

Turbidity Measurement Guide

NONCOMMUNITY PUBLIC WATER SUPPLY UNIT

What methods can I use for turbidity measurement?

Turbidity measurements must be made using a meter that meets the specifications of EPA Method 180.1. Both handheld and online instruments may be used. A handheld meter that requires daily calibration should not be used.

Where should I measure turbidity?

Daily turbidity measurements should be taken from the final filter effluent tap. If there are multiple final filters running in parallel, a tap that represents the combined filter effluent should be used, or each of the filters should be monitored individually each day. Samples should be taken upstream of any storage or contact tanks. Measurements must be recorded on the monthly monitoring form that is submitted to MDH at the end of each month.

Systems serving greater than 500 people must measure Combined Filter Effluent (CFE) turbidity every 4 hours or on a continuous basis. Systems using conventional or direct filtration must continuously measure Individual Filter Effluent (IFE) turbidity unless they use two or less filters, in which case they must continuously measure CFE.

How can I ensure my measurements are accurate and reliable?

- Sample at a time when there is flow through the final filters (the plant is producing water) and flush the tap for at least 1 minute prior to sampling.
- Rinse the sample vial three times before taking the sample.
- Inspect the sample vial for scratches and chips. Replace if defects are found.
- Avoid touching the sides of the sample vial. Wipe the vial to remove fingerprints. Use a delicate task wipe intended for laboratory glassware. Paper towels can leave scratches on the sample vial which will affect measurement accuracy.
- If water is cold, warm the sample wrapped in a task wipe in your hand for a couple minutes to prevent condensation on the outside of the vial. Condensation will affect measurement accuracy and damage the internal components of the meter over time.
- Ensure the sample is free of bubbles prior to measuring.
- Press “read” several times until the result stabilizes.
- Rinse the sample vial after usage to prevent staining. Store dry.
- Calibrate the instrument according to the manufacturer’s recommended frequency.

What if my turbidity is higher than the required value?

If the turbidity is higher than the specified limit, action must be taken to ensure the filters are functioning properly. It is a violation of the Safe Drinking Water Act for more than 5% of the monthly turbidity measurements to exceed the specified limit.

To troubleshoot high turbidity measurements, use the table, **Troubleshooting High Turbidity Measurements** found on the following page.

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To obtain this information in a different format, call: 651-201-4700.

Troubleshooting High Turbidity Measurements

Cause	Indications	Solution
Stagnant water	The sample was taken without flushing the sample tap. The sample was taken while the system was not producing water.	Flush tap for at least 1 minute and ensure water is flowing through filter. Resample.
Dirty vial	There are smudges or fingerprints on the vial.	Wipe vial or replace
Bubbles	There are small bubbles in the sample vial.	Gently roll the vial until bubbles dissipate
Scratches on vial	There are small scratches on the vial surface. The vial has been dropped or wiped with a rough paper towel.	Replace vial
Condensation	The water is cold. Fog or condensation is visible on the outside of the sample vial.	Warm sample in hand and read again.
Filter breakthrough	The bag/cartridge filter is old. Turbidity has been steadily rising. There is a large pressure differential across the filter.	Replace filter
Ruptured filter	The bag/cartridge filter is old. The filter inlet and outlet turbidities are similar. The filter inlet and outlet pressures are similar.	Replace filter
Poor filter housing seal	The bag/cartridge filter was recently changed. The filter inlet and outlet turbidities are similar. The filter inlet and outlet pressures are similar.	Reinstall filter and ensure good seal
Membrane integrity	The membrane filter is old and fails a pressure integrity test. Turbidity does not improve upon backwash and chemical clean.	Replace filter
Meter out of calibration or dirty sensor	It has been a year or more since the last calibration. The meter reads >0.3 NTU with no vial inserted.	Calibrate meter or send to manufacturer for cleaning
High source water turbidity	The filter is in good condition and installed properly. Turbidity rose shortly after a weather event (rain, wind).	Install additional pretreatment Relocate intake structure