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APPENDICES

APPENDIX 1

STANDARD OPERATING PROCEDURES FOR SEDIMENT CORE COLLECTION

1. All data from sediment core collection will be recorded in the field database (Microsoft Access®) provided by QEA using a laptop computer on the sampling vessel. Upon completion of sampling at one location, all data from the core will be entered into the database and the field log for that location, printed, and the hard copy stored in the field notebook. This will limit the risk of losing core information due to computer failure. Blank field log sheets that can be used to record information manually also will be provided in case of difficulties with data entry into the computer on the boat are encountered. Manually recorded data will be transcribed into the field database at the end of each day.
2. If the water is too shallow for the sampling vessel to navigate (i.e., less than approximately 2 ft. of water), the location will be temporarily abandoned, and the field sampling coordinator will be notified. A sample will be collected subsequently using either a shallower draft sampling vessel or a push core will be taken from the sample location by wading into the river using chest waders. If the location is reached by wading, the GPS antenna will be hand carried to determine the coordinates of the actual sampling location.
3. Using the on-board GPS system, maneuver the sampling vessel to within 5 ft of the pre-programmed target coordinates for each sample location. Secure the vessel in place using spuds and/or anchors. Record in the field log the actual location from which the core was collected and the target location.
4. Use a calibrated steel rod to probe the sediment surface 3 to 5 ft away from the target location to determine the sediment thickness and type in accordance with the Sediment Probing SOP.
 - If the estimated sediment thickness at the probing area is greater than 6 inches, record probing information in the field log and attempt to collect a core using the vibracorer.
 - If the estimated sediment thickness at the probing area is less than 6 inches, additional probing of the sediment surface will be conducted within 10 ft of the target location for deeper sediments. If thicker sediments are found, relocate the boat to the new coordinates and attempt to collect a core. If sediment depth appears to be systematically less than 6 inches, make one attempt at collection with the vibracorer. If 60% recovery is not achieved after one attempt, collect a sample with a ponar dredge.
5. Once the targeted area is deemed suitable for core collection select an appropriate 3-inch (o.d.) core tube type (Lexan® or aluminum) and length based on the probing information. Use Lexan®

tubing in soft sediments and aluminum tubing for coarse sediments. The majority of the locations will be sampled with core tubes approximately 4 ft. long. Deeper sediments will be sampled with core tubes custom cut on the boat from 10 ft tube sections.

6. Mount a clean coring tube onto the vibracoring device, using extension tubes, as necessary.
7. Lower the coring apparatus with the core tube attached vertically through the water column tube end first, until the river bottom is reached.
8. Gently push the core tube into the river bottom while maintaining the apparatus in a vertical position.
9. Attach the vibracoring apparatus to the aluminum extension tube and vibrate the core into the sediment to refusal. Measure and record the depth of core tube penetration into the sediments in the field database.
10. Pull the apparatus upward out of the river bottom (using a winch as needed), and raise it to the surface, while maintaining the core in a vertical position.
11. Before the bottom of the tube breaks the water surface, place a cap over the bottom to prevent the loss of material from the corer. If boats are properly equipped (i.e., can provide safe access for personnel to reach the water), the cap will be placed on the core by reaching down into the water from the sample vessel, otherwise a second boat may be needed. Secure the cap in place with duct tape when brought on board the vessel.
12. Water overlying the core tube in the coring apparatus will be allowed to drain prior to removal of the core tube.
13. Estimate the recovered length of the sediment core and note it in the electronic field database.
 - The length of the cores recovered in Lexan® tubing will be determined by direct measurement.
 - The length of the cores recovered in aluminum tubing will be determined indirectly by tapping the core with a metal rod from the top to the bottom. The spot where the pitch of the sound changes corresponds to the approximate top of the recovered core.

The distance between the top of the sediment in the core tube and the bottom of the coring tube corresponds to the estimated length of the recovered core.

14. Compare the length of the recovered core with the core penetration depth.

- If the recovered length of the sediment core is more than 60% of the penetration depth, keep the core.
- If insufficient amount of material is recovered, discard the core into a re-sealable 5-gallon pail and store for subsequent disposal as PCB-waste at the field processing facility. Rinse the core tube with river water and prepare to make an additional attempt.
 - An additional attempt will be made at a minimum distance of 1 ft from previously attempted locations.
 - A maximum of three attempts to collect a core will be made for a given location ID.
 - Rinse the core tubes with river water between consecutive attempts.
 - If all three attempts to collect a core are unsuccessful based on recovery alone (i.e., less than 60% recovery), retain the final core for analysis and put flag in the database that indicates that the targeted recovery was not achieved.
 - If an acceptable core cannot be collected within 10 ft of the node location, abandon the location and note conditions preventing core collection in the field database.

15. After a successful core recovery enter additional information into the field database:

- Date
- Time of recovery
- Actual coordinates of the sample location
- Water depth (ft)
- Core tube material (aluminum or Lexan®)
- Core penetration depth (in)
- Observations, including probing results

16. Remove the core tube from the extension tube and place a second cap on the top of the core tube. Secure the cap in place with duct tape. Rinse the outside of the core tube with a small amount of river water.

17. Draw an arrow on the core tube with permanent marker to mark the top of the core. Label the core with permanent marker indicating station ID, date, and time.

18. Store the core vertically in a core tube rack on ice. Use a tarp to keep the cores in the dark until they are transported to the field processing facility.

19. At locations where core samples cannot be collected and grab samples will be collected by lowering a ponar dredge until it comes in contact with the sediment and the release mechanism trips. Retrieve the ponar dredge and empty the contents into a new aluminum pan. Seal container with lid and duct tape. Label the container with permanent marker indicating station

ID, date, and location. Place aluminum pan on ice in a cooler.

20. Decontaminate the ponar dredge according to the following decontamination procedure:

- Wash with laboratory grade detergent
- Rinse with distilled water
- Rinse with acetone and allow to air dry
- Rinse with hexane and allow to air dry
- Rinse with distilled water and air dry
- Contain rinsate for disposal at the field processing laboratory

20. At the end of each day, an electronic copy (disk) of the field log that includes the information recorded for each core sample collected that day will be provided to the processing laboratory coordinator. Additionally, a hard copy of the field log will be printed out. The hard copy will serve as a back-up to the electronic copy, as well as the chain of custody form from the field to the processing laboratory. This form will be signed by sample collection personnel and core processing personnel at the time that the core processing personnel take custody of the cores. A copy of the signed field log form will be maintained in the processing laboratory.