

Review of “Sediment Toxicity Identification (TIE) Phases I, II and III Guidance Document”

Overall Questions:

General Impression:

The authors have done an admirable job of organizing a very large body of information and presenting it in a way that is logical, easy to follow and, most importantly, very useable. They have struck a good balance between presentation of specific approaches while emphasizing the value of being flexible in the TIE approach. The many examples from their personal experience with the procedures are an invaluable component of the document.

1. The concepts and assumptions are well developed and explained.
2. The scientific bases for the manipulations involved have been well documented in the literature in most cases. Where uncertain or variable outcomes are frequently encountered, these have been addressed.
3. The methods and the logic of their application are fully explained and scientifically justified when the document is taken in the context of the previous effluent TIE manuals. The authors justifiably assume that the reader is familiar with this background.

Sections 1-5. Introduction; Health and Safety; Quality Assurance; Equipment, Supplies and Facilities; Statistical Methods.

These introductory sections seem complete to me. The issue of Quality Assurance in TIE procedures is particularly thorny given the required balance between specific procedures and the need for flexibility. Once again, I feel that the authors have done a good job in emphasizing those aspects of the procedures that are amenable to conventional forms of Quality Control monitoring, the importance of record keeping and the need to remain flexible in adapting replicate requirements etc. to the demands and limitations of a given TIE.

Section 6. Designing the TIE Approach

This important section gives the investigator basic information important in selection of appropriate media and test organisms for sediment TIEs. Most of us working in this area will have had direct experience with only some of these options. I found this section to be very valuable providing me a number of scenarios I would not have considered. I think the logic of selection of an approach and the relative advantages/disadvantages of approaches is well presented and consistent with other sections.

Details:

Page 13 Section 6.2.1 2nd sentence typos

Table 6-1. List of locations on far left margin of table is shifted out of sync with rest of table.

Section 7: Phase I Overview and Methods: Whole Sediments

In my view, this section is the most important contribution of the document. The whole sediment approaches described here probably represent the information most document users will be the least familiar with. The procedure descriptions are complete and include a great deal of information making them “user friendly”. The ample inclusion of practical guidance, “rules of thumb” for preparation of materials and interpretation of results for procedures that will be unfamiliar to many users makes this section especially valuable. The section seems consistent in organization with the rest of the document.

Section 8. Phase I Overview Methods Interstitial Waters

This section relies on familiarity with effluent TIE procedures and will be more familiar territory for most users than the whole sediment section. As in section 7, a great deal of practical information is included. Special emphasis is placed on those aspects of the procedures which differ from effluent TIE approaches. The section clearly explains the methods and is internally consistent with other sections.

Details

Page 55 Section 8.2.6. Last sentence “be” is missing “should not be so different”

Section 8.2.9. 4th Sentence “the” is missing.... “While the possibility”

Page 64 Table 8-4. Didn’t see any concentration units... ug/L??

Page 65 Section 8.3.5.1. Carbonate buffering equilibria equation has errors (protonated carbonic acid is shown with a charge; “equals” symbol appears to be missing)

Section 9. Phase II Sediment TIE Methods

This section does a good job of presenting toxicant identification procedures of special interest in sediment TIEs. The importance of toxicant bioavailability and the special role of AVS thoroughly explained. As in previous sections, there is a great deal of support information provided to aid the investigator in interpretation. The zero valent magnesium and SPMD approaches are interesting but still seem a bit “ify” to me. I may have missed it, but I don’t recall seeing mention of toxicant-specific inhibitors such as PBO or antibodies. Overall I felt the treatment was complete, explained the role of the procedures in the identification of specific toxicants and was consistent with other sections.

Details:

Page 79. Amount of Mg to add for spiking purposes is in the Fmol/g range???

Page 98. ... “various column sorbents may be useful to remove and isolate nonpolar organics” should that read “polar” organics??

Page 102. Section 9.8.2. might consider a recommendation to use a C18 column modified for high pH use (e.g. Agilent “Extend” columns useable up to pH 12)

Section 10: Phase III Sediment TIE Methods.

This section seems to cover important consideration for the confirmation of identified sediment TIE toxicants. I was glad to see treatment here of the details of conducting spiking experiments, especially the section describing options for introducing various toxicant types into the sediment in a realistic way. The section clearly explains the methods and how they support the rest of the TIE findings in creating a weight-of-evidence conclusion for toxicant identification. The section is consistent with other sections of the document.