APPENDIX IV

AED LABORATORY OPERATING PROCEDURE FOR OPERATION OF HIGH VOLUME WATER SAMPLER

AED LABORATORY OPERATING PROCEDURE OPERATION OF HIGH VOLUME WATER SAMPLER FOR EXTRACTION OF NON-IONIC ORGANIC ANALYTES

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1.0 OBJECTIVES

The objective of this document is to describe the recommended field use of the high volume water sampling apparatus. This apparatus concentrates particulate material on a glass fiber filter and extracts dissolved non-ionic organic contaminants polychlorinated biphenyls and chlorinated pesticides on polyurethane foam plugs from a large (10-20 L) water sample. Also included in this LOP is information that may be useful in trouble shooting problems encountered.

2.0 MATERIALS AND EQUIPMENT

- High volume pump
- Stainless steel coated hoses
- Filter housing
- Foam plug housings (loaded with extracted plugs)
- Generator
- Pre-combusted Type A/E glass fiber filters 293 mm
- Acetone rinsed stainless steel cans with tops
- TWO 18 L containers with DI water
- Labeling tape
- Lab marker
- Lab notebook
- Gloves (field gloves and plastic lab gloves)
- Large ziplock bags

- Teflon tape
- Duct tape
- Cooler with ice
- Forceps
- Spatulas
- Filter housing wrench
- Crescent wrenches 1 1/4" (2), 11/16", 1", 7/8"
- Two large adjustable wrenches
- One hammer

3.0 PROCEDURE

3.1 Preparation

3.1.1. If the pump, hoses, filter housing, and foam plug housings have not been recently used, they should be cleaned well with Alconox and tap water. If possible, the pump should be set up in the lab and tap water circulated through it. Any parts of the apparatus that can be should be thoroughly rinsed with DI water prior to use.

Note: The stainless steel covering the hoses is frayed in some places. It is advisable to wear work gloves whenever manipulating them to avoid cutting your hands.

3.1.2. Filters should be individually wrapped in clean aluminum foil and combusted in a 450°C oven for 6 hours. After the filters have been combusted it is extremely important that they not be bent, twisted or disturbed in any way. They should be taken out of the oven and immediately placed in a covered container in which they can remain until it is time for them to be used. There should be one filter for each sample, one for each field blank and at least three extra.

3.1.3. Filter containers (stainless steel cans with tops) should be washed, rinsed with DI water and cleaned with acetone.

3.1.4. The procedure for the preparation for the foam plugs is included in the LOP for the analysis of dissolved organics using foam plugs (AED LOP 2.03.018). The housings should be wrapped in clean aluminum foil for transport to the field.

3.2 Field Use

3.2.1. The pump will float when placed in the water however, a safety line should be tied from it to the boat.

3.2.2. Pass the intake hose through the water filling it completely with water. This is necessary to prime the pump. Attach the intake hose to the pump.

3.2.3. Attach the outflow hose to the pump.

3.2.4. Start the generator and start the pump. There should be a strong flow of water out of the outflow hose.

3.2.5. Once the pump is primed, it may be turned off as long as the operators are careful not to allow air to enter the device. At this time, open the filter housing and very carefully place one filter on the screened platform. Hand tighten the screws and then completely tighten them with the filter housing wrench.

3.2.6. Attach the hose from the bottom of the filter housing to the top of the foam plug housing.

3.2.7. To take a seawater sample, place the end of the intake hose in the water making sure not to introduce any air into the system. Start the pump for 5 seconds. Stop the pump. Attach the hose from the outflow of the pump to the top of the filter housing. Open the air bleed valve on the top of the filter housing. Start the pump. Shut the air bleed valve once the air stops coming out (approximately 5 seconds). There should be a trickle of water coming out of the foam plug. A second hose may be attached to the outflow of the foam plug housing and the end placed in the empty 18L DI water container. This will make it possible to measure the volume of water sampled.

3.2.8. Pump 18 liters or other amount of water through the apparatus. Turn off the pump. If the apparatus has not been used recently or was last used in a contaminated area it would be advisable to take another field blank before sampling the seawater.

3.2.9. Open the air bleed valve on the filter housing. Unscrew the housing top and carefully remove the top. Examine the filter to see if it is intact. If it is, use the spatulas to fold the filter and place it in the stainless steel can. Label the can.

3.2.10. Replace the ends of the foam plug housing. Label the housing and wrap it in aluminum foil. Place the filter and foam plug on ice in the cooler.

4.0 QA/QC

The primary concern at the point of collection of samples for further analysis is to verify that the system is free from initial contamination and that no cross contamination occurs between sample locations. This is accomplished by the collection of field blanks as necessary.

4.1 Field Blanks

4.1.1. To take the field blank, place the end of the intake hose in the DI water container making sure not to introduce any air into the system. Start the pump for 5 seconds. Stop the pump. Attach the hose from the outflow of the pump to the top of the filter housing. Open the air bleed valve on the top of the filter housing. Start the pump. Shut the air bleed valve once the air stops coming out (approximately 5 seconds). There should be a trickle of water coming out of the foam plug.

4.1.2. Pump as much of the 18 liters of DI water as you can through the apparatus without getting any air in the system. This should take approximately 10-15 minutes. Turn off the pump. If the apparatus has not been used recently or was last used in a contaminated area it would be advisable to take another field blank before sampling the seawater. Place the intake hose in the second 18 liters of DI water before changing the

foam plug and the filter. If not taking a second field blank, the intake hose may be place back into the seawater.

4.1.3. Open the air bleed valve on the filter housing. Unscrew the housing top and carefully remove the top. Examine the filter to see if it is intact. If it is, use the spatulas to fold the filter and place it in the stainless steel can. Label the can.

4.1.4. Replace the ends of the foam plug housing. Label the housing and wrap it in aluminum foil. Place the filter and foam plug on ice in the cooler.

5.0 TROUBLE SHOOTING

5.1. *Pump is on, no water flow* - The pump has not been primed properly. Purge the intake hose of air and reattach. Hold the outflow hose and the foam plug lower in the boat.

5.2. *The filter housing leaks* - Wipe standing water off of the top of the housing. Use the filter wrench to tighten the screws.

5.3. *Leaks occur at hosing attachments* - Use teflon tape to wrap the male connectors prior to use.

5.4. *Filters break* - Experience has shown the breaking filters usually are the result of rough handling. Place the next filter on and make sure to shield the housing and filter from the wind while putting the filter on.

6.0 REFERENCES

None.