

Adoption of Elements of the Sediment Evaluation Framework for the Pacific Northwest for Use in the Dredged Material Management Program

Prepared by David Fox (U.S. Army Corps of Engineers) for the DMMP agencies.

Introduction

One purpose of the Regional Sediment Evaluation Team's (RSET) Sediment Evaluation Framework (SEF) is to "make sediment evaluation procedures as consistent as possible throughout the Pacific Northwest" (RSET, 2016). To help maintain a regionally consistent framework, the Dredged Material Management Program (DMMP) agencies are committed to adopting SEF guidance where possible and relevant. The recent update of the SEF provides an opportunity to align the guidance provided in the DMMP User Manual (UM) with the guidance provided in the revised SEF as appropriate. It also allows the DMMP to benefit from advances made in sediment science and management in other parts of the Pacific Northwest.

Problem Identification

Upon finalization of the revised SEF, Seattle District compared the SEF and UM and found a number of differences between the two. These differences are identified in Attachment 1. Some differences are due to the historical underpinnings of the two programs. For example, the volume limits used by the DMMP agencies for dredged material management units (DMMUs) were established during the Puget Sound Dredged Disposal Analysis (PSDDA) study (PSDDA, 1988) for projects in Puget Sound. The RSET agencies, in developing sediment characterization guidelines for the Columbia River, established somewhat larger volume limits due to the high sand content typically found and the large volume of dredging required annually to maintain the federal navigation channel. Where such a rationale exists for a difference between the SEF and the UM, there is no need for alignment.

In other cases, such as implementation of the revised freshwater benthic evaluation guidelines, alignment of the SEF and UM is essential to ensure that the best available science is being used in both programs. The DMMP agencies adopted the revised freshwater benthic guidelines as part of the 2015 Sediment Management Annual Review Meeting (SMARM) public review process. The new freshwater benthic guidelines are now included in both the UM and revised SEF.

The following sections identify those elements of the dredged material evaluation guidelines from the revised SEF that the DMMP agencies propose adopting. The rationale for doing so is also provided. There are a number of other elements that the DMMP agencies do *not* propose adopting. These elements, and the rationale for their non-adoption, are listed in Section B of Attachment 1.

SEF Guidelines Proposed For Adoption

1. **'Very Low' Rank**

(Attachment 1: Items A1, A2, and A3)

The Clean Water Act (CWA) Section 404(b)(1) Guidelines promulgated by EPA include the following provisions for no-test determinations: "...[if] the dredged or fill material is not a carrier of contaminants,

then the required determinations pertaining to the presence and effects of contaminants can be made without testing. Dredged or fill material is most likely to be free from chemical, biological, or other pollutants where it is composed primarily of sand, gravel, or other naturally occurring inert material. Dredged material so composed is generally found in areas of high current or wave energy such as streams with large bed loads or coastal areas with shifting bars and channels.”

Exclusion from testing under these guidelines has been addressed in various forms over the years in the SEF and UM. The revised SEF includes a ‘very low’ Management Area Rank (MAR) to implement the no-test provision. The two lines of evidence that can be used to establish a rank of ‘very low’ for a project are as follows:

“Based on the site history information review, the site is sufficiently removed from potential sources of sediment contamination and there are no known or suspected contaminated sites within the watershed. Bioaccumulative compounds are not likely present at levels of concern based on review of historical data and comparison to region-specific bioaccumulation triggers.”

“Sites with strong current and/or tidal energy typically consist of coarse-grained sediment with at least 80 percent sand retained in a No. 230 sieve and total organic carbon (TOC) content of less than 0.5 percent. Typical locations include gravel bars, main-stem channels such as the lower Columbia River, and coastal inlets subject to the ebb and flood of tide.”

The following additional guidance is also provided in SEF:

“These values [specified in the second line of evidence above] are guidelines and the local review team may use discretion in their application. Photographic evidence of grain size (e.g., a photo of a gravel bar obstructing navigation) may be sufficient to rank a project “very low” without having the proponent analyze for TOC, because low TOC is presumed. Project sediments may also fall within the appropriate grain size and TOC range, but be located in close proximity to sources of contamination (making the project ineligible for a “very low” management area rank).”

In contrast to the no-test guidelines included in the SEF, the DMMP UM includes a section called: “Testing Exclusions Based on Tier 1 Analysis.” The testing exclusions in the UM cite the CWA Section 404(b)(1) Guidelines and the Inland Testing Manual (EPA/USACE, 1998) as follows:

“Exclusions can be made if a Tier 1 evaluation indicates that the dredged material is not considered to be a “carrier of contaminants” (40 CFR 230.60 (b)). Potential exclusion situations occur most commonly “if the dredged material is composed primarily of sand, gravel and/or inert materials; the sediments are from locations far removed from sources of contaminants, or if the sediments are from depths deposited in preindustrial times and have not been exposed to modern sources of pollution” (ITM 1998). Testing may also not be necessary “where the discharge site is adjacent to the excavation site and subject to the same sources of contaminants, and materials at the two sites are substantially similar” (40 CFR 230.60(c)). All testing exclusions are project-specific and may be subject to other regulatory authorities and guidelines.”

The two sets of guidelines are similar, but not identical. For example, the SEF includes numerical guidelines for determining what qualifies from a physical standpoint as ‘very low’ ranked material. The DMMU UM does not include any numerical guidelines.

Proposal: The DMMP agencies propose adopting the ‘very low’ rank and applying it to eligible projects anywhere in Washington State. The SEF lines of evidence associated with the ‘very low’ rank are proposed for adoption in the UM – with minor changes – as follows:

“Based on the site history information review (Tier 1), the dredged material is sufficiently removed from potential sources of sediment contamination either geospatially or vertically (in the case of native sediment). Bioaccumulative compounds are not likely present at levels of concern based on review of historical data and comparison to the DMMP bioaccumulation triggers.”

AND

“The site is subject to strong current and/or tidal energy and contains coarse-grained sediment with at least 80 percent sand retained in a No. 230 sieve and total organic carbon (TOC) content of less than 0.5 percent. Typical locations include sand and gravel bars, the main-stem channel of the lower Columbia River, the outer reaches of the Grays Harbor navigation channel, and marina entrance channels subject to deposition of coarse-grained sediment from longshore drift. Grain size and/or TOC analysis may be necessary in some cases to demonstrate that the dredged material meets the numerical guidelines. In other cases, photographic evidence of grain size (e.g., a photo of a gravel or sand bar obstructing navigation) may be sufficient to rank a project “very low” without having the proponent analyze for grain size or TOC.”

AND

“All testing exclusions are project-specific and may be subject to other regulatory authorities and guidelines.”

The 10-year recency guideline will be used for cases where testing of grain size and/or TOC is required periodically to confirm the ‘very low’ rank.

The second no-test situation currently in the UM will be retained, but the ‘very low’ rank will not be applied in such cases:

“Testing may also not be necessary where the discharge site is adjacent to the excavation site and subject to the same sources of contaminants, and materials at the two sites are substantially similar (40 CFR 230.60(c)).”

2. DMMU Volumes for Projects on the Columbia River

(Attachment 1: Item A4)

As discussed in the problem identification section of this paper, the volume limits used by the DMMP agencies for DMMUs were originally established for the PSDDA program. The volume limits found in the SEF were developed by the RSET agencies for the lower Columbia River, where rapid shoaling and sediment with a high sand content are common. The revised SEF acknowledges this difference and states that the DMMP UM should be consulted for projects in the state of Washington. Where the problem lies is for projects on the Washington State side of the lower Columbia River itself. Portland District has regulatory responsibility for port projects on the Washington State side and uses the DMMU volume limits found in the SEF for these projects. Seattle District has regulatory responsibility for the non-port projects on the Washington State side and has historically used the DMMU volume limits found in the DMMP UM.

Since the SEF volume limits for DMMUs were developed with projects on the lower Columbia River in mind, the DMMP agencies agree that **all** projects on the lower Columbia – regardless of whether they are port projects or non-port projects – should be treated in a consistent manner.

Proposal: Apply the SEF DMMU volume limits to non-port projects on the lower Columbia River and update the UM to reflect this change.

3. Field sampling checklist

(Attachment 1: Item A5)

The revised SEF includes a field sampling checklist, which may be a useful guide for sampling contractors. The DMMP UM does not have such a checklist.

Proposal: Include the field sampling checklist from SEF in the DMMP UM.

4. Tissue analysis

(Attachment 1: Item A6)

The revised SEF includes a table (Table 8-2) with recommended prep methods, analytical methods, and sample quantitation limits for tissue analysis. The DMMP UM does not have such a table and would benefit from its inclusion.

Proposal: Add a version of Table 8-2 from the revised SEF to the DMMP UM.

Proposed Action/Modification

The DMMP agencies propose adopting certain elements from the revised SEF for inclusion in the DMMP UM. The elements proposed for adoption are discussed in the previous section of this paper.

Comments submitted in response to the proposed UM modifications will be considered by the DMMP agencies. Depending on the comments received, the agencies may adopt some or all of the proposed modifications without change; adopt some or all of the proposed modifications with edits to address public comments; and/or drop some or all of the proposed modifications.

References

DMMP, 2015. Dredged Material Evaluation and Disposal Procedures – User Manual. Prepared by the Seattle District Dredged Material Management Office for the DMMP Agencies, November 2015.

EPA/USACE, 1998. Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Inland Testing Manual. Prepared by EPA and USACE, February 1998.

Federal Water Pollution Control Act (the “Clean Water Act”). 33 U.S.C. §§ 1251-1387 (1972).

RSET, 2016. Sediment Evaluation Framework for the Pacific Northwest. Prepared by the Regional Sediment Evaluation Team, April 2016.

Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material. CFR Title 40 Part 230 (1979).

Attachment 1

Differences between the 2016 SEF and 2015 DMMP User Manual

A. The following differences are addressed by the 2016 SMARM Clarification Paper, entitled “Adoption of Elements of the Sediment Evaluation Framework for the Pacific Northwest for Use in the Dredged Material Management Program.”

A1. Ranking:

- SEF includes ‘very low’ rank
- DMMP includes ‘Tier 1 Exclusionary’ rank, which is equivalent to ‘very low’ rank in SEF
- DMMP acknowledges ‘very low’ rank from SEF for projects on the Columbia

Proposal: Add ‘very low’ rank to UM for use throughout the State of Washington, using a modification of the definition found in SEF

A2. Recency guidelines:

- SEF includes recency period of 10 years for ‘very low’ rank
- DMMP has no equivalent recency period

Proposal: Add 10-year recency period for ‘very low’ rank to UM

A3. Very low/exclusionary guidelines:

- SEF specifies $> 80\%$ sand and $\leq 0.5\%$ TOC for ‘very low’ rank
- DMMP does not specify; uses narrative excerpts from CWA

Proposal: Add the sand and TOC specifications to the UM

A4. DMMU volume limits:

- The Portland Sediment Evaluation Team uses volumes from the SEF for port projects on the Washington side of the river
- DMMP uses volumes established by PSDDA for non-port projects on the Washington side of the river

Proposal: Adopt the SEF DMMU volume limits for non-port projects on the lower Columbia River.

A5. Field sampling checklist:

- SEF includes this checklist
- DMMP UM does not

Proposal: Add the checklist to the UM

A6. Bioaccumulation:

- SEF includes a table with prep method, analysis method and sample quantitation limits for tissue analysis
- DMMP UM has no such table

Proposal: Add SEF table to UM

B. The following differences are not proposed to be addressed at this time. They are either acknowledged in the revised SEF; are in the process of being updated in RSET; are not important enough to adopt in DMMP; or originated in the PSDDA documentation but were not adopted by RSET.

B1. Testing tiers/levels:

- SEF Level 1 = DMMP Tier 1
- SEF Level 2A = DMMP Tier 2
- SEF Level 2B = DMMP Tier 3
- SEF special evaluations are in Level 2B; DMMP special evaluations are in Tier 4

Rationale for no action: The DMMP's four tiers of testing originated in the PSDDA documents (Tier 4 was called the "Dredger's Option"); the Inland Testing Manual uses four tiers; this is simply a difference in nomenclature and has no real significance for dredged material evaluations.

B2. SEF includes use of conceptual site models; DMMP does not.

Rationale for no action: The DMMP agencies plan to explore the utility of conceptual site models for dredged material evaluation and management. If the CSMs prove to be useful, the DMMP agencies will propose adoption in the future.

B3. Testing guidelines for small projects:

- SEF has a short narrative section, including a statement that ESA considerations can trigger testing regardless of project size
- DMMP specifies small-project no-test volumes based on rank

Rationale for no action: The DMMP small-project guidelines were established as an element of the PSDDA program and provide a financial break to small-scale operations with limited financial resources. For high-ranked areas there is not a "no test" volume and some testing is always required. In addition, the resource agencies may require testing – even for small projects – in areas where dredging could potentially mobilize contaminants in areas important for threatened or endangered species.

B4. Down-ranking:

- DMMP allows down-ranking based on 'partial characterizations'
- DMMP has specific chemical concentration guidelines for down-ranking
- SEF doesn't include partial characterizations, nor does it provide specific chemical concentration ranges to be used for down-ranking

Rationale for no action: The guidelines for partial characterizations were established during the PSDDA study. They are infrequently used, but could still serve a purpose for some large projects.

B5. Overdepth:

- The Portland Sediment Evaluation Team uses paid/unpaid overdepth to determine limit of characterization
- DMMP uses total overdepth to determine limit of characterization

Rationale for no action: Dredging proponents typically do not know the paid/unpaid split in overdepth at the time of sediment characterization. The use of total overdepth has worked fine for DMMP.

B6. Total volatile solids:

- DMMP requires TVS testing for all DMMUs
- The Portland Sediment Evaluation Team only requires TVS analysis if there is reason to believe that wood waste is present

Rationale for no action: This testing is inexpensive. It is not always known when wood waste will be encountered so having the TVS data provides an additional indicator of its presence.

B7. Marine vs. freshwater:

- SEF uses 1 ppt salinity as upper limit for freshwater
- DMMP uses 0.5 ppt salinity as upper limit for freshwater
- SEF includes ‘estuarine’ as a category and leaves it up to the review team to use FW or marine guidelines
- DMMP UM states that everything over 0.5 ppt salinity is treated as marine

Rationale for no action: The difference is insignificant. Also, on the three rivers where this issue has come up (Duwamish, Snohomish and Columbia), DMMP uses established river miles to determine whether freshwater or marine testing is needed; salinity measurements are only used if a proponent proposes using freshwater guidelines and bioassays in the freshwater-to-marine transition portion of the Duwamish River.

B8. Special COCs:

- SEF still includes guaiacols
- Note: DMMP dropped guaiacols, but they are still mentioned in the header in Table 8-2 of the UM
- SEF states that organophosphate pesticides and potentially other types of pesticides may need to be considered
- DMMP includes wood waste while SEF does not

Rationale for no action: The DMMP agencies historically required guaiacol analysis from time to time in Grays Harbor and Puget Sound. However, because there were no evaluation guidelines for guaiacols, the testing served no real purpose. As for pesticides, the UM states that non-standard COCs may need to be tested based on site-specific conditions. The DMMP agencies have required such testing for non-standard pesticides in Willapa Bay.

B9. Sulfides sampling:

- The Portland Sediment Evaluation Team still uses one core section from each DMMU
- DMMP now takes sulfides sample from composited samples

Rationale for no action: The DMMP agencies addressed this issue in 2015 after years of evaluation.

B10. Bioaccumulation triggers:

- DMMP uses BTs that were originally established for the PSDDA program and have evolved over time
- The Portland Sediment Evaluation Team uses the screening level values (SLVs) published in ODEQ’s (2007) *Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment*
- SEF acknowledges that regional BTs have not been established due to technical and regulatory challenges and recommends that the local review team be consulted regarding BTs

Rationale for no action: There is currently no general agreement regarding the technical and regulatory basis for specific BTs.

B11. Bioaccumulation test interpretation:

- SEF and DMMP have different sets of target tissue levels

Rationale for no action: The DMMP agencies acknowledge that this is an issue that needs to be addressed.

B12. Elutriate testing:

- SEF includes a lot of information about elutriate testing, including elutriate test triggers
- The DMMP UM only addresses elutriate bioassay testing, but references the elutriate assessment procedures in SEF

Rationale for no action: RSET continues to work on water quality-based SLs, including elutriate testing. The DMMP agencies will monitor RSET progress and adopt new and improved guidelines as needed.