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M E M O R A N D U M

Date: **August 9, 2006**

To: **Eric Blischke, US EPA Region 10**
Chip Humphrey, US EPA Region 10
Joe Goulet, US EPA Region 10

From: **Bob Gensemer**

Subject: **Suggested Revisions to Measurement Endpoint Table**

cc: **Brad Hermanson, Parametrix**

Project Number: **Portland Harbor RI/FS**

Project Name: **415-2328-007, Phase 007, Task RA24**

This memo summarizes my suggested changes to the latest version of the Measurement Endpoint (ME) table (8 June, 2006) based on the limited comments received to date (Jeremy Buck, Jennifer Peterson, and John Toll from Windward). I do not know if any additional comments might be forthcoming from either LWG or the government team, so I thought I'd summarize what I have received to date given the urgency I heard on the TCT call last week for wrapping this up. The attached ME table highlights these few changes as shaded yellow cells. These changes are also summarized below, along with reasons supporting the proposed changes.

1. *Use of Sediment Quality Guidelines (SQGs) to Predict Fish Effects.* Both Jeremy and John were unsure whether SQGs could be used to predict direct toxic effects to receptors other than benthic invertebrates (particularly, fish). It was pointed out to me a few weeks ago that some of the SQGs (empirical and mechanistic) might be, in part, derived using toxicity test data on fish as well as benthic invertebrates, and so could be applied to direct effects on fish. While most of the data for most of the common SQGs are from benthic invertebrate studies, several SQGs do include some final chronic values and other data derived from fish toxicity tests (Batley et al. 2005). Examples include common empirical SQGs such as ERL/ERM, TEL/PEL, and some of the mechanistic SQGs, particularly PAH narcosis-based SQGs that are based in part upon AWQC for protection of aquatic life (which of course would be protective of fish).

   However, SQGs are typically derived to predict direct effects on benthic invertebrate toxicity and community impacts using benthic invertebrate toxicity testing and community structure data. It would thus be inappropriate to use these SQGs to evaluate direct effects of contaminated sediments on fish (Word et al. 2005). In fact, empirical and mechanistic SQGs have been extensively evaluated on a quantitative basis for their ability to predict adverse impacts, but only to benthic invertebrate assemblages (Ingersoll et al. 2005, Word et al. 2005). Regional SQGs, such as those used in the State of Washington (Washington Ecology 2003), also are exclusively based on invertebrate toxicity data, and are thus not applied to other aquatic organisms or receptors. Therefore, even if some SQGs were derived to a limited extent using data from fish toxicity tests, in my opinion it would not be scientifically valid to use them to predict direct impacts on fish populations in Portland Harbor unless other studies are found that scientifically justify their use in this way. I have been unable to locate any such reference to date.

Finally, any direct effects of sediments to fish receptors in Portland Harbor would be addressed through other lines of evidence (LOEs). These include incidental sediment ingestion via dietary pathways, bioaccumulative effects addressed via tissue-based TRVs, BSAFs, and the food web model. Therefore, I agree with the John and Jeremy that using SQGs to screen for direct effects on fish receptors is not an appropriate use of these guidelines. These LOEs for fish have been removed from the latest version of the ME table.

2. *Juvenile Ammocoete TRV Interpretation*. Jeremy suggested that some minor changes to the wording would be warranted to clarify the goals of the proposed juvenile lamprey toxicity testing. These changes have been made in cell D76.

3. *Shellfish (bivalve) Tissue LOEs.* Jeremy correctly identified that we had not listed all of the potential tissue-based LOEs for crayfish to include field-collected and laboratory-exposed *Corbicula* data from Round 2 studies, as well as BSAFs. Tissue data for the benthic community were also broken down into three distinct LOEs both in the ME table and in the WOE Framework, so these LOEs were added to the shellfish receptor for consistency.

4. *Additional LOEs for Crayfish.* For other benthic receptors (invertebrate and fish), exposure to surface water and transition zone water are considered to be complete and significant pathways according to EPA's December 2, 2005 Conceptual Site Model. This is also true for crayfish, yet the June 8 version of the ME table only presented tissue-based LOEs for this receptor. Therefore, surface water and TZW LOEs have been added for crayfish in the latest version of the ME table (cells D22-23).

If you have any questions or concerns, please let me know. Also, please advise on how you wish to circulate these proposed changes to the ME table for final approvals, etc.

References

Batley, G. E., R. G. Stahl, M. P. Babut, T. L. Bott, J. R. Clark, L. J. Field, K. T. Ho, D. R. Mount, R. C. Swartz, and A. Tessier. 2005. Scientific underpinnings of sediment quality guidelines. Pages 39-119 *in* R. J. Wenning, G. E. Batley, C. G. Ingersoll, and D. W. Moore, editors. Use of Sediment Quality Guidelines and Related Tools for the Assessment of Contaminated Sites. SETAC Press, Pensacola, FL.

Ingersoll, C. G., S. R. Bay, J. L. Crane, L. J. Field, T. H. Gries, J. L. Hyland, E. R. Long, D. D. MacDonald, and T. P. O'Connor. 2005. Ability of SQGs to estimate effects of sediment-associated contaminants in laboratory toxicity tests or in benthic community assessments. Pages 497-556 *in* R. J. Wenning, G. E. Batley, C. G. Ingersoll, and D. W. Moore, editors. Use of Sediment Quality Guidelines and Related Tools for the Assessment of Contaminated Sites. SETAC Press, Pensacola, FL.

Washington Ecology. 2003. Development of freshwater sediment quality values for use in Washington State. Phase II report: Development and recommendation of SQVs for freshwater sediments in Washington State. 03-09-088, Washington Department of Ecology, Bothell, WA.

Word, J. Q., B. B. Albrecht, M. L. Anghera, R. Baudo, S. R. Bay, D. M. Di Toro, J. L. Hyland, C. G. Ingersoll, P. F. Landrum, E. R. Long, J. P. Meador, D. W. Moore, T. P. O'Connor, and J. P. Shine. 2005. Predictive abilities of sediment quality guidelines. Pages 121-161 *in* R. J. Wenning, G. E. Batley, C. G. Ingersoll, and D. W. Moore, editors. Use of Sediment Quality Guidelines and Related Tools for the Assessment of Contaminated Sites. SETAC Press, Pensacola, FL.