



THE MEADOWS CENTER FOR WATER AND THE ENVIRONMENT

TEXAS STREAM TEAM

Texas State University, 601 University Drive, Riverside Apt C4, San Marcos, TX 78666 • (877) 506-1401 • Email: txstreamteam@txstate.edu

Water Quality Monitoring Procedures—Field Reference Guide

Before Monitoring

Calibrate **Conductivity Meter** with Conductivity Standard Solution no more than 24 hours before use. Record Conductivity Standard Solution under *Standard Value* in Meter Calibration box on monitoring form. Record any expired reagents on the monitoring form if necessary.

1. Using Standard Solution, rinse beaker, thermometer, and meter probe TWICE.
 2. Hold beaker by top edge and fill to 50 mL level, insert thermometer and meter probe, and stir gently to remove bubbles from probe.
 3. Read thermometer to nearest degree and record *Standard Temp* (°C).
 4. Turn meter on and slowly stir for 2 minutes. Stop stirring, hold meter probe 1/2 inch off bottom and sides, and record *Initial Meter Reading*.
 5. If meter is not reading the Standard Solution value, adjust buttons underneath the meter cap until the reading is equal to the standard value.
 6. Turn meter off and record Standard Solution value under *Meter Adjusted To*. Shake excess solution off probe, rinse with distilled water, and replace cap.
-

If using a **pH Meter**, calibrate it using the pH calibration Standard Solution.

1. Record *Standard Value* (usually 7.0 su) on the data sheet.
2. Rinse the beaker and meter probe TWICE with a small volume of Standard Solution.
3. Pour about 50 mL of Standard Solution into the beaker. Submerge and hold the meter in the solution.
4. Turn the meter on. Hold the meter 1/2 inch off the bottom and swirl gently, dislodging any air bubbles. Stop stirring. Wait at least one minute for the display to stabilize. Record the *Initial Meter Reading*.
5. With the meter still submerged, begin calibration by pressing the CAL button. The number should begin flashing and will approach 7.0. It will rest on a number and stop changing. The number will continue flashing.
6. Pressing the HOLD button. The reading should immediately change to 7.0 or the Standard Solution value.
7. Turn the meter off. Record the new value under *Meter Adjusted To*. Rinse the beaker and meter TWICE with distilled water.

At Site

Record **Field Observations** and **Comments**.

Hang thermometer out of direct sunlight, wait 2-3 minutes, and record **Air Temperature** (°C) to nearest 0.5 degree.

Remove sunglasses and check **Water Transparency** with Secchi Disk, in water shaded from the sun.

1. Lower Secchi Disk in water until it disappears, mark depth, raise Disk until barely visible, and mark depth.
2. Average both depth readings and record *Secchi Disk Transparency* to nearest 0.01 meter (1 centimeter).

Measure the water's **Total Depth**.

1. Lower disk into water again until cord becomes slack, then raise until straight. Mark and record *Total Depth* (meters).

To do a **Bucket Grab**, rinse water bucket TWICE and discard rinse water downstream.

1. Collect bucket water sample from a depth of 0.3 meters (about 1 foot).
 2. Check **Water Temperature** in the bucket sample with thermometer for 1-1/2 minutes.
 3. Read thermometer while it is in the water. Record *Water Temperature* (°C) to nearest 0.5 degree.
-

Measure **Conductivity** out of direct sunlight and wind.

1. Rinse sample beaker and meter probe TWICE in bucket sample water, discard water downstream.
 2. Fill beaker with 50 mL of sample water, insert meter, and remove bubbles. Turn meter on, and stir gently for 2 minutes. Stop stirring, hold probe 1/2 inch off bottom and sides, record reading under *Conductivity* (µS/cm), and mark *Tester* option. Turn meter off, rinse with distilled water, and replace cap.
-

Measure **pH** (**Color Comparator** method).

1. Rinse test tube and cap TWICE in bucket sample water.
2. Fill tube with sample water to indicator line.
3. Invert pH Wide Range Indicator bottle a few times, add 10 drops to sample, cap tube, and invert 10 times.
4. Insert the tube in Viewer, remove cap, and hold up to white background. Estimate to nearest 0.1 su (standard units) and record under *pH*.

Measure **Dissolved Oxygen** (DO).

1. Rinse both sample bottles and caps TWICE in bucket sample water, dispose of rinse water downstream.
2. Fill each bottle and cap below surface, and then check for bubbles.
3. Put on safety goggles and gloves and uncap both bottles.

Fixing the DO Sample:

1. Add 8 drops Manganous Sulfate Solution [pink] to each bottle. The bottle will overflow slightly.
2. Add 8 drops Alkaline Potassium Iodide Azide [clear]. Cap both bottles, slowly invert 25 times. Allow precipitate to settle below bottle shoulders, then invert 10 more times and allow settling again.
3. Add 8 drops Sulfuric Acid [red top bottle]. Cap both bottles and slowly invert for minimum of 3 minutes. Check for any solids remaining. Sample is now "Fixed" and can be finished at home within 4 hours if weather is bad or other conditions warrant.

Titrating the DO Sample:

1. Rinse one vial TWICE with a small portion of fixed solution sample #1. Dispose of rinse solution in Waste Container. Fill vial with fixed solution sample #1 to 20 mL line, and cap. Repeat for sample #2 and set aside.
2. Fill Titrator with Sodium Thiosulfate. Expel air bubbles from Titrator barrel. The plunger ring should be at 0.0 mark. Place Titrator into hole in vial cap. Add 1 drop of Titrator solution to vial and swirl to mix. Add another drop and swirl again. Repeat until the yellow-brown solution turns a pale straw color.
3. Uncap vial with Titrator still inserted, and tilt open keeping tip suspended above mouth of vial. Add 8 drops of Starch Indicator Solution, cap and swirl to mix.
4. Continue Titration drops and swirls, one drop at a time, until the solution becomes clear. Check against white background for any remaining color.
5. Read and record total number of units at plunger ring to nearest 0.1 mg/L under *1st titration*. Eject remainder of Titrator Solution into vial and dispose of vial solution in Waste Container.
6. Repeat Titration process (steps 1-5) with fixed solution sample #2 and record these results under *2nd titration*. This second result must be within 0.5 mg/L of the 1st titration or you must repeat the test.
7. Calculate the average of both Titration results to nearest 0.1 mg/L (round up, not down) and record under *Dissolved Oxygen*. Rinse both DO bottles, titration vials, and all caps with distilled water before storing back in kit.

Environmental Problems Call List

Local Government Assistance: (800) 447-2827

Texas Commission on Environmental Quality: (512) 239-1000

Texas Parks and Wildlife: (512) 389-4800

Kills and Spills 24-HOUR: (512) 389-4848

If using a **pH Meter**:

1. Remove the meter's protective cap.
2. Rinse the beaker and meter twice with a small volume of sample water.
3. Fill the beaker halfway and then submerge and hold the meter in the sample water.
4. Turn the meter on by pressing the ON/OFF button. Hold the meter 1/2 inch off the bottom of the beaker and swirl gently, dislodging any air bubbles that might have formed. Stop stirring. Wait 1 minute for the display to stabilize, and then check the reading. Record this number as your *pH* value (standard units). Turn the meter OFF. Place the cap on the meter.
5. Complete a post-calibration check. Rinse the probe in distilled water, place in beaker with 50 mL of pH Standard Solution. Allow the reading to stabilize and then record the *Post Test* value on your data sheet. If the value is not within 0.2 su of the Standard Value, the pH reading may not be accurate and representative. Note this under *Comments*.

(White background for color comparison.)

