived material is required if the testing results for the overlying sediment are a) found to be unsuitable for unconfined aquatic disposal, or b) if any other project in the same water body has shown evidence of subsurface sediments with greater contamination than surface sediments, or c) if there is any other site-specific reason to believe that the SED may fail to meet the antidegradation policy. Although the DMMP has clarified when Z-sample analyses are required (DMMP 2001) and how the data will be interpreted (DMMP 2008), there have been no revisions since 2001 regarding how samples are collected, composited, and archived.

Problem Identification

Traditional analysis of the SED has relied on a one-foot section below the overdepth of a project. However, dredge projects do not leave a flat surface exactly at the lower boundary of the allowable overdepth. Dredging precision is affected by a variety of factors (ERDC, 2007) and the actual post-dredge surface may be slightly below the authorized overdepth. Recent discussions with applicants and with the Regional Sediment Evaluation Team have emphasized that traditional one-foot below dredge prism evaluations may not represent what is likely being exposed. In addition, the dredging process can be expected to disturb sediment well below the newly exposed surface (ERDC, 2007). For example, toothed buckets penetrate beyond the final exposed surface when loading, thereby mixing deeper and shallower sediment in the process.

Compositing of Z-samples has traditionally not been allowed. This makes sense when benthic toxicity is the driver, as typical benthic invertebrates (other than crabs) have a small home range and stay in a restricted area. However, this makes less sense when bioaccumulatives are being evaluated since the organisms being impacted are quite mobile (crab and fish). Thus, in cases where bioaccumulatives are the driver for Z-sample analysis, an average across the DMMU is more representative of the potential exposure.

Proposed Clarification

The DMMP proposes that Z-layer analyses should be representative of a two-foot section, starting at the lower boundary of the authorized overdepth and going two feet below the authorized overdepth. In cases where the applicant may wish to get more finely tuned characterization of the depth profile for a contaminant, one-foot increments may be archived and analyzed (to whatever depth the applicant may

find useful) in addition to the 2-foot Z-layer. If applicants do not intend to dredge into the authorized overdepth, then the Z-layer should begin at the final depth expected for the project.

Compositing of Z-samples for a project will be based on the contaminants of concern. If the issue is chemical analysis to screen against the SQS for benthic toxicity, no compositing would be allowed. If the concern is bioaccumulatives, compositing of Z-samples within each DMMU may be allowed based on a number of considerations including project specifics and location. Compositing will only be allowed in coordination with DMMP. Since compositing may or may not be allowed depending on the nature of the chemicals of concern, all Z-samples should be archived individually.

REFERENCES

DMMP, 2001. CLARIFICATION TO THE DMMP Z-SAMPLE ANALYSIS GUIDANCE AND/OR POST DREDGE MONITORING POLICY.

DMMP, 2008. QUALITY OF POST-DREDGE SEDIMENT SURFACES (UPDATED)

ERDC, 2007. OVERDEPTH DREDGING AND CHARACTERIZATION DEPTH RECOMMENDATIONS.