



Dredged Material Management Program New Interim Guidelines for Dioxins

December 6, 2010

OVERVIEW

The Dredged Material Management Program (DMMP) Agencies have completed a three-year process to develop guidelines for dioxin in dredged material that are consistent with Washington State's Sediment Quality Standards. These guidelines are intended for application when evaluating dredged materials proposed for disposal in unconfined, open-water sites in Puget Sound.

After an initial series of public meetings and extensive sampling throughout the main basin of Puget Sound, the DMMP agencies proposed updated guidelines at the Sediment Management Annual Review Meeting (SMARM) in 2009. Significant public comment was received on the proposed guidelines at the 2009 SMARM. In response, open technical workshops were held in May and June 2009, and additional input was received at those meetings from a full range of stakeholder interests.

The DMMP agencies deliberated on the input received at the SMARM 2009 and subsequent workshops, and revised the proposed guidelines based on that input. The revised guidelines were released for public review prior to the 2010 SMARM. Again, significant public comment was received following the 2010 SMARM. The DMMP agencies made minor modifications to the guidelines based on the input received. The DMMP agency directors approved the new interim guidelines on September 15, 2010 and established an implementation date of December 6, 2010.

The new interim guidelines represent a continuation of the DMMP's systematic approach to periodically updating sediment evaluation guidance. The new interim guidelines are meant to accomplish the following objectives:

- to reduce bioaccumulative risk to human and ecological receptors from dioxin;
- to insure that sediment dioxin concentrations at disposal sites reflect non-urban background in order to be consistent with the narrative human health requirements in the Washington State Sediment Management Standards;
- to incorporate recently-updated information on Puget Sound sediment dioxin background

The new interim guidelines are described below. Note that these guidelines remain "interim", as dioxin policies will continue to be refined in concert with the development of guidelines for other bioaccumulatives, especially dioxin-like PCBs.

UPDATED DIOXIN TESTING REQUIREMENTS

Testing for dioxins will continue to be required on a case-by-case basis in areas where there is reason to suspect presence of these chemicals. Factors which can trigger a “reason-to-believe” determination include the following:

- Location within an urban bay and having no historical information showing that dioxin is below interim guidelines.
- Proximity to current or historical point sources, such as outfalls
- Proximity to chlor-oxide bleach process pulp mills, chlor-alkali or chlorinated solvent manufacturing plants, former wood treatment sites, phenoxy herbicide manufacture and/or use and handling areas
- Proximity to areas with high polychlorinated biphenyl (PCB) concentrations
- Proximity to former hog fuel burners/boilers and areas with previous fires or incineration sources
- Proximity to areas previously sampled that showed elevated levels of dioxin

Dioxin testing will be required for all projects meeting one or more of the reason-to-believe factors described above. Deeper underlying sediments, which are confirmed as “native,” may be exempt from testing. Native material within the dredge prism, and lying directly under sediment that is being tested for dioxins, should be archived for possible dioxin analysis.

These updated guidelines are consistent with the reason-to-believe requirements implemented in the last several years. Guidance for sampling density per project will remain unchanged.

In addition, in order to address uncertainties regarding the fate of sediments disposed at dispersive sites, the DMMP agencies may require dioxin testing for projects proposing disposal at dispersive sites. Specifically, for those projects for which dioxin testing would not normally be required under the reason-to-believe guidelines, the DMMP agencies may require dioxin analysis of a reduced number of sediment samples. The decision to conduct this testing will be based on the size of the project and the grain-size characteristics of the dredged material. DMMP agencies are planning to conduct a fate and transport study for disposal operations at the Port Townsend and Rosario Strait disposal sites. Depending on the outcome of this study, the expanded dioxin testing requirement may be retained or dropped.

UPDATED DIOXIN GUIDANCE FOR *DISPERSIVE DISPOSAL SITES* IN PUGET SOUND

For dispersive disposal sites, the revised guidelines include definitions of both a Dispersive Disposal Site Management Objective and a Dispersive Dredged Material Suitability Guideline.

Dispersive Site Management Objective: 4 pptr (parts per trillion, dry-weight) 2,3,7,8-tetrachloro-*p*-dibenzodioxin toxicity-equivalents (TEQ) will be defined as the Site Management Objective for all dispersive disposal sites in Puget Sound. This value is based on an upper bound estimate of the distribution of dioxin in sediments from non-urban areas of Puget Sound ¹.

¹ Specifically, 4 pptr is the nonparametric estimation of the 90% upper confidence limit for the 90th percentile of the distribution of the background Puget Sound Main Basin data set, rounded up to the nearest whole digit.

Dispersive Dredged Material Suitability Guideline: The Dredged Material Suitability Guideline is the maximum dioxin concentration allowed in any single Dredged Material Management Unit (DMMU). For dispersive sites, this guideline is set equal to the Dispersive Site Management Objective of 4 ppt TEQ. Other dioxin concentrations can be approved on a case-by-case basis, if demonstrated to be consistent with the anti-degradation provisions in the Sediment Management Standards (SMS) rule².

This Dispersive Dredged Material Suitability Guideline is consistent with previous background-based requirements for dioxin at dispersive sites, but has been updated based on recently acquired data.

UPDATED DIOXIN GUIDANCE FOR NON-DISPERSIVE DISPOSAL SITES IN PUGET SOUND

For non-dispersive disposal sites, the revised guidelines include definitions of both a Non-dispersive Disposal Site Management Objective and Non-dispersive Dredged Material Suitability Guidelines.

Non-dispersive Disposal Site Management Objective: Four ppt TEQ will be the objective for surface sediments within the boundary of a disposal site, to be achieved over time as the updated suitability guidelines are implemented. This objective will aid in case-by-case decision-making (see next paragraph) on the suitability of material for disposal and assure protection of human and ecological health. This objective is also based on an upper bound estimate of the distribution of dioxin in sediments from non-urban areas of Puget Sound³. Disposal site monitoring will provide the feedback necessary to determine whether the site management objective is being met.

Non-dispersive Dredged Material Suitability Guidelines: Proposed revised suitability guidelines will be used in a case-by-case decision-making approach that is consistent with the narrative human health standard in the SMS rule. The following Non-dispersive Screening Levels represent sediment concentrations of dioxin which the agencies believe can be safely disposed at non-dispersive, open-water sites. A project-specific evaluation would be necessary to allow disposal of material with higher levels. It is anticipated that this evaluation process will produce information and experience that will support the future adoption of specific suitability criteria by rule. The suitability guidelines will have three components:

- (1) Nondispersive Screening Levels. DMMUs with dioxin concentrations below 10 ppt TEQ will be allowed for open-water disposal as long as the volume-weighted average concentration of dioxins in material from the entire dredging project does not exceed the Disposal Site Management Objective of 4 ppt TEQ.
- (2) Case-by-Case Determinations: As has been the case throughout the history of the DMMP program, case-by-case determinations may be made based on consideration of the individual aspects of dredging projects. Case-by-case decisions to allow disposal of material not meeting the screening levels may be made by the DMMP Agencies based on the overall goal of meeting the Non-dispersive Disposal Site Management Objective. Case-by-case considerations will include the following: (a) material placement sequencing;

² Case-by-case determinations will require the dredging proponent to submit a high level of supporting data on a regional scale to be reviewed by DMMP Agencies.

³ Specifically, 4 ppt is the nonparametric estimation of the 90% upper confidence limit for the 90th percentile of the distribution of the background Puget Sound Main Basin data set, rounded up to the nearest whole digit.

- (b) consideration of the possible cumulative effects of other bioaccumulative compounds within the project sediments; and (c) the frequency of disposal site use.
- (3) Small Business Considerations for Nondispersive Sites: Public or Private enterprises defined as "Small Businesses" by Chapter 19.85 RCW⁴, which are permit applicants for projects with total dredged volume less than 4,000 cubic yards, will be encouraged to submit applications for case-by-case consideration as long as all DMMU concentrations are less than 10 pptr TEQ dioxin. These projects *may* not be required to meet the volume-weighted average guideline if DMMP review determines that the Disposal Site Management Objective of 4 pptr will likely be met on an annual average basis, based on knowledge of other anticipated use of the identified disposal site. To clearly define what constitutes a project of less than 4,000 cubic yards, there are two key qualifiers. First, intentional partitioning of a dredging project to reduce or avoid testing requirements is not acceptable. Second, recognizing that multiple small discharges can cumulatively affect the disposal site, project volumes are defined in as large a context as possible. One example of this latter qualifier is recurring maintenance dredging of a small marina where "project volume" will be the projected dredging volume over 5 years. Another example is multiple-project dredging contracts where a single dredging contractor conducts dredging for several projects under a single contract or contract effort. Again, the "project volume" will be summed across all projects (as will any sampling and compositing efforts prior to testing).

BIOACCUMULATION TEST OPTION

When the sediment dioxin concentration in a dredging unit exceeds the 10 pptr TEQ screening level and the dredging unit is found unacceptable for non-dispersive disposal under case-by-case decision-making, the dredging proponent will have the option of pursuing bioaccumulation testing to determine whether or not individual DMMUs could qualify for open-water disposal. This option will be based on a modified version of the Tier III testing procedures included in the existing DMMP Users Manual.

A target tissue level (TTL) to be used in the bioaccumulation evaluation has not been determined for dioxins at this time. In the absence of a TTL, the dredging proponent who selects the option of bioaccumulation testing will be required to include exposure of test organisms to a suitable reference sediment as part of the bioaccumulation test. Concentrations in the project test-sediment tissue would be compared against concentrations in the reference-sediment tissue to determine the bioavailability of sediment dioxin and, thereby, the suitability of dredged material for open water disposal. Over time, a tissue database will be developed, which may allow for the adjustment of this protocol.

INCREASED MONITORING OF DISPOSAL SITES TO TRACK IMPACT OF UPDATED GUIDELINES

The effect of the updated dioxin interim guidelines on sediment quality at the non-dispersive open water disposal sites in Puget Sound will be monitored to provide information for adaptive programmatic management of the sites to meet Site Management Objectives.

⁴ In Chapter 19.85 RCW "Small business" means any business entity, including a sole proprietorship, corporation, partnership, or other legal entity, that is owned and operated independently from all other businesses, and that has fifty or fewer employees.

The agencies plan to increase the number of on-site sediment monitoring samples collected at each non-dispersive disposal site from 3 to 10 to allow statistical comparisons to be made with Main Basin/Reference Area dioxin concentrations. If the disposal site management objective for sediment of 4 ppt TEQ is not met, results of bioaccumulation testing of on-site sediments may be evaluated to determine whether overall site management objectives are being met. Otherwise, the site monitoring program will be very similar to the current program. The DMMP anticipates that monitoring frequency will be increased (if resources are available) to assist with the adaptive management of dioxins at the disposal sites.

DISCLAIMER

Although the underlying regulations referenced and described in this guidance document contain legally binding requirements, this guidance document does not substitute for those provisions or regulations, nor is it a regulation itself. In the event of a conflict between the discussion in this document and any statute or regulation, this document would not be controlling. Thus, it does not impose legally binding requirements on the DMMP agencies or the regulated community, and might not apply to a particular situation based upon the circumstances. The word "should" as used in the Guidance is intended solely to recommend or suggest, in contrast to "must" or "shall" which are used when restating regulatory requirements. While the guidance document indicates the DMMP agencies' anticipated approach to assure effective implementation of legal requirements, the preferential analytical framework is flexible, decisions made utilizing this framework are made on a project-specific basis through the application of best professional judgment, the framework encompasses alternative evaluation processes that may be applied at the election of the proponent, and DMMP agencies' decision-makers retain the discretion to adopt approaches on a case-by-case basis that differ from the guidance where appropriate. Any decisions regarding a particular project will be made based on the statute and regulations. Interested parties are free to raise questions and objections about the analytical approach reflected in the guidance and the appropriateness of the application of the guidance to a particular situation. The guidance is a living document and may be revised periodically through the SMARM process. The document will be revised, as necessary, to reflect any relevant future regulatory amendments. The DMMP agencies welcome public comments on the document at any time and will consider those comments in any future revision of the guidance document.