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Dear Sue:

Responses to Field Audit Comments for Multi-City Study

The attachment to this letter provides the responses to specific comments raised in the field audit conducted in Columbus, GA by Mr. Jess Eldridge on July 26 and 27, 1999. Each comment is listed there with the response.

Please feel free to call me at (614) 424-4964 or Rosanna Buhl, the project QA Officer, at (781) 952-5309 with further questions or comments.

Sincerely,

Marcia G. Nishioka
Senior Research Scientist
Atmospheric Science and
Applied Technology

Rosanna L. Buhl
Project QA Officer

MGN/RLB:llg

Attachment

RESPONSES TO MULTI-CITY STUDY FIELD AUDIT COMMENTS

Comment 1a (Air Sampling): Method TO-13 "Determination of Benzopyrene and Other Polynuclear Aromatic Hydrocarbons (PAH) in Ambient air Using GC/HPLC" was cited in the QAPP as the method followed to perform the ambient air sampling. It may be more accurate to state that a modified Method TO-13 was followed in that the compounds of interest for this study are FCs and not PAHs. The analytical portion of TO-13 is detailed and the techniques used to analyze the particulate and PUF filters should be audited. An audit should also include a review of cleaning procedures used to prepare filters for use. TO-13 is part of the EPA's compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. This version was published in 1989. For future reference a new version, TO-13A was published in January 1997 and should be considered as a replacement for TO-13.

***Response**: Battelle's application of Method TO-13 is restricted to the sections that describe the use of the PS-1 air sampler for collection of semi-volatile organic compounds (SVOC). The analytical methods described in TO-13 are not being applied to the analyses of the FCs of this study. Battelle will clarify this point in future references.*

The cleaning procedures for the PUF, filter, and holders are similar to methods used for other SVOC, and included Soxhlet extraction of PUF, solvent rinses of filters, and heat cleaning at 450°C for holders. Field blanks and spikes of both the filter and PUF media were used at each site, so that individual site sample data may be evaluated in the context of these QC samples.

Comment 1b (Air Sampling): Several specific sample set-up requirements were not followed (section 11.3 in TO-13). The sampler was not set up at least 2 meters from any obstacle (11.3.2). The sampler was placed approximately one foot away from a wall that could cause a flow obstruction. The sampler was not equipped with an exhaust hose to prevent recycling of air into the sampler head (11.3.2). A single point flow check was not performed as described in Section 11.2.3 of TO-13. Flow rates were varied from 55, 50, 40, 30 and 20 inches of water using the voltage variator during set-up which is incorrect. It appeared that the five point flow variator adjustments were somehow thought to be the calibration procedure described in section 11.2 of TO-13. A thorough review of TO-13.TO-13A are recommended prior to conducting any further ambient air testing relative to this study.

***Response**: Field crews were instructed to be discrete in the placement of the air sampling equipment such that the sampler would be out of line-of-sight of passers-by and would not interfere with on-site operations. An additional consideration included proximity to the power source. In some cases these requirements resulted in the air sampler being placed less than 2 m from a building. Each field report includes information about proximity of the air sampler to a building. Any air data will be evaluated in light of available placement information, with assessment of possible impacts.*

An exhaust hose should have been used. This omission would be expected to result in slightly lower air concentrations than actual. A thorough review of field crew instructions, SOPs and equipment showed that multi-point checks were performed by field staff as instructed in the project specific SOP for air sampling, which is based on TO-13. This approach is slightly

different from the TO-13 method because on this program only one sample was being collected at each site (city), and the sampler was shipped, or driven, long distances between sampling sites. The initial sampler calibration (11.2.2 of TO-13) with the orifice transfer standard was carried out at Battelle Duxbury prior to shipping the sampler for each sampling trip. Then, at each site, a multi-point check was carried out, rather than a single point check. After a sampling trip, the field-measured values determined in the multi-point check were compared against the initial calibration to verify that the percent difference between the readings was within range (<8% difference). This approach is actually a little more rigorous than TO-13, and was chosen because of the difference between this sampling regimen and the standard fixed-location sampling where multiple samples are collected over a long period of time.

The TO-13 instructions for carrying out a multi-point calibration, or check, indicate that the sampler's flow control valve and the voltage variator are both adjusted to give 5-6 different Magnehelic readings. Both devices, or either device, can be used to adjust the flow. The PS-1 samplers used in this study are equipped with an on/off type valve (1/4 turn from off to on) and cannot be adjusted incrementally. Therefore, Battelle staff adjusted only the voltage variator to obtain the multi-point calibration or check.

Comment 2 (Air Sampling): There is concern that not enough methanol was used to rinse such that liquid methanol dripped off the sampler parts thus rinsing away potential contaminants. The methanol was evaporating nearly as fast as it was being applied. This would only redistribute potential contaminants rather than rinse them away. There is question as to why the air sampler was placed on the ground near the wall of the building.

***Response**: Battelle field staff have been notified of this concern and agreed to ensure that significant solvent run-off existed during all rinsing operations. The issue of sampler placement is discussed above. Note that this was, by design, an opportunistic sample, and would not necessarily conform to the siting criteria applied to locations used for long-term monitoring programs.*

Comment 3 (Water Treatment plant): There is concern about possible residual accumulation of FCs onto the surface of the flexible tubing. Some discussions regarding this concern are warranted. For future reference, it may be advisable to remove any such tubing before sampling.

***Response**: Any material that was part of the site plumbing should be in equilibrium with the water with which it is in contact, and thus removal would not be necessary.*

Comment 4 (Surface Water): The surface water and sediment samples were collected by wading into the shallows near shore. The process of wading stirred sediment from the bottom while water samples were being collected. The suggestion was made that Chris remain still and Kelly hand the bottles to him while he collected the water samples. This technique was used to collect the samples thereafter.

***Response**: Battelle field personnel are trained to sample "upstream" from sediment perturbations caused by wading or shipboard activities whenever possible. Based on this*

comment, the field crew will sample surface water in the future with heightened awareness to sediment resuspension issues.

Comment 5 (POTW Sample): There is concern about possible residual accumulation of FCs onto the surface of the bucket (used for sampling at this site). Some discussions regarding this concern are warranted. For future reference it may be advisable for the sampling crew to provide a remote sampling apparatus such as a telescoping handle.

***Response**: Battelle has added a telescoping handle to its field gear to aid in the collection of samples from confined and/or hard-to-reach areas, such as this POTW effluent collection point. With regard to collection of the POTW samples with an on-site bucket, conversations with the POTW staff indicated that the bucket was permanently set up there for sample collection, and thus it represented a passivated surface.*

Comment 6 (Field Spiking): The addition of the empty vial to the sample raises concern. This procedure follows the QAPP but poses a potential contamination source, that being the outside of the vial. The QAPP specifies the vial be methanol rinsed and wiped dry with a Chem Wipe. What are the precautions that the external surfaces are kept from potential contamination?

***Response**: The outside of each vial was rinsed with methanol after the vial was flame-sealed in the laboratory. The loaded, sealed and cleaned vials were then placed in labelled polyethylene zip-seal bags for transport to the field. The vials were maintained in the polyethylene bags until use. As an added precaution, the vials were solvent-rinsed before use. In the absence of extensive pre-testing of all field protocols, this procedure was adopted as a reasonable and cautionary approach to preventing contamination. The "vial addition" strategy for spike addition to a liquid sample is a rapid and accurate way to add a spike in the field. It provides a quick visual indication and confirmation that the spike solution has, indeed, been added. The addition of the vial assures that all material in the vial is added to the sample. The "vial addition" strategy eliminates the use of syringes in the field. This technique also eliminates the possibility of solvent evaporation and concentration changes that occur when a spike solution vial is opened several times in the field.*