Adriane,

Here is the information on the XAD.

Thank you,

Karin Feddersen
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From: Feddersen, Karin (ECY)
Sent: Tuesday, March 11, 2014 9:29 AM
To: Fernandez, Arianne (ECY); Bird, Joel (ECY)
Cc: Borgias, Adriane P. (ECY)
Subject: RE: SRRTTF Tech Track Work Group Meeting March 5

Hi Arianne,

Adriane called asking for details on my research, so I am forwarding her what I sent you.

In addition I heard back from Martha Maier of Vista. She will give more details later; but here is her initial take on blanks and larger volumes: "The only real problem is PCB-11: it is always under the low-point, and sometimes non-detect, but it is the most frequent hit. I will mention that we spend a significant amount of time and money on perfecting our cleaning procedures to remove any sources of contamination.

We have handled increased volume by either using larger sep funnels or multiple sep funnels, or by using SPE. There is an increased cost: depending on the % solids, in can take over an 8-hour day to SPE one extraction batch."

Dave Hope added: "As discussed, with our current technology, the standard is naïve. Without using something like CLAM sampling, any value <100 pg./L is blank contaminated. "

Notes on QAPP (I did just a quick scan):

- I just saw in the QAPP that 2-L size bottles are specified, while 1-L size is specified in the RFQQ.
- The labeled compounds should be 25-150% in all samples ***EXCEPT*** in the LCS (OPR). 1668C limits should be used for the OPR – more stringent than 1668A.
- field blanks are mentioned in the QAPP, but not in the RFQQ. Are these already included in the number of samples?
- Matrix spikes are mentioned in the RFQQ, but not in the QAPP.

Thank you,

Karin Feddersen

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From: Feddersen, Karin (ECY)
Sent: Thursday, March 06, 2014 6:08 PM
To: Fernandez, Arianne (ECY); Bird, Joel (ECY)
Subject: RE: SRRTTF Tech Track Work Group Meeting March 5

Hi Arianne,

I wanted to contact all 4 of the technical experts I originally spoke with when drafting language for the Statement of Work. These 4 laboratories are each current participants in international round robin studies conducted on environmental samples for all 209 PCB congeners by EPA Method 1668C.

Two are currently at a technical conference all this week:
Martha Maier, Laboratory Director and CEO of Vista Analytical Laboratory in El Dorado Hills, CA, and
Ron McLeod, Director, Air Toxics and Special Chemistries, Eastern Canada; ALS Environmental in Burlington, Ontario, Canada.

I spoke with Dave Hope, Laboratory Director and CEO of Pacific Rim Labs, Inc., and with Richard Grace, Director - Sales, Marketing, and Service at AXYS Analytical Services Ltd., both in Canada.

We discussed

Quantitation limits (QL) when using one liter and analyzing the CS-0.2 standard in the method, best-case, are ~ 1 to 4 pg/L; but could be higher if there is a lot of interference in the matrix.

total PCB contamination in method blank: typical levels for a 1-L sample are 50 to 150 pg/L. You could get lucky and have a really clean blank, but it's variable from batch to batch. It is impossible to guarantee zero PCBs in any blank or sample. This is mostly due to ubiquitous environmental contamination, the persistence of PCBs on equipment, and the inevitable impurities in the standards – both in the native and in the labeled compounds.

human health criteria: I assume the criteria of 1.3 pg/L is for all 209 PCB congeners?
Richard mentioned the criterion based on the national clean water standard is around 124 or 128 pg/L. So DRBC uses 2 L and blanks are thus well below that limit. The Great Lakes standard is 64 pg/L (303D listing(?)), and that's a little tougher to meet.

Sample collection methods:

Sampling equipment should use Teflon tubing. There is a preservative in silicon that breaks down into PCBs. Dave Hope can tell when silicon tubing has been used by the PCB pattern he sees in the samples.

Using larger sample volumes could lower the QL: you are dividing by the sample volume (number of liters) to determine how many picograms (pg) of PCB are in each liter of sample. Therefore 1 pg of PCB in 1 liter (L) of sample is 1 pg/L. 1 pg of PCB in 2 liters of sample is 0.5 pg/L. When you use larger sample volumes, you need to make your blank calculation commensurate. This will lower your overall blank contamination, because you divide your blank levels by the same amount that you divide the samples by. (If all of the samples in the batch have a higher volume, they will actually use that volume for the QC samples: blank and OPR. Otherwise they use the standard 1 liter of deionized water for the QC, but still divide the results by the volume used for samples. The water is generally *not* the source of background PCBs.)

Caveats:

- Multiple sample containers multiply contamination levels.
- Larger containers are expensive to purchase and to ship.
- Higher volumes may require multiple extractions.
- Higher volumes often require multiple cleanups (and higher costs ~$25 - $50 per liter over 1 liter.)

C.L.A.M.s provide even higher volumes, so lower QLs and lower blank contamination. It is advisable to verify contamination from a blank C.L.A.M., in advance of deployment, or as the method blank. (One C.L.A.M. should also be spiked as an OPR.) Dave Hope is a big proponent of this method.

Another interesting option is high volume (hi vol) filters (XAD). Although I have no idea of the feasibility or cost for this project.

This hi vol method has apparently been around for a couple decades, and therefore is more developed than the C.L.A.M. process. AXYS has a sister company that makes the equipment so they are very familiar with this type of sampling. Richard Grace sent me the information on this sampling system (attached PDF).

Water is pumped through glass wound filters that collect the solids; the dissolved phase is collected on an XAD (a type of resin) column. Both are analyzed. You can thus determine modeling between the solid and the dissolved phase.

AXYS has some clients that ship them a 20-L “POP can”. It is metered and electrically powered so there is a lot of pull – it can sample form a long ways away. Then they ship it to the lab, who performs the actual hi vol filtration process, rather than samplers doing it in the field. In the field you could get more than 20 liters, though, using the hi vol equipment yourself. There is a cost for preparation. It takes 7 days of sequential cleaning; Richard says that the proof specs are very low. It is customized –you determine the QL you want and then the lab will assist in calculating how much water to filter.

This hi vol system is used by DRBC and SFEUI (San Francisco Estuary) in Northern California. Also Monterey Bay and much of the work in the Great Lakes use it.

Thank you,

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From: Fernandez, Arianne (ECY)
Sent: Tuesday, March 04, 2014 2:27 PM
To: Feddersen, Karin (ECY); Bird, Joel (ECY)
Subject: FW: SRRTTF Tech Track Work Group Meeting March 5

Hi Karin,

Thank you for helping out again. It would be great if you and Joel would be able to sit in on this meeting to discuss the QAPP for the task force. The call-in info is below in the forwarded portion of the email. Here are a set of documents that are in draft form. These will be discussed in detail tomorrow.

There are still a lot of questions regarding collection methods (grab vs…) and there is a chance things will change significantly from where they are today. I appreciate your willingness to step up on such short notice.

Arianne