

## REVIEWER 4

- Abstract,
  1. pg 6 – revise the estimated cost for Hudson and for addressing sediments nationally. The last estimate I saw for Hudson put the cost at \$2.25 billion. Gary Klawinski is the EPA program manager and could provide the best estimate and best document to cite. I don't know of any recent national analysis of costs to remediate sediments, but I can think of 3 sites that will likely cost over \$1 billion, many more that will hit several hundred million.
- Section 1 - Introduction
  1. Writing style/audience friendly – This section is appropriate for an audience of remedial contractors and analytical laboratories, and it's a good summary/history of the development of passive samplers.
  2. Sufficient information – yes
  3. Calculation Descriptions – These descriptions are well done and as simple as you can make them.
  4. Topics to include/exclude –
    - In Section 1.6 .1, HOCs – the focus is largely on the relationship to toxicity and bioavailability. Consider adding a paragraph to point out how this information might be used, such as in baseline & long term monitoring, as an input to a fate and transport model, or for design of remedial options. For example, Passive samplers provide a monitoring mechanism that is closely related to uptake by organisms, but are not affected by salinity, temperature, oxygen, non-CERCLA related pollution, etc.
    - Section 1.6.2, Metals – This leaves me thinking why bother using DGTs at all. The end of that section states “DGT measured metals provided valuable information on metal speciation, distribution, and flux that is important for quantifying exposure and, more specifically, bioavailable concentrations.” I think it would be good to expand on this, perhaps even provide an example of the use of DGT data.
  5. Any additional resources – The navy has an interactive matrix called ISRAP (<http://www.israp.org/>) that helps RPMs sort out appropriate monitoring tools for different purposes/environments/contaminants. It covers PE and SPME's, as well as a variety of other monitoring tools. It's a good tool for understanding how passive sampling would fit into a monitoring program. That might be good to have listed somewhere, though maybe an appendix would be the best place.
  6. Other comments –
    - Table 1.1 probably requires a caveat - “mention of company names or trademarks does not constitute an endorsement by EPA...” unless that's included elsewhere.
    - Section 1.7, pg 34. The first two sentences of the following quote are confusing because the preceding text is already discussing the choice of K values to use for this particular method. “Another evolving area for passive sampling is the approach used for calculating the C<sub>free</sub> concentration for the target contaminants. As discussed in Section 8, one can assume that equilibrium has

been achieved between the target contaminants and environmental phases (e.g., water, particulates, colloids), and  $C_{free}$  can be calculated using a KPS. Another approach, if equilibrium is not assumed, is to use performance reference compound (PRC) data to adjust the non-equilibrium passive sampler concentration (CPS non-eq) data for equilibrium conditions.” I would edit this such that it is the beginning of a new paragraph and it begins “A common but evolving approach for passive sampling is to assume that equilibrium has been achieved...”

- Section 7 Extraction and Instrumental Analysis of Target Contaminants from Passive Sampling
  1. Writing style/audience friendly – good
  2. Sufficient information – good. The text boxes and tables are particularly useful.
  3. Calculation Descriptions – for equation 7.1, it’s not clear if  $V_s$  is the total volume of solvent for the extraction, the volume of solvent injected in the GC, or the volume of solvent after being reduced. Otherwise, it’s a good description.
  4. Topics to include/exclude – none
  5. Any additional resources – none
  6. Other comments –
    - Section 7.2.1, pg 74 – typos in the text make it illegible.
    - Text box 7.3, pg 78 – just looking to clarify the extraction times – the first extraction is for >12 hours, the 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> extraction are for >10 minutes while agitating? What’s the reasoning behind this method? Why not agitate the first extraction, and is 10 minutes enough for the remaining extractions?
- Section 8 Data Analysis: Calculation of  $C_{free}$  and  $C_{DGT}$ 
  1. Writing style/audience friendly – good
  2. Sufficient information – yes
  3. Calculation Descriptions – good
  4. Topics to include/exclude –
    - It may be worth discussing the use of two samplers of different thicknesses to determine if equilibrium has been reached. Admittedly, it’s easiest to do this ex situ, but it is a simple and robust method to check for equilibrium and it has been done in situ.
    - Also, the intro in section 8.1, pg 86, states “This assumption can be based on previous experience with the passive sampler, the deployment site, or the design of the passive sampler investigation.” I might add as an example that one way to appropriately incorporate time to equilibrium in the design would be to do a small time series test.
    - Section 8.2, pg 87 – Perhaps we should include a discussion of who is responsible for these calculations. I think many RPMs would assume that the laboratory does it, but I think in many cases this is something that should fall to the contractor. Also, it’s implied that the standard analytical QA/QC associated with the EPA methods should be done before anything is calculated, but perhaps it should be explicit that the  $C_{free}$  calculations come after that.

