

Bacteroidales - Source Tracking in Water

The order *Bacteroidales* (*Bacteroides* and related genera) are commonly found in feces of animals including birds and mammals. They have host specificity making them useful in fecal source tracking. *Bacteroides* are anaerobic microbes that have very limited reproduction in receiving waters and are not easily cultivated in the laboratory. Host-specific primers and probes based on published sequences are used in source tracking using marker genes for ruminants, humans, geese, dogs, and gulls. Limitations of this approach include a lack of markers for many species, especially wildlife.

For the past several years, Water Board staff have used such data for identifying and characterizing sources of bacteria, developing bacteria TMDLs, and evaluating effectiveness of corrective actions in various watersheds such as: Tomales Bay, Richardson Bay, San Pedro Creek and Pacifica State Beach, San Vicente Creek, Half Moon Bay, San Geronimo, and Sonoma Creek.

Sampling Procedure (See: Recommendations in SIPP Manual and EPA Method B)

1. General Considerations for All Samples

- Obtain sufficient sterile sample bottles¹ prior to each sampling event (including bottles for field blanks and field duplicate samples)

¹DE-chlorination agent as a preservative is not required when sampling surface water for Bacteroidales

- Label each bottle using water resistant pen and labels provided with sample bottles:

- a) Date and time of collection
- b) Sample location or ID#
- c) Sample Type: e.g., surface water (SW)

- Wear gloves to begin sampling and change gloves between sampling stations.
- A sampling device such as a bucket is required for hard-to-reach stations (such as a dock, bridge or bank adjacent to surface water)
 - Laboratory can provide sterile deionized water for rinsing the sampling device between sampling stations. Rinsing with isopropyl alcohol prior to and between samples is recommended followed by a rinse with sterile deionized water.
- Appropriate Cooler size with blue ice or ice (Keep ice in bag to prevent melt water from contaminating samples)

2. Specific Sample Collection Procedures

1. Collect samples by hand or using a sampling device if the sampling site has difficult access.
2. Samples should not be composited. Such samples provide no information on the range of values in individual samples.
3. Surface water samples should be collected at 6-12 inches below the water surface, avoiding any floating material.
4. Remove the seal completely from the bottle before sample collection.
5. Remove the lid carefully. Do not touch the inside of the bottle or lid.

6. Hold the sample bottle near its base and plunge it below the water surface with the opening down, then invert to fill.
7. The sample should be collected with a single stroke.
8. The sample bottle should be filled to just above the 100 ml mark.
9. Replace cap and tighten securely.
10. If a sampling device is used, fill the sample bottle from the device. (Be sure to rinse with alcohol followed by sterile water between each sampling location).
11. Record sample information on the chain of custody form provided.
12. Place samples in a cooler with ice to keep water samples at less than 10°C during transit to the laboratory. Do not freeze the samples. Ensure that sample bottles are tightly closed and are not totally immersed in ice water during transit.
13. Samples must be filtered within 8-24 hours after collection.

For additional information contact the laboratory

82 Mary Street
San Francisco, CA 94103
(415) 882-1690