



US Army Corps
of Engineers
Waterways Experiment
Station

Zebra Mussel Research

Technical Notes

Section 1 — Environmental Testing

Technical Note ZMR-1-12

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Collection of Zebra Mussel Samples for Contaminant Analyses

Background Zebra mussels are European freshwater bivalves that are now in the Great Lakes and central rivers of the United States. They have been shown to be good bioaccumulators of aquatic contaminants such as pesticides and other organics and metals (Bruner, Fisher, and Landrum 1992, Reeders and Bij de Vaate 1992). Prior to developing disposal strategies for these animals, it is necessary to obtain data on the potential contaminant burden of zebra mussels from different habitats.

Purpose The purpose of this technical note is to describe methods for shipping mussels to a laboratory for contaminant analysis. Sediments from the same sites where zebra mussels were collected should also be obtained for contaminant analysis. Contaminants of interest include polychlorinated biphenyls; pesticides such as chlordane, DDT, and dieldrin; metals and hydrocarbons associated with oil pollution; and polycyclic aromatic hydrocarbons. The chemical analyses will be performed by the U.S. Environmental Protection Agency (USEPA) laboratory at Grosse Ile, MI, and the U.S. Army Engineer Waterways Experiment Station (WES), Vicksburg, MS.

Additional information This technical note was written by Dr. Henry Tatem, WES, (601) 634-3695. Dr. Ed A. Theriot, WES, (601) 634-2678, is the Manager of the Zebra Mussel Research Program. For information on shipping zebra mussels, contact Dr. Tatem.

Procedures for collecting samples The steps for collection of clean zebra mussel samples for chemical analysis are taken from a protocol on zebra mussels developed by the USEPA. The collection jars and lids will be supplied by the USEPA and the WES, and will have already been washed and rinsed. Five jars will be supplied for each collection site. Four jars will be filled with whole, rinsed zebra mussels; the fifth jar will be filled with bottom sediment from the same location as the zebra mussels. The sediment sample should be from immediately below the zebra mussels. If this is not possible, sediments should be taken from as close as possible to the mussels. The full jars should be covered with aluminum foil and the lid prior to placing them in an insulated shipping container such as an ice chest or styro-foam container. Blue ice or freezer packs can be used to keep the samples cool.

If samples are to be held overnight prior to shipping, they should be placed in a freezer or at least maintained on ice.

Zebra Mussel Collecting Procedures

1. Do not open jars before introduction of zebra mussel or sediment.
2. Rinse mussels with ambient water before putting them in the jars. The sediment samples should not contain mussels, rocks, or other debris.
3. Fill jars with mussels or sediment at least half full.
4. Place aluminum foil and lid on the jar and label sample (date, location, etc.).
5. Place jars in plastic bags to minimize breakage and place in an ice chest.

- References** Bruner, K. A., Fisher, S. W., and Landrum, P. F. 1992. "Bioaccumulation and Trophic Transfer of Hydrophobic Contaminants by the Zebra Mussel, *Dreissena polymorpha*," Presentation, SETAC 13th Annual Meeting, November 1992, Cincinnati, OH.
- Reeders, H. H., and Bij de Vaate, A. 1992. "Bioprocessing of Polluted Suspended Matter from the Water Column by the Zebra Mussel (*Dreissena polymorpha* Pallas)," *Hydrobiologia*, Vol 239, pp 53-63.