

EnviroMatrix Analytical, Inc.

Microbiology Sampling Protocol Sheet

The following guideline is provided to assist our customers in the sampling and delivery of microbiology samples. The guidelines are derived from the Standard Methods for the Evaluation of Water and Wastewater, Section 9060, 20th Edition, 1998.

•**Potable (Drinking) water:** When collecting samples from a tap, open tap fully and allow the water to run for 2-3 minutes. Reduce the flow to prevent splashing in the bottle. When sampling from a mixing faucet remove faucet attachments such as screen or splash guard. Run hot water for 2 minutes followed by cold water for 2-3 minutes and collect sample as indicated above. Do not sample from leaking taps that allow the water to flow over the outside of the tap. If sampling from a well with a mechanical pump; allow the water to flow for 5-10 minutes (or until water temperature has stabilized) before sampling from the sampling port. If the well is manually purged, sample with only a pre-sterilized sample bailer, or attach a weight to the outside of the bottle and lower directly into the well.

Drinking Water Containers: Drinking water samples should be collected in 120 ml containers that are pre-sterilized and pre-preserved with sodium thiosulfate and filled to the 100 ml 'fill line'. The sodium thiosulfate preservative is used to remove any residual chlorine that may interfere with the analysis. These containers are provided for our clients at no charge. A 120 ml sample container is adequate for one method only. An example would be 100 ml for total and fecal coliform by SMEWW 9221. Two separate 120 ml containers would be needed for total and fecal coliforms by SMEWW 9221 and heterotrophic plate count by SMEWW 9215 B.

Sampling Techniques: When the sample is collected, **DO NOT** rinse the bottle or overfill the bottle. The bottle contains sodium thiosulfate preservative. The sample bottle should have a small amount of headspace (at least 2.5 cm of air) to facilitate mixing of the sample. **DO NOT** touch the inside of the bottle with anything but the water to be sampled. Keep the bottle closed until the sample is ready to be collected.

● **Raw water supply (source water):** For samples obtained directly from a river, stream, lake, reservoir, spring, or shallow well, obtain samples representative of the water that is the source of supply to consumers. Avoid collecting samples too near the bank, or too far from the point of draw-off, or above or below the point of draw-off.

● **Surface water and marine water:** Depending on the information desired, consider including baseline samples that are collected upstream or up-current from discharge points, storm drains, or other areas that may have influences upon the area of concern. Samples should be collected using a pre-sterilized collection device or by obtaining the sample directly with a pre-sterilized sample container. Remember, the more a sample is exposed to other devices, the higher the chances of cross-contaminating the sample.

● **Bathing beaches:** Sampling locations for recreational areas should reflect water quality within the entire recreational zone. For beaches, include samples from the water-beach interface because of the potential for exposure to young children at the water's edge. Include sites from upstream peripheral areas and locations adjacent to drains or natural contours that would discharge storm water collections or septic wastes.

- **Surface water containers:** Surface waters or marine waters should be collected in pre-sterilized 120 ml containers or greater depending on the analyses required. These containers do not require preservation other than the storage and holding time requirements.
- **Sampling considerations:** Always take into account the location and the technique used to collect the sample. If you are using a sub-sampling device, ensure that the device has been sterilized prior to collecting the sample. If collecting samples from a boat; ensure that the sample is collected from the upstream or up-current side of the boat. In general, consider anything that touches the water sample other than the water sample and the bottle a potential for contamination.
- **Sampling at depth:** Special discreet-depth sampling devices are available from environmental supply companies. The most common is the ZoBell J-Z (Van Dorn) sampler. Please feel free to contact EMA if you need assistance locating one of these devices.

• **Sediment/Biosolids:** The bacteriology of bottom sediments is important in water supply reservoirs, in lakes, rivers and coastal waters used for recreational purposes, and in shellfish growing waters. Sediments may provide a stable index of the general quality of the overlaying water, particularly where there is great variability in its bacteriological quality. Microbiological examination of biosolids from water and wastewater treatment processes is desirable to determine the impact of their disposal into receiving waters, ocean dumping, land application, or burial in landfill operations.

- **Sampling frequency:** Sampling in reservoirs and lakes may be related more to seasonal changes in water temperatures and stormwater runoff. Bottom sediment changes in river and estuarine waters may be more erratic and can be influenced by stormwater runoff, flow velocity, and change in the quality of effluent discharges.
- **Sample collection:** Collect and handle biosolids for microbiological analysis with less than 7% total solids using the procedures discussed for other water samples. For biosolids with > 7% total solids and exhibiting a semi-solid state, use cross-section sampling to determine distribution of organisms. For more in-depth information on sampling biosolids with no free liquids, please contact EMA to speak with our microbiology department.

Holding time and transport: Microbiology samples should be analyzed as soon as possible after sample collection. It is recommended that all samples be placed in an ice filled cooler $\leq 10^{\circ}\text{C}$ for transport to the lab. If it is known that the results will be used in legal action, the samples should be delivered within 6 hours of sampling using correct chain-of-custody procedures. Samples analyzed between 6 and 24 hours after sampling are considered useful but may be questionable. Analyzing any samples after 24 hours of holding (outside of drinking water samples) is not recommended. These samples would be considered unacceptable, should be used for qualitative purposes only, and will only be processed upon the clients request. Do not exceed 30 hours hold time from collection to analysis for coliform bacteria analysis for drinking waters. Do not exceed 8 hour holding time for HPC analysis.

Chain-of Custody documentation: The chain-of-custody **MUST** be filled out completely. The sample I.D., sample date, sample time, and the analyses requested must be indicated at the time of sample receipt at the laboratory. **For drinking water samples, a phone number must be included where the client can be notified (directly) at all times for positive coliform results. Voice mail or answering machine messages are NOT acceptable.**

Analyses requested and reporting: Several different microbiology methods are available and are used for different purposes depending on the type of water. Please refer to the microbiology technical fact sheet for information on the methods available and the type of reporting. Please feel free to call us if you have any questions on the methods available.

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