

## Tips on More Accurate Turbidity Measurement

Water has a cloudy, turbid appearance when suspended particles are picked up as it travels in streams and rivers. It can be composed of a variety of different types of particles, including clay, dirt, organic debris, lime scale and corrosion products, such as rust, lead and copper oxides.

The US Environmental Protection Agency (USEPA) requires that all municipal water utilities conduct a daily test for turbidity. Although not considered harmful, turbidity can shield harmful contaminants like viruses and bacteria from disinfectants. Turbidity particles also absorb and carry other dissolved contaminants throughout a water supply system. Methods commonly used to remove or reduce turbidity upstream of any cross flow membranes, such as reverse osmosis, nano-filtration or ultra-filtration.

The first step is to determine the turbidity level in a water sample. Water tests can be conducted on site. When using a nephelometric turbidity meter:

1. Samples should be collected in a clean glass or polyethylene container.
2. Samples should be analyzed immediately after collection because the turbidity can change if the sample is stored.
3. The sample should be gently inverted a few times for mixing before reading the turbidity, taking care not to introduce air bubbles. Air bubbles in the sample will cause high turbidity readings. A vacuum purge from a syringe attached to a rubber stopper in the sample cell is the best way to remove air bubbles.
4. Dirty, scratched or chipped sample cuvettes can cause high readings. Sample cuvettes should be acid washed periodically and lightly oiled with silicon to mask imperfections in the glass. Badly scratched or chipped cuvettes should be discarded. Always index cuvettes so they can be oriented consistently in the turbidity meter chamber.
5. Excessive colour in the sample, which is more than 15 colour units, can cause low turbidity readings since colour will absorb light.
6. Any carbon in the sample will also cause low turbidity results, since carbon absorbs light.
7. Particles that cause turbidity are often electrically charged; therefore electric fields around motors may affect turbidity readings.
8. Vibrations will increase light scattering and result in high turbidity readings. The turbidity meter must be located on a bench with a solid footing.
9. After sample preparation and handling is completed, be sure to wipe all fingerprints from cuvette with a lint-free wipe before inserting into turbidity meter's chamber.
10. Turbidity standards have a shelf life. Formazin standards have very limited shelf life so discard after calibration. Even sealed standards supplied can change with time. Consult the manufacturer for replacement or calibration verification.