MBAS
Monterey Bay Analytical Services
4 Justin Court, Suite D
Monterey, CA 93940

Total Coliform bacteria and *E. Coli* Test

Purpose

Outbreaks of enteric (intestinal) and opportunistic diseases caused by waterborne microorganisms still occur even in the most advanced nations with superior sanitation practices and sophisticated treatment and testing programs. Waterborne diseases include dysentery, hepatitis, cholera, cryptosporidiosis, and giardiasis. These diseases are spread by water contaminated with fecal material from humans and other warm-blooded animals.

It is not feasible to routinely test drinking water for every possible disease-causing organism. Instead, water quality standards are based on the concept of **"indicator**" organisms. According to this concept, drinking water is tested for organisms, which are not necessarily the cause of disease, but are associated with contaminated water and indicate the potential for disease transmission. The most commonly used indicator organisms for drinking water are total coliforms and *E. coli*.

The **total coliform** group is the broadest indicator classification and includes bacteria found in soil and vegetation, coliforms which originate from the intestinal tract of warm blooded animals are known as **fecal coliforms**. ***E. coli*** bacteria is a representative of the fecal coliform group.

Sample Collection

Water samples taken for coliform bacteria testing must be collected and handled carefully in order to insure that the sample taken truly represents the bacteriological quality of water in the system. The following procedure will help you in this regard:

1. Sterile containers provided by Monterey Bay Analytical Services must be used. Do not touch or otherwise contaminate the inside of the container, the inside of the cap, or the treads of the container. The container contains a chemical to neutralize chlorine; do not rinse the container.
2. Select a faucet that is used frequently – DO NOT take a sample from a faucet that is leaking around the handle. DO NOT take a sample from a dirty faucet or one that is equipped with an aerator and/or screen. Also, do not take a sample from a swing type faucet. Never take a sample from a hose or other device, which is attached to the faucet - - - remove them first.
3. When you have found a suitable faucet, open it just enough to produce a flow which can be collected without splashing. Let the water run for 2 to 3 minutes. Carefully fill the container up to the 100-ml mark. Immediately replace the cap (tightly), and label the sample with well identification, description of sample point, date and time of collection, and name of sample collector.
4. Complete the Chain-of-Custody form including mailing address, name of sample collector, well number, description of sample point, date and time of collection, and test ordered (i.e., "coliform present/absent (P/A)" or "coliform count (QT)")

Care of Sample

Finished drinking water samples must be analyzed by Monterey Bay Analytical Services within 30 hours of collection. Raw water samples must be analyzed within 8 hours of collection.

Samples which cannot be delivered to Monterey Bay Analytical Services within one hour after collection must be refrigerated (e.g., iced cooler) and held at 10 degrees C during transit. Failure to follow these instructions will compromise the analyses. Temperatures of all water samples for coliform analyses are taken upon receipt by the laboratory and recorded on your chain of custody.

Interpretation of Results

Coliforms other than the fecal group are ubiquitous and it is impossible to eliminate them entirely from a water system. State and federal drinking water standards allow total coliforms to be present in up to 5% of samples tested by the water system each month; however, small drinking water systems which test fewer than 20 samples per month should have **no coliform positive** sample per month. Fecal coliforms (*E. coli*) should never be found in drinking water; if fecal coliforms are present, they indicate an urgent health threat and the water should be considered non-potable until properly treated. For further information on treating a small water system, consult Monterey Bay Analytical Services.