Turbidity QUICK GUIDE

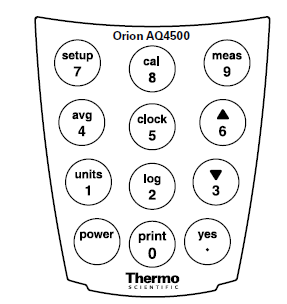
AQUAfast AQ4500 Turbidimeter

MassDEP Watershed Planning Program

CN 095.8 (updated 5/10/23)

Equipment needed: Turbidimeter, clean, unscratched vials(s), Kim-wipes, worksheet, disposable gloves, DI water.

Sample Holding Time: 48 hours from collection.



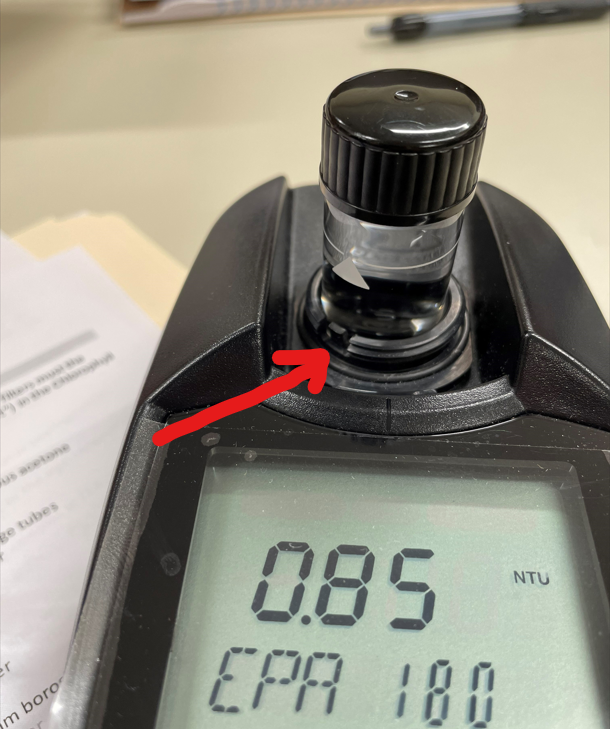
Measurement Range: 0-1000 NTUs (i.e., calibration range)

**SETUP:**

1. Retrieve samples and allow to come to room temperature; transfer sample custody by signing the Chain of Custody.
2. Record sample information the Turbidity printed worksheet (large binder): OWMID, lab numbers, date/time collected. Add lab numbers for a lab blank (LB) and lab duplicate (LD) and record the OWMID of the sample being used as a duplicate.
3. Set up the electronic workbook: Save a copy (“save as”) of the Color Turbidity Workbook Template from OneDrive ([WPP Lab SOPs and Results 2023](https://massgov-my.sharepoint.com/:f:/r/personal/james_meek_mass_gov/Documents/Monitoring/Targeted%20Monitoring%202023/WPP%20Lab%20SOPs%20and%20Results%202023?csf=1&web=1&e=CbQwXh)) with the new batch number as the file name. Check the Turbidity binder for the next batch number. Turbidity batch numbers are designated “TCyy-xx” with yy = year and xx = batch number. (E.g., TC23-01)
4. Turn on Turbidimeter and check battery condition. If low (<20%), replace batteries (4 AA batteries).
5. Check the measurement mode = EPA 180.1 (if not, change using SETUP key. See Field and Laboratory Operations Coordinator.)
6. Lab QC for each batch: Run lab blank (DI water) first, and one lab duplicate (select one of the field samples to run a second time) per batch or one per every ten samples for larger batches.

**MEASUREMENTS:**

1. Use gloves.NEVER TOUCH (OR SCRATCH!) THE VIALS WITH BARE HANDS! ALWAYS USE KIM WIPES.
2. Run the lab blank (DI water) first following Steps 9-14 (below). The blank should be ≤ 0.02 NTU. If the blank is > 0.02 NTU, check that the vial is clean (or switch vials), and retest before continuing measurements for the regular samples. If the problem persists, talk with the Field and Laboratory Operations Coordinator.



1. **Rinse** the turbidity vial: 2 rinses DI water and one rinse with the sample.
2. **Mix** the field sample gently but thoroughly to disperse the solids immediately before pouring.
3. **Pour** the sample into the vial up to the fill-line and recap. Wait until all bubble disappear.
4. **Wipe** the vial clean with Kimwipes. Place the vial in the measurement sample chamber, lining the triangle on the vial with the notch (red arrow in picture). And cover the sample well with the well cap.
5. **Take the reading**: press the “avg” (4) key to activate the averaging feature, press “meas” (9) to take the measurement. (Averaging will stay active until you press the “avg” key again.)
6. **Record** the reading on the worksheet.
7. Repeat Steps 8-13 to analyse all samples.
8. After last sample, review lab sheet to ensure that all sample and analysis information has been recorded.
9. When done, turn unit off and clean up work area.
10. Enter raw results and related information into the electronic Turbidity worksheet. The e-lab sheet will automatically incorporate any dilution factors and will apply rounding rules and significant figures for the final result.
11. Once the final values are calculated, transfer final e-results back to the paper raw lab sheet. Save the manual lab sheet (bench sheet) in the lab binder for turbidity.

Reminders:

1. Keep vial cover in place at all times to prevent water/dust from contaminating optical well.
2. When aliquoting samples into measurement vial, always shake/swirl sample thoroughly in original bottle to ensure complete mixing of the sample prior to pouring sub-sample into vial.
3. When reading samples, always align white triangle with tab.
4. Keep vials CLEAN and UNSCRATCHED. Wash with soft cloth and detergent periodically.
5. Follow minimum rinse protocols at all times: 2/1/1
   1. Rinse with DIW (2X)
   2. Rinse with standard/sample (cap and swirl vial) (1X)
   3. Pour standard/sample into vial (1X)

Calibration Check: MONTHLY/QUARTERLY (See Field and Laboratory Operations Coordinator)

1. Insert the CAL 1 standard (DI water blank) into sample chamber and put the cover on.
2. Select the measurement mode.
3. Press the MEAS (#9 key). Wait 5-10 seconds for internally-averaged result.
4. The meter will display the results. Record the reading.
5. Repeat the calibration check for CAL 2, CAL 3, CAL 4 and CAL 5 calibration standards.
6. If the displayed results are within 10% of the nominal NTU value of the standard or the precision criteria required by your method, the calibration check passed and the meter is now ready for measurement.

Calibrate: EVERY SIX MONTHS AND/OR AS NEEDED (Refer to SOP: CN 95.2 SOP Analysis for Turbidity for directions).

Reference Methods: 1) Standard Methods 2130 B, EPA 180.1; 2) AQ4500 Operating Manual