Microbial Sample Collection

Example Standard Operating Procedure

Selecting a Sample Site

- Collect from a sample location identified in the system's Sample Siting Plan (SSP).
- Select a tap that has all the following features.
  - Free of leaks.
  - A downward-facing tap approximately 12-18 inches above the floor or ground.
  - Constructed of material that will allow it to be heated with a torch or cleaned with a strong bleach (chlorine) solution.
  - Free of obstructions such as tall grass or shrubbery.
  - Free of any attachments such as a water hose, water softener, aerator, etc.
  - At a customer's premise, dedicated sampling tap or other active service connection.

Sample Bottles

- Use only sterile bottles obtained from a laboratory accredited by TCEQ to perform total coliform and *E.coli* analysis of drinking water.
- Do not use any bottles that are:
  - damaged,
  - have a broken seal, or
  - expired.
- Ensure that extra bottles are on-hand in case of sampling issues.
- Store unused sample bottles in a cool and dry area away from high heat, damp conditions, direct sunlight,or contact with contaminants.

Before Sample Collection

- Wash your hands before collecting a sample.
  - Gloves (nitrile or latex) can also be used when collecting samples.
- Allow the sample tap to run (flush) for 3-5 minutes before disinfecting the tap.
  - Flush the tap until there is a change in temperature.
- Measure the disinfectant residual to ensure it is at or above the minimum of 0.2 mg/L free chlorine or 0.5 mg/L total chlorine and record this value on the Microbial Reporting Form (MRF).
  - If the chlorine residual is below the minimum, continue to flush for an additional 3-5 minutes.
- Disinfect the sample tap by flaming the tap with a torch or using a strong bleachsolution.
  - Flame the tap for about 30 seconds; this is preferable as it works immediately.
  - If utilizing a bleach solution, ensure that it is in contact with the sample tap for several minutesbefore flushing. Follow manufacturer's instructions for disinfecting.
- After disinfection, turn on the water and reduce the flow of water to a smooth, pencil-sized stream to avoid splashing during collection.

Sample Collection

- Use caution when sampling on windy or rainy days. Avoid whenever possible.
- Do not touch the inside of the sample bottle or its cap.
- Do not place the sample cap on the ground during sample collection.
  - Hold the cap in your hand with the interior surface of the cap facing down during samplecollection.
- Treat the bottle with care to prevent contamination.
- Never rinse or fill the sample bottle completely.
  - The bottle contains a tablet, powder, or liquid that acts as a dechlorinating agent.
  - Rinsing or overfilling will remove or dilute the dechlorinating agent.
  - Without a dechlorinating agent, the sample may arrive at the laboratory with a chlorine residualwhich will cause the sample to be rejected.
- Fill the sample bottle to slightly above the 100 milliliter (mL) fill line.
  - The sample should be slightly over the 100 mL line but below the neck of the bottle.
  - This provides sufficient volume to perform testing for absence of a chlorineresidual as well as maintaining sufficient volume (100 mL) for testing for coliform bacteria.
  - Inappropriate sample volume will cause the sample to be rejected by the laboratory.

After Sample Collection

- Immediately place the sample in an ice-chest using reusable ice packs.
  - Avoid using ice, if possible.
    - If ice is used, place the sample bottle in a clean waterproof plastic bag ensuring the top of the bag is sealed and not submerged in water created by melting ice, as this could potentially contaminate the sample.
- Do not transport or store drinking water samples with non-potable water samples.
- Do not allow samples to freeze.
- Complete the MRF for the sample collected and Public Water System (PWS) information.
- Verify that the MRF is completed correctly.
  - PWS ID number and name is accurate.
  - Sampler name and signature are included.
  - Operator license # is included, if applicable.
  - Time and date of sample collection are included.
  - Field measured chlorine residual and type is included.
  - Sample type is identified.
    - Compliance: Raw, Repeat, or Routine.
    - Non-compliance: Special or Construction.
  - Originating sample information is provided for repeat, triggered, or replacement samples.
- Deliver samples to the lab the dayof collection if possible or ship via overnight delivery. Maximum hold time for drinking water samples is 30 hours from collection to beginning of incubation.
  - Samples deemed too old or improperly preserved will be rejected by the laboratory.
    - Rejected samples must be recollected within 24-hours.
    - If your local, accredited laboratory is closed and the sample cannot be submitted within 24-hours, contact the TCEQ for guidance at TCRData@tceq.texas.gov.

Special Circumstances

- If a replacement sample is required for a rejected sample, ensure the MRF is completed properly.
  - The sample should be listed as the same sample type as was rejected.
    - If a “Routine” sample was rejected, its replacement should also be marked “Routine”.
  - The “Replacement” box must also be checked.
- If a routine sample is positive for total coliform bacteria and/or *E. coli*.
  - Collect three repeat samples according to your SSP.
    - One sample from the original sample site,
    - One sample upstream within five connections of the original sample site, and
    - One sample downstream within five connections from the original sample site.
  - Continue collecting repeat samples from the same locations until a full set are negative for both total coliform bacteriaand *E. coli,* or until a treatment technique exceedance triggers an assessment.
  - If the system uses groundwater wells, they must comply with Groundwater Rule triggered source monitoring.
    - One raw well sample per well is required for each routine distribution positive sample.
    - If a well was not in use within 24 hours of the routine distribution positive sample and is listed as active in Texas Drinking Water Watch, please complete and submit *Groundwater Rule Notification of Inactive Well(s) for Triggered and Assessment Source Monitoring* (TCEQ Form 20891).
    - If a groundwater system uses only one well and serves 1,000 people or fewer, the system may use the raw well sample to count as both a repeat and a triggered source monitoring sample.
  - If the system receives water from another system (provider) that uses wells, the system must notify provider within 24 hours of being notified of the positive coliform distribution sample.
    - The provider must collect a raw well sample from each of its wells.
- The sample ID of the originating sample must be included for all replacement, repeat, and triggeredraw samples.