

Date: 5/12/09

To: Drinking Water Systems

From: Joseph Freda, Ph.D.

Re: Total Coliform Samples

Each year, positive “Bac-T” samples generally start appearing in the spring. I presume that the higher air temps are simulating bacterial growth, causing potential contaminations issues. Listed below are several helpful hints on how to reduce the chances of contaminating your samples.

**Why do we measure total coliform?** Total coliform bacteria are not harmful to humans, and are found on most surfaces and in water. This group of organisms have been chosen as an indicator organism to check on how well you are dis-infecting your water. The reasoning is, if you kill off all the total coliform, then you also killed off pathogenic bacteria and viruses.

**Why is it so easy to contaminate samples?** Coliform bacteria are found on the water outlet, your hands, the ground, and just about every surface. When the water enters the collection container, it is instantly de-chlorinated, so any bacteria accidentally washed into the container will survive and show up in your test results.

**Clean Hands!** The collector's hands must be “surgically clean” during the collection process. Many clients say they wash hands thoroughly before collecting samples, but this is inadequate in most cases. First, everything you touch (door handle, steering wheel, cooler) after washing your hands re-contaminates them. Also, no amount of washing will completely clean hands and fingers that have been digging in the dirt and fixing water lines. My suggestion is that a fresh pair of latex gloves be put on immediately before each sample is collected. The gloves can be kept in the sample cooler with the containers and removed and put on at the water outlet (not in the truck).

**Clean Containers!** Sample containers are sterile on the inside until opened. They must not be opened until immediately before filling, and you should never put your fingers around the opening or inside. We put your sample containers inside a zip-lock bag as a double layer of protection. We suggest leaving the containers inside the zip-lock bag until immediately before use. If you put them in your pocket, the truck seat, an outside surface, etc, before collection, you run the risk of contaminating the outside of the bag. This contamination can rise off into the sample during collection or analysis. We suggest carrying your cooler to the collection site, removing the container, filling it, and

immediately returning it to your zip-lock bag/cooler. Therefore, the only thing that the bag touches is your gloved hand and the inside of the zip-lock bag.

**Transport of the Samples.** The next stage at which contamination can occur is during transport to our laboratory. If you are dropping off the samples, keep the samples in the zip-lock bag/cooler until you arrive at our lab. If we pick them up, we will remove your zip-lock bag and place it in our dedicated drinking water cooler. Minimizing the handling of the samples will definitely reduce the chances of contamination.

**Maintain your chlorine levels!** When chlorine levels drop below 0.5 mg/l, we generally see a significant increase in the number of positive samples. While every system is different, levels above 1.0 mg/l provide adequate dis-infection.

**What happens if you test positive?** If the initial test of one of your distribution samples is positive (total coliform present), we are required to confirm the result by running a second test for total and fecal coliform on the original sample that we received from you. If this confirmation test is positive, then we will contact you and you will need to collect additional samples from the original location, and upstream location, and the downstream location. We are required to call ADEM to report your sample results. Depending on your results and the number of samples involved, you might be required by ADEM to collect additional samples and/or post public notice. We will assist you in determining what actions to take.