DEPARTMENT OF ECOLOGY
State of Washington

Standard Operating Procedure WQP005, Version 1.0

Calibration of Meter for pH, ORP, Optical DO, Conductivity, and Turbidity

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Purpose of this document

The Washington State Department of Ecology develops Standard Operating Procedures (SOPs) to document agency practices related to sampling, field, and laboratory analysis, and other aspects of the agency's technical operations.

Publication information

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Washington State Department of Ecology
Environmental Assessment Program

Standard Operating Procedure for the Calibration of Meter for pH, ORP, Optical DO, Conductivity, and Turbidity, WQP005, Version 1.0

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SIGNATURES ARE AVAILABLE UPON REQUEST

The Washington State Department of Ecology's (Ecology's) Standard Operating Procedures (SOPs) are adapted from published methods or developed by in-house technical and administrative experts. Their primary purpose is for internal Ecology use, although sampling and administrative SOPs may have a wider utility. Our SOPs do not supplant official published methods. Distribution of these SOPs does not constitute an endorsement of a particular procedure or method.

Any reference to specific equipment, manufacturer, or supplies is for descriptive purposes only and does not constitute an endorsement of a particular product or service by the author or by Ecology.

Although Ecology follows the SOP in most instances, Ecology may use an alternative methodology, procedure, or process in some instances.

SOP Revision History

The Water Quality Program Quality Assurance Coordinator must recertify this SOP every 5 years.

Revision date	Revision number	Summary of changes	Sections	Reviser(s)
7/31/2025	1.0	Editorial; formatting	All	Eli Newby, Lucy Cornejo, Eric Daiber

1.0 Purpose and Scope

1.1 This document is the Water Quality Program's (WQP) Standard Operating Procedure (SOP) for the calibration of a meter capable of measuring pH, and/or oxidation-reduction potential, dissolved oxygen, specific conductivity, and turbidity.

1.2 The SOP covers meter calibration, sample collection, sample measurements, and quality assurance/quality control procedures to ensure the data collected is of high confidence. This SOP is not a substitute for the manufacturer's meters' user manual; calibration, maintenance, and storage recommendations; or mandatory training by the manufacturer.

1.3 This SOP does not substitute for project-specific quality assurance documents.

2.0 Applicability

2.1 This SOP is intended to support permit inspection staff with the calibration of a (multi)parameter field meter.

2.2 This SOP may be used with groundwaters, surface waters, stormwaters, treated/untreated process waters, and similar water types.

3.0 Definitions

3.1 Ecology – Washington State Department of Ecology

3.2 WQP – Water Quality Program

3.3 EAP – Environmental Assessment Program

3.4 Field logbook – A weather resistant logbook containing "Rite in the Rain"® paper used to document any and all field activities, sample data, methods, and observations for every sample sites.

3.5 MQOs – Measurement Quality Objectives

3.6 SDS – Safety Data Sheets (SDS) provide both workers and emergency personnel with the proper procedures for handling or working with a particular substance. SDSs include information such as physical data (e.g., melting point, boiling point, flash point), toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill/leak procedures.

3.7 pH – A measure of the acidity or alkalinity of a solution, numerically equal to 7 for neutral solutions, increasing with increasing alkalinity and decreasing with increasing acidity. The pH scale generally ranges from 0 to 14 (standard units [SU]).

3.8 Oxidation-Reduction Potential (ORP) – A measure of the tendency of a chemical species to acquire electrons and thereby be reduced. Each species has its own intrinsic reduction potential; the more positive the potential, the greater the species affinity for electrons and tendency to be reduced (mV).

3.9 Multiparameter — the combination of several sensors or sensor assemblies into a complete, stand-alone piece of equipment, which simultaneously measures multiple parameters for profiling, spot-checking, or logging readings and data.

3.10 Electrical conductivity – A measure of a materials ability to conduct an electrical current. In water, conductivity is related to the concentration and charge of dissolved ions (siemens).

3.11 Dissolved Oxygen (DO) – A measure of the amount of oxygen dissolved in water using an optical sensor (%, mg/L).

3.12 Turbidity – A measure of the clarity of water as expressed by nephelometric turbidity units (NTU) and measured with a calibrated turbidimeter.

4.0 Personnel Qualifications/Responsibilities

4.1 It is highly recommended that field operations staff receive First Aid/CPR Training and field staff are required to have Defensive Driving training.

4.2 Boat operations require that staff meet specific training requirements as described in Environmental Assessment Program's (EAP) Field Safety Manual, such as an EAP Boating Course and an approved Boating Safety Course.

4.3 Because the procedure requires the use of hazardous materials, training is required as per the Ecology Chemical Hygiene Plan (Ecology, 2022), which includes Laboratory Safety Orientation, Job-Specific Orientation and Chemical Safety Procedures. The Standard Operating Procedures in Section 16 of the Chemical Hygiene Plan for handling chemicals must also be followed.

5.0 Equipment, Reagents, and Supplies

5.1 Extension pole with a bottle clamp

5.2 Field logbook or field data report form (See Attachment A for example form)

5.3 Tap and/or deionized (DI) water

5.4 Sensors

5.4.1 A pH electrode (capable of at least a two-point calibration)

5.4.2 An electrical conductivity probe

5.4.3 An ORP sensor

5.4.4 An optical DO sensor

5.4.5 A turbidity sensor

5.5 Calibration solutions [*Note: Wear gloves – these buffers may be considered a health hazard. Keep calibration solutions at room temperature (20-25^{o}C).*]

5.5.1 Calibration turbidity standards that bracket the expected range of field measurements

5.5.2 Calibration electrical conductivity solution bracketing the expected range of field measurements

5.5.3 Calibration ORP solution prepared for calibration

5.5.4 Calibration pH buffers that bracket the expected range of field measurement

5.5.5 Ensure all calibration solutions are not expired and mark all calibration solution bottles with the date of their opening and initials of the user.

5.6 Validation solutions for required verification of calibration of select parameters

5.7 Dedicated pH buffer calibration bottles (125 mL clear bottles) or pouches

5.9 pH storage solution (storage solution for pH probe is pH 4 buffer) [*Caution: Wear gloves, these solutions may cause eye irritation.*]

5.10 Squirt bottle

5.11 Meter Calibration Log Form (See Attachment B or C for example forms)

5.12 Toolbox containing:

- Spare parts: O-rings, screws, calibration cups, etc.
- Kimwipes
- Cotton swabs
- Silicone grease
- Spare gloves
- pH reference electrolyte solution
- Phillips and flathead screwdrivers
- Toothbrush
- Pliers
- Crescent wrench
- Tweezers
- Electrical tape
- Batteries (if necessary)
- Allen wrenches

5.13 Optional: YSI ProDSS (digital sampling system) multiparameter digital water quality meter with applicable sensors installed following manufacturer's instructions

6.0 Summary of Procedure

6.1 Meter Calibration

- Store the meter, electrode, buffers, and filled DI squirt bottle overnight in a heat-controlled room that is kept between 15-30 °C (59-86°F). All pH electrode, ORP, and EC calibrations must be done using buffers that are above 15°C but not warmer than 30°C.
- Keep the pH electrode in a moist environment for short-term storage. Empty and refill the pH electrode storage container with dedicated pH storage solution or pH 4 buffer for long term storage of the pH electrode.
- Refer to device manual for manufacturer instructions for meter calibration.

6.1.1 pH electrode calibrations

6.1.1.1 Follow the manufacturer instructions for the calibration of the pH electrode.

6.1.1.2 The pH electrode calibration should be verified each day the instrument is used, although a new, clean pH electrode may be stable for several days or weeks.

6.1.1.3 Rinse the pH electrode with DI water (or tap if DI unavailable), ensure the pH electrode is clean[1] of debris before preforming a pH calibration.

6.1.1.4 Other pH meter calibration (not YSI ProDSS)

6.1.1.4.1 The pH 7 buffer should be used regardless of how many calibration points you use, although it does not necessarily have to be the first point.

6.1.1.4.2 Pre-rinse pH electrode, sensor guard, and calibration solution cup with a small amount of pH buffer solution prior to use in calibration.

6.1.1.4.3 Fill the cup with buffer solution so the pH electrode tip and the temperature sensor are submerged in the buffer solution. Buffers used for a two-point calibration must bracket the expected range of the field measurement results (e.g., 4 and 7 or 7 and 10).

6.1.1.4.4 Record the pH electrode calibration information on the calibration sheet or field log.

6.1.1.5 YSI ProDSS pH calibrations

6.1.1.5.1 Calibrate electrode following the meter instruction manual for a two- or three-point calibration.

6.1.1.5.2 One should use the pH 7 buffer regardless of how many calibration points you use, although it does not have to be the first point.

6.1.1.5.3 Pre-rinse pH electrode, sensor guard, and calibration cup with a small amount of pH buffer solution prior to use in calibration. *Note: Invert the pH electrode, sensor guard, and calibration at least three times with the small amount of pH buffer solution to ensure the sensors have been rinsed.*

6.1.1.5.4 Fill the cup with buffer solution so the pH electrode tip and the temperature sensor are submerged in the buffer solution. Buffers used for a two-point calibration must bracket the expected range of the field measurement results (e.g., 4 and 7 or 7 and 10).

6.1.1.5.5 The YSI ProDSS should automatically recognize the pH buffer solutions 4, 7, and 10. Although, if the value provided for the pH buffer solution is incorrect manually

[1] Cleaning is required whenever deposits or contaminants appear on the glass and/or platinum surfaces or when the sensor's response slows. The cleaning can be chemical and/or mechanical. Removing the sensor from the cable may make cleaning easier. Initially, moisten a soft clean cloth, lens cleaning tissue or cotton swab to remove all foreign material from the glass bulb and/ or platinum button. Then use a moistened cotton swab to carefully remove any material that may be blocking the reference electrode junction of the sensor. Read manufacturer's instructions.

enter the pH buffer solution value.

6.1.1.5.6 Acceptable pH millivolts for each calibration point should be recorded and within the mV ranges below:

6.1.1.5.6.1 pH 7: mV value = 0 mV ± 50 mV

6.1.1.5.6.2 pH 4: mV value = +165 to +180 mV from pH 7 buffer mV value

6.1.1.5.6.3 pH 10: mV value = -165 to -180 mV from pH 7 buffer mV value

6.1.1.5.7 Wait for the measurement to stabilize in each buffer both electrochemically and temperature before accepting the calibration measurement. Press *Enter* to accept the calibration point.

6.1.1.5.8 Record the calibration information on the calibration sheet. Then reattach the pH electrode storage bottle/cup or sleeve.

6.1.1.5.9 For a three-point calibration of the pH electrode follow the meter instruction manual for a three-point calibration.

6.1.1.5.10 Verify the calibration accuracy by checking that the pH 7 buffer is off by less than 0.1 SU.

6.1.1.5.11 Navigate to the GLP file and check the pH slope and slope % of ideal. A good slope should be between 55 and 60 mV's, while the ideal is 59 mV.
If the slope drops below 53 mV, clean the sensor and attempt calibration again.

6.1.1.5.12 Reattach the pH electrode storage bottle/cup or sleeve.

6.1.1.5.13 Record the pH electrode calibration information on the calibration sheet or field log.

6.1.1.6 Ensure the pH electrode is calibrated within the quality control criterion listed in the pre-sampling, post-calibration Section 6.6: Quality Control Criteria.

6.1.2 Electrical conductivity calibrations

6.1.2.1 Follow the manufacturer instructions for the calibration of the conductivity sensors. Verify the conductivity calibration every day the instrument is used. The conductivity sensor is generally very stable and may hold its calibration for several weeks. *Note: Specific conductance is temperature compensated electrical conductivity and should be calibrated for the greatest ease and accuracy.*

6.1.2.2 YSI ProDSS conductivity calibrations

6.1.2.2.1 Rinse the conductivity sensor with DI water (or tap if DI unavailable), ensure the conductivity sensor is clean of debris using a Kimwipe and dry before performing a specific conductance calibration.

6.1.2.2.2 Pre-rinse the conductivity sensor, sensor guard, and calibration cup with a small amount of conductivity calibration solution.

6.1.2.2.3 Fill the YSI ProDSS calibration cup to line 2 (i.e. the top line). **The calibration solution must cover the top vent holes of the conductivity sensor. If the entire sensor is not**

submerged in solution, the instrument will read approximately half the expected value.

6.1.2.2.4 After placing the conductivity sensor into the solution, gently move the sensor to ensure no air bubbles are trapped in the conductivity sensor.

6.1.2.2.5 Calibrate the conductivity sensor using a single-point calibration (e.g., 1,413 uS/cm, 12,880 uS/cm) in the expected range of the field measurement results.

6.1.2.2.6 Wait until there is no significant change for 40 seconds, then record the conductivity calibration information on the calibration sheet.

6.1.2.2.7 Post-calibration, navigate to the GLP file and check the conductivity cell constant for the conductivity calibration. The cell constant should be 5 to 6 for highest accuracy, but 4.5 to 6.5 is acceptable.

6.1.2.2.8 Calibrate the conductivity using two- or three-point calibration following the manufacturer's instructions.

6.1.2.2.9 Record the conductivity sensor calibration information for the two- or three-point calibration on the calibration sheet.

6.1.2.3 Ensure the conductivity sensor is calibrated within the quality control criterion listed in the pre-sampling, post-calibration Section 6.5: Quality Control Criteria.

6.1.2.4 Store the conductivity sensor in a moist environment.

6.1.3 Optical dissolved oxygen calibration

6.1.3.1 Follow the manufacturer instructions for the calibration of the optical dissolved oxygen (DO) calibration.

6.1.3.2 *Note: Salinity affects the water's ability to hold oxygen. Calibration of the conductivity sensor is recommended prior to the optical DO sensor calibration to obtain accurate DO readings.*

6.1.3.3 YSI ProDSS dissolved oxygen calibrations

6.1.3.3.1 Make sure the optical DO sensor cap installed on the optical DO sensor is not scratched or excessively dirty.

6.1.3.3.2 Ensure the meter's barometer is reading accurately, check the barometric pressure using a weather service. If the barometer is not reading accurately, then the DO calibration may be erroneous. *Note: The meter's barometer may not match the weather service's barometric pressure exactly.*

6.1.3.3.3 Ensure the optical DO sensor and sensor bulkhead are dry using Kimwipes.

6.1.3.3.4 Place a small amount of water in the storage cup for the optical DO sensor and place the storage cup over the optical DO sensor.

6.1.3.3.5 Ensure the optical DO sensor is in the air, not water, and there are no water droplets on the sensor cap or temperature sensor.

6.1.3.3.6 ***Do not*** allow the optical DO sensor to come into contact with the water in the

calibration cup.

6.1.3.3.7 Partially tighten the locking ring on calibration cup to the sensor bulkhead, to ensure air exchange between the inside and outside of the calibration cup.

6.1.3.3.8 Wait for approximately 5 to 10 minutes for the storage container to become completely saturated.

6.1.3.3.9 Record the optical DO sensor calibration information on the calibration sheet.

6.1.3.4 Ensure the optical DO sensor is calibrated within the quality control criterion listed in the pre-sampling, post-calibration Section 6.6: Quality Control Criteria.

6.1.4 Oxidation-reduction potential calibrations

6.1.4.1 Follow the manufacturer instructions for the calibration of the oxidation-reduction potential (ORP) sensor.

6.1.4.2 YSI ProDSS ORP calibration

6.1.4.2.1 The ORP sensor may be capable of maintaining calibration for several days. If using a combination sensor, calibrate pH prior to ORP calibration to ensure the pH/ORP sensor is working properly.

6.1.4.2.2 Rinse the ORP sensor with DI water (or tap if DI unavailable), ensure the ORP sensor is clean of debris and dry before performing ORP calibration.

6.1.4.2.3 Pre-rinse the sensor, sensor guard, and calibration cup with a small amount of ORP calibration solution.

6.1.4.2.4 Fill the cup so the ORP sensor tip and temperature are submerged in ORP solution.

6.1.4.2.5 If using YSI Zobell ORP calibration solution, the ProDSS will adjust the calibration value based on the temperature. Otherwise, manually adjust the calibration value.

6.1.4.2.6 Wait for the ORP readings to stabilize and press *enter* to accept the calibration.

6.1.4.2.7 Record the ORP sensor calibration information on the calibration sheet.

6.1.4.3 Ensure the ORP sensor is calibrated within the quality control criterion listed in the pre-sampling, post-calibration Section 6.6: Quality Control Criteria.

6.1.5 Turbidity calibrations

6.1.5.1 Follow the manufacturer instructions for the calibration of the turbidity sensor.

6.1.5.2 YSI ProDSS turbidity calibrations

6.1.5.2.1 The turbidity sensor should be verified every day the instrument is used, although the turbidity sensor is very stable and may hold its calibration for several weeks. *Note: Use the same brand and type of standard for all turbidity calibration points.*

6.1.5.2.2 Ensure the calibration cup and sensor guard are attached to the bulkhead when calibrating turbidity. *Note: The sensor guard must be installed when taking measurements.*

6.1.5.2.3 Sensor guard has a metal bottom, painted black. Ensure the inside surface (i.e., the

surface that faces the turbidity sensor) is not significantly scratched. The surface must be black to eliminate stray light reflection that may affect the turbidity sensor.

6.1.5.2.4 Ensure the turbidity sensor and sensor guard is clean of debris with a Kimwipe, dry, and free of reflective material before performing turbidity calibration.

6.1.5.2.5 The ProDSS turbidity sensor is either calibrated using a two- or three-point calibration using the following ranges of turbidity solutions.

6.1.5.2.5.1 1st calibration point: 0-1 NTU; deionized water[2] can be used for the first calibration point (i.e., 0-1 NTU).

6.1.5.2.5.2 Ensure turbidity calibration solutions are thoroughly shaken and not expired prior to use.

6.1.5.2.5.3 2nd calibration point: 5-200 NTU

6.1.5.2.5.4 3rd calibration point: 400-4,200 NTU

6.1.5.2.6 Pre-rinse the turbidity sensor, sensor guard, and calibration cup with a small amount of the first turbidity calibration solution.

6.1.5.2.7 Pour the first calibration standard slowly down the side of the calibration cup so as to not aerate the sample. This reduces the possibility of air bubbles becoming trapped on the surface of the sensor.

6.1.5.2.8 Slowly place the turbidity sensor into the calibration cup while the calibration cup is tilted at a minimum of a 45-degree angle to prevent bubbles on the sensor surface.

6.1.5.2.9 Wait for the turbidity measurement to stabilize and press *accept* for each turbidity calibration standard.

6.1.5.2.10 Rinse the sensor and calibration cup with a small amount of next turbidity standard between the calibration points.

6.1.5.2.11 If calibrating the turbidity sensor with 1 or 2 points, select *Finish Calibration* following calibration acceptance. Otherwise, the YSI ProDSS turbidity calibration terminates at a 3-point calibration.

6.1.5.2.12 If the calibration is questionable, do not accept calibration. Typical causes of this error message include a dirty sensor or bad standard solution. Return to 6.1.5.1 to repeat the process.

6.1.5.3 Ensure the turbidity sensor is calibrated within the quality control criterion listed in the pre-sampling, post-calibration section 6.6: Quality Control Criteria.

6.2 Sample Collection

6.2.1 Follow the standard operating procedure, WQP001: Collecting Grab Samples from Stormwater Discharges. This SOP outlines how to manually obtain a representative grab sample from a variety of stormwater conveyance systems.

6.2.2 Refer to Ecology, (2015), Stormwater Sampling Manual: A guide for the Industrial

[2] If DI water is unavailable, then use potable tap water.

Stormwater General Permit, for guidance on how operators of permitted facilities need to sample, gather, and report data in order to describe the quality of stormwater leaving the facility.

6.2.3 Refer to EAP015: Manually Obtaining Surface Water Samples for how to collect samples from lotic and lentic waterbodies, wastewater treatment plant access points, and outfalls, pipes, and drains. It also describes procedures for sampling while wading on beaches and from boats and bridges. This SOP does not describe the operation of unattended automated sampling devices, nor does it cover pelagic marine or groundwater sampling.

6.3 Sample Measurement Procedure

6.3.1 The sample measurement procedures outlined in this section are intended to be a supplemental procedure to the project-specific quality assurance documents and are not intended to be a standalone procedure.

6.3.2 *Note: It may take several minutes to obtain a repeatable and stable measurement from a grab sample. Wait until the measurements are stable to record the measurement. Avoid significant sample temperature changes by keeping the collected sample in the shade or closing the vehicle doors and turning on the air conditioner or heater. Sample water quality parameters may change with temperature.*

6.3.3 Thoroughly rinse the bulkhead, sensors, sensor guard, and sample cup, with deionized or sample water.

6.3.4 Other meter sample collection

6.3.4.1 Follow manufacturer instructions on how to collect a sample for the meter.

6.3.5 YSI ProDSS sample collection

6.3.5.1 Fill the YSI ProDSS sample cup to line 2 (i.e. top line with the cup is upright). If limited water is available, fill the YSI ProDSS sample cup to line 1 (i.e., the bottom line when the cup is upright) and ensure the sensors of interest are submerged. The sample must completely cover the top vent holes of the conductivity sensor, if attached. *Note: Excessive agitation of the sample water will affect the optical dissolved oxygen, turbidity, conductivity, and pH.*

6.3.5.2 Insert the YSI ProDSS bulkhead with applicable, calibrated sensors into the sample, turn on the meter.

6.3.5.3 Go back to the home screen on the YSI ProDSS and wait until a stable result[3] is indicated.

6.3.5.4 Gently stir and re-measure the sample until obtaining consecutive stable readings within predetermined quality assurance criteria.

6.3.6 Record the results on the field data report form or field logbook.

6.3.6.1 If the pH result equals 6.5 or less or 8.5 or higher, then check calibration of the pH

[3] The stable result is dependent on project-specific quality assurance documentation.

meter using the closest buffer (e.g., 7 or 10). Record the calibration check result in the field data report form of the field logbook.

6.4 End of Day or Run Procedures

6.4.1 After sample collection, rinse sensors with DI, if available, or tap water then pour a small amount (<10 mL) of pH 4 buffer solution into the calibration cup for short term storage of the pH electrode. This will prevent the pH electrode from drying.

6.4.2 Store the meter, electrode (tip down), calibration buffers, and a filled DI water squirt bottle in a heated room (hotel room, office, regional lab, or operation center). One may store the solutions in a vehicle if the temperature ranges is between 59 and 86°F.

6.4.3 If long-term storage of the pH electrode is expected, carefully re-attach the half-filled electrode soaker bottle filled with either pH storage solution or pH 4 buffer solution.

7.0 Quality Control Criteria

7.1 Table 1 shows the pre-sampling and post-sampling, post-calibration acceptance quality control criteria by parameter.

7.2 The pre-sampling, post-calibration acceptance criteria are intended for use prior to sample collection, but after instrument calibration.

7.2.1 If the resulting calibration acceptance quality control criteria are greater than the those provided in the pre-sampling, post-calibration column of Table 1, then clean the sensor and attempt recalibration.

7.3 The post-sampling, post-calibration column contains quality control criteria for the assessment of the instrument after sampling.

7.3.1 After sampling, the post-sampling calibration check must be performed within the range of the samples collected.

7.3.2 If the resulting post-sampling calibration check does not meet the “Pass” qualification criteria, then the resulting data collected during that day must be qualified with either a “J” for estimate or “R” for reject.

7.4 As additional quality control checks when using the YSI ProDSS instrument it may be important to log the following information from the GLP file.

7.4.1 Post-calibration, navigate to the GLP file and check the pH slope and slope % of ideal. A good slope should be between 55 and 60 mV’s, while the ideal is 59 mV. If the slope drops below 53 mV, clean the sensor with DI water and Kimwipe and attempt calibration again.

7.4.2 Post-calibration, navigate to the GLP file and check the conductivity cell constant for the conductivity calibration. The cell constant should be 5 to 6 for highest accuracy, but 4.5 to 6.5 is acceptable.

Table 1: Pre- and post-sampling calibration acceptance quality control criteria by parameter.

Pre- and Post-Sampling Calibration Acceptance Criteria by Parameter		
Parameter	**Pre-sampling, Post-calibration**	**Post-sampling, Post-calibration**
pH	Less than or equal to ±0.1, Pass	Less than or equal to ±0.15, Pass
	Greater than ±0.1, Recalibrate	Greater than ±0.15 and less than or equal to ±0.5, "J" Qualify
		Greater than ±0.5, "Reject" Qualify
Conductivity	Less than or equal to ±2%, Pass	Less than or equal to ±5%, Pass
	Greater than ±2%, Recalibrate	Greater than ±5% and less than or equal to ±10%, "J" Qualify
		Greater than ±10%, "Reject" Qualify
DO	N/A	N/A
ORP	Less than or equal to ±2%, Pass	Less than or equal to ±5%, Pass
	Greater than ±2%, Recalibrate	Greater than ±5% and less than or equal to ±10%, "J" Qualify
		Greater than ±10%, "Reject" Qualify
Turbidity	Less than or equal to ±5%, Pass	Less than or equal to ±10%, Pass
	Greater than ±5%, Recalibrate	Greater than ±10% and less than or equal to ±15%, "J" Qualify
		Greater than ±15%, "Reject" Qualify

8.0 Records Management

8.1 All hardcopy documentation of the data, such as completed Field Logbook and Field Data Report Forms, are kept and maintained by the project lead. These documents are typically organized in binders or in expanding files. After about six years, hardcopies are boxed and moved to Water Quality Program archives.

9.0 Quality Control and Quality Assurance Section

9.1 The data QA program for field sampling consists of three parts:
(1) adherence to the SOP procedures for sample/data collection and periodic evaluation of sampling personnel,
(2) consistent instrument calibration, methods, and schedules, and
(3) the collection of a field quality control (QC) sample(s) during each sampling run.

9.2 Further data quality control and quality assurance procedures will be addressed thoroughly in each study's Quality Assurance Project Plan.

10.0 Safety

10.1 Safety is the primary concern when collecting samples. Since most sample sites are

located on permitted facilities, conditions (i.e., weather, roads, site) should always be checked before departure.

10.2 If roadside hazards, weather, accidents, construction, etc. make sample collection dangerous, then skip that facility, then note the reason on the formal data report form and notify your supervisor of the hazard when you return to the office.

10.3 If the hazard is a permanent condition, relocation or ceasing activity at that facility may be necessary. Review Ecology's Safety Program Manual (Ecology, 2017) periodically to assist with these safety determinations.

10.4 Waste disposal: Rinse the used calibration buffer solutions may be discharged down the drain with water to reduce any impact on the wastewater treatment system.

11.0 References

11.1 Ecology, 2017. Water Quality Program Safety Manual. Olympia, WA.

11.2 Ecology, 2022. Chemical Hygiene Plan. Olympia, WA.

12.0 Attachments

12.1 Attachment A: Field Sampling Report

12.2 Attachment B: Water Quality Program Field Calibration Form pH

12.3 Attachment C: Water Quality Program Field Calibration Form