ISSUE PAPER

REFINEMENTS TO BIOACCUMULATION TESTING REQUIREMENTS: ADOPTION OF SECOND TEST SPECIES FOR CONSISTENCY WITH NATIONAL GUIDANCE

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INTRODUCTION

The PSDDA program requirements for bioaccumulation testing currently require a single 28-day test using the facultative deposit-feeding adult bivalve, *Macoma nasuta* to evaluate human and ecological health concerns [1]. The current guidance specifies how human health assessments will be done but does not provide specificity on how ecological health assessments will be conducted. The 1993 draft Inland (404) Testing Manual and 1991 "Green Book" (Ocean Dumping Guidance Manual) provide additional guidance on how bioaccumulation testing should be conducted on dredged material [2,3].

The current human health sediment guidelines used by the PSDDA program were developed for deep water disposal sites somewhat removed from natural resources and human resource conflict areas. Future human health sediment criteria being developed by Ecology and the Department of Health may significantly alter the chemicals of concern list, testing triggers and action levels used in regulating dredged material and contaminated sediments.

Development of these criteria are mandated as part of the State of Washington's Sediment Management Standards (SMS, WAC 173-204) [4]. The standards developed must consider the adverse impacts of contaminated sediments on the environment (aquatic, and other organisms) and on human beings. The criteria are being developed and are expected to be in draft form sometime during 1994 for review.

Subsequent to adoption by Ecology through the rule-making process, the new criteria will be implemented in Puget Sound. They may replace the current "reason to believe" sediment bioaccumulation triggers (BTs) and human health interpretive guidelines. The PSDDA program will continue to use the BTs and interpretive guidance specified in the Evaluation Procedures Technical Appendix and Phase II Management Plan Report.

PROBLEM IDENTIFICATION

The PSDDA program is currently out of compliance with national Corps/EPA guidance, and needs to adopt a second bioaccumulation test species to provide a better assessment of bioaccumulation potential. Current national guidance specified in the draft Inland Testing Manual calls for conducting bioaccumulation tests using appropriately sensitive species from two trophic niches, and representing a suspension-feeding/filter-feeding organism and the other a burrowing deposit-feeding organism [2].

The PSDDA program also needs to update its bioaccumulation testing requirements consistent with current national guidance contained within the Green Book and draft Inland Testing Manual [1,2]. However, bioaccumulation testing guidance and human health criteria development are in a state of flux at the national and regional level, and will not be finalized for at least another year. Therefore, formal changes to the bioaccumulation test evaluation and test interpretation guidelines would better be addressed in the future after these issues are finalized. Until more definitive guidance is adopted, the PSDDA agencies will use best professional judgment to conduct bioaccumulation testing and test interpretation.

PROPOSED ACTION/MODIFICATION

To be consistent with national Corps/EPA guidance the PSDDA program proposes to add an additional bioaccumulation test to the current test suite using a deposit-feeding adult polychaete (i.e., either *Nereis virens or Arenicola marina).* This will augment the test currently conducted with the adult facultative deposit-feeding bivalve, *Macoma nasuta.*

Conducting Tier III 28-day bioaccumulation tests on a dredged material management unit will require two separate tests using the adult bivalve, *Macoma nasuta,* and an adult polychaete *(Nereis virens or Arenicola marina).* The test exposure duration will be 28 days utilizing the EPA protocol [5], after which a chemical analysis will be conducted of the tissue residue to determine the concentration of selected chemicals of human health concern triggering the test. The results of the test sediment tissue assays will assess ecological effects through a statistical comparison with bioaccumulation results from a suitable reference area sediment. Protocols for tissue digestion and chemical analysis will follow the PSEP-recommended procedures for metals and organic chemicals [6,7].

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