Required Quality Control Measurements for Common Water Quality Parameters Conducted by ODEQ Volunteer Monitoring Program Participants

PARAMETER	ACCURACY (1) When (2) How (3) Data Quality Levels	PRECISION (1) When (2) How (3) Data Quality Levels
Continuous Temperature	(1) Before and after each field season (2) Warm and cold water baths as described in OWEB guidebook (3) A level is difference from master thermometer of <= 0.5 degrees C	(1) At deployment and retrieval as an absolute minimum. (2) Field audits with NIST traceable digital thermometer (3) A level is difference from field audit of <= 1.5 degrees C when recording at half hour intervals
Grab Temperature	(1) Annually (2) 5 temperature water baths (3) Acceptable level is difference from master thermometer of <= 0.5 degrees C	(1) Every day or at 10% of sampling sites, whichever is greater[1] (2) Duplicate samples, in stream measurements are done sequentially (3) A level difference between duplicates of <= 0.5 degrees C
Specific Conductivity	(1) Bracketing your sample results, preferably at the start and end of each day (2) Tests against secondary standard in the ranges of 1400 and/or 140 micro Siemans/cm (3) A level is difference from standard of <= 7% of standard value	(1) Every day or at 10% of sampling sites, whichever is greater[1] (2) Duplicate samples, in stream measurements are done sequentially (3) A level is relative percent difference[1] <= 10%
pH	(1) Bracketing each day's samples at a minimum. (2) Tests against 7 and 10 buffers, recalibrate if off by 0.1 from buffer (3) A level is difference from buffer of <= 0.2	(1) Every day or at 10% of sampling sites, whichever is greater[1] (2) Duplicate samples (3) A level is difference between duplicates of <= 0.3
Dissolved Oxygen	(1) Difficult, maybe once or twice a year (2) Side by side testing with DEQ, or blind samples sent to test titrations (3) A level is difference from DEQ of <= 0.3 or for blind titration <= 0.2	(1) Every day or at 10% of sampling sites, whichever is greater[1] (2) Duplicate samples (3) A level difference between duplicates of <= 0.3
Turbidity	(1) Before and after each sampling day (2) Tests against all three Gelex secondary standards. Secondary standards are certified and relabeled every 3 months with primary standards in the lab (3) A level is difference from standard of <= 5% of standard	(1) Every day or at 10% of sampling sites, whichever is greater[1] (2) Duplicate samples (3) A level is relative percent difference between duplicates is <= 5%
E. coli[2]	(1) Upon receipt of reagents at DEQ (done by DEQ staff).[2] (2) Estimates can be done by doing side by side samples with DEQ (3) A level is difference of the logs of the side by side samples <= 0.6 log units	(1) Every day or at 10% of sampling sites, whichever is greater[1] (2) Duplicate samples (3) A level is a difference between the logs of the values <= 0.6.

1. Under monitoring programs where volunteers only collect 1 -2 stations per sampling event, each volunteer should have duplicates for ≥ 10% of the samples they collect over the season plus a duplicate for all parameters on the first day of each monitoring season.
2. Quality control checks on dilution and blank water should be run using spikes comparable to Quanti-Cult® to test for promotion or inhibition of *E. coli* growth. If sampling conditions require use of a secondary sampling container frequent blanks should be conducted at targeted locations most likely to be contaminated to assess possible serial contamination. These tests are completed by the sampling/analytical organization.

All of the supplies required for these tests, excluding distilled water, are distributed as part of the ODEQ Volunteer Monitoring Program. See http://www.deq.state.or.us/lab/wqm/docs/DataEvaluation.pdf for more information and examples of how to determine Data Quality levels.