DEPARTMENT OF ECOLOGY State of Washington — EIM Environmental Information Management

EIM Help – Field Measurements

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This guidance addresses common questions about how to enter field measurement data into EIM.

Measurement Definition

Measurements are data collected in the field using an instrument; they **are always in-situ**. Designate measurements in EIM with Field Collection Type "Measurement" (column D in the Result template or Well Water-Level template and column E in the Time-Series Result template).

Note: If you removed environmental media from the field and sent it to a laboratory for analysis, EIM considers this a sample, not a measurement. **If you removed environmental media and analyzed it in a mobile lab, vehicle, or other ex-situ location at the site, EIM also considers this a sample**. Designate samples in EIM with Field Collection Type "Sample" (column D in the Result template).

Grouping Related Samples and Measurements in EIM

If you took samples related to your measurements at your sampling location, they will already share the same Location ID and Field Collection Date in EIM. Another way to relate the measurements and samples in EIM is to assign them both the same Sample ID. EIM requires Sample ID (column R in the Result template) for samples, but it is optional for measurements. Assigning the same Sample ID to measurements and related samples helps users identify that they are related. This approach is optional; you can choose it if you intentionally synchronized your measurements and samples to capture the same ambient conditions. However, this approach may not make sense if measurement and sample times were not designed to occur concurrently or to represent the same ambient conditions.

Result Methods for Measurements

There are three main types of result methods you can choose from for measurements: (1) generic methods, (2) technology-based methods, and (3) published methods.

We don't put methods in EIM that are based on instrument manufacturer and model because we'd have to document and manage hundreds of different instruments.

Many instruments also have multiple sensors that each use a separate method.

If you wish to document instrument-specific information like manufacturer and model, put it in one of the template comment fields. We are considering adding a future field to EIM for instrument-specific information.

Generic methods

Generic methods give basic information about what the instrument measures. They don't provide information about the underlying technology. Use generic methods when there isn't an appropriate technology-based method or published method. An example is "PH-METER."

Technology-based methods

In EIM, we use technology-based field methods instead of instrument manufacturer model-specific methods. For example, "DO-OPTICAL" is the method code for any optical dissolved oxygen meter that measures luminescent dissolved oxygen. The code doesn't contain information about the manufacturer or model, only the technology used in the instrument. See the manufacturer's tech sheet to determine the technology used by your instrument.

See "Important Note About Published Methods" below.

Published methods

Published methods are from authoritative sources and outline the specific steps, tools, and materials required to perform a laboratory analysis or field measurement. There are several recognized sources of published methods including Standard Methods for the Examination of Water and Wastewater and the U.S. EPA. The National Environmental Methods Index (NEMI) catalogs published methods from many sources, although it's not a complete library.

Examples of published methods are “SM4500-OG” (Dissolved Oxygen by Membrane-Electrode Method) and “EPA170.1” (Temperature (Thermometric)). EIM indicates the source of published methods in the method code and reference. For more information on the EIM method coding scheme, see About EIM Methods.

Important note about published methods

Manufacturers sometimes indicate that an instrument is “compliant” with a published method, but this doesn’t mean that you can cite that method simply because you used the instrument. Manufacturers do this because they built the instrument to provide results within tolerances specified in the method. The methods themselves often contain additional QA checks, specific techniques, and procedures.

Read the method’s documentation to determine what steps are involved. **If you DIDN’T PRECISELY FOLLOW the published method,** use a generic or technology-based method instead.

An example is “EPA180.1” (Determination of Turbidity by Nephelometry). While an instrument’s tech sheet might say that it’s compliant with the EPA180.1, you need to read the method details. For example, the quality control section lists specific requirements for Quality Control Samples (QCS), Laboratory Reagent Blanks (LRB), and instrument Performance Check Solutions (IPC). If you didn’t follow those, you can’t use the method for your data.

Additionally, the QAPP should specify a particular published method if it’s used for a study.

Revisions to published methods

When a method provider publishes a revision (new version) of a method you’ve been using, you can’t automatically cite it. Always check the revision details for changes. Make sure you follow any changes. Do this before citing the method revision in your EIM data submittal.

Multi-Parameter Meters

Sometimes field meters contain multiple sensors, such as a multi-parameter sonde. You need to use the representative result method for each sensor on the instrument.

Common Result Methods for Measurements

Below are examples of common result methods for the measurement of dissolved oxygen, conductivity, pH, temperature, and turbidity. If you don't see a method here, you can search for more result methods online. If you can't find the method you need, contact us online or ask your data coordinator.

Dissolved oxygen method examples

Also see the section below about DO vs. DO percent saturation.

Common DO technology-based methods.

Result Method	Description
DO-CLARK	Dissolved Oxygen (DO) by Electrochemical Polarographic (Clark) Cell Sensor with Fixed Membrane (Flow Dependent)
DO-OPTICAL (You can also use alias code DO-LDO)	Dissolved Oxygen (DO) by Optical (Luminescent) Sensor (LDO)

Less common DO technology-based methods.

Result Method	Description
DO-CLARK-PULSE	Dissolved Oxygen (DO) by Electrochemical Polarographic (Clark) Cell Sensor with Pulsing Membrane (Flow Independent)
DO-GALVANIC	Dissolved Oxygen (DO) by Electrochemical Galvanic Cell Sensor

Published DO methods (see Important Note About Published Methods).

Result Method	Description
SM4500OG	Dissolved Oxygen (DO) by Membrane Electrode Method (equivalent of Polarographic/Clark or Galvanic)

Conductivity method examples

Also see section below about conductivity vs. specific conductivity.

Common conductivity technology-based methods.

Result Method	Description
COND-METER	Specific Conductivity, field meter

Less common technology-based methods.

Result Method	Description
CONDUCTIVITY-SBE	Conductivity sensor using cylindrical, flow-through, borosilicate glass cell with three internal platinum electrodes & Wein bridge, unique to Sea-Bird Electronics

Published measurement methods (see Important Note About Published Methods).

Result Method	Description
EPA120.1	Specific conductivity (conductance) by conductivity meter @25 deg C

pH method examples

Generic measurement methods

Result Method	Description
PH-METER	pH meter

Published measurement methods (see Important Note About Published Methods).

Result Method	Description
EPA150.1	pH, Electrometric
EPA150.2	pH, Continuous Monitoring (Electrometric)
SM4500H+B	pH by Electrometric Method

Temperature method examples

Technology-based measurement methods

Result Method	Description
TEMP-THERMISTOR	Temperature by thermistor
TEMPHG	Temperature by Mercury Thermometer
TEMPLOGGER	Temperature by data logger

Published measurement methods (see [Important Note About Published Methods](#)).

Result Method	Description
EPA170.1	Temperature by Thermistor
SM2550B	Temperature

Turbidity method examples

Generic measurement methods

Result Method	Description
TURB-SENSOR (added to EIM on 1/13/2026)	Turbidity sensor or probe used in-situ (generic)
TURB-SampleCell (added to EIM on 1/13/2026)	Turbidity meter, cuvette style where sample is removed from the environment and poured into sample cell inserted into meter. *Note: Enter data from this method with Field Activity Collection Type "Sample" and Result Lab Name "Mobile lab at data collector field site"*
TURB-METER	Turbidity meter, type unspecified *Note: we are phasing this method out because it's ambiguous - use one of the two methods above.*

Common Technology-based measurement methods. Only use these methods if you are certain of the details in the description.

Result Method	Description
TURB-FNRM	Turbidity, nephelometric, field non-ratio meter (white light, 90 deg detector only)
TURB-FRM	Turbidity, nephelometric, field ratio meter (white light, 90 deg detector w/correction detectors)

Published measurement methods (see [Important Note About Published Methods](#)).

Result Method	Description
EPA180.1	Turbidity, Nephelometric
SM2130B	Turbidity, Nephelometric Method

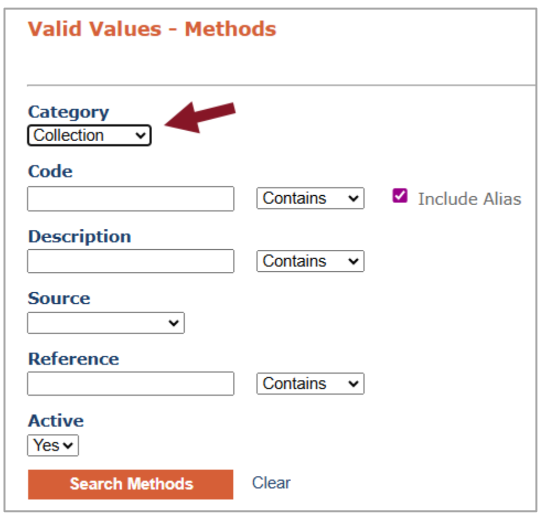
Sample Collection Methods for Measurement Data

Sample collection methods describe how a measurement (or sample) was collected. They go in the Sample Collection Method field (AA) of the Result template. Sample collection methods are optional, but they can help further explain your data, such as using a multi-parameter meter or sonde.

Common Sample Collection Method examples for measurement data.

Sample Collection Method	Description
Multiprobe	Collected using multi-parameter (multi-sensor) probe or sonde

You can search for more collection methods online. Choose “Collection” in the Category drop-down menu.



Calibrating Your Field Meter

You must calibrate your field meters on the schedule specified in your QAPP. The QAPP typically specifies that calibration checks should be done before, after and sometimes during deployments. If the meter fails calibration, data is typically qualified or rejected. It’s important to review the manufacturer’s guidelines for the calibration of your meter.

See a documented calibration procedure example in section 6 of Ecology’s Environmental Assessment Program’s (EAP’s) Standard Operating Procedure EAP033, Version 2.2: Standard Operating Procedures for Hydrolab DataSonde®, MiniSonde®, and HL4 Multiprobes. The SOP outlines EAP’s procedure for calibration and general use of Hydrolabs®.

Correcting for Instrument Drift

Raw time-series data sometimes requires post-deployment adjustment for instrument drift. For example, you might adjust water level transducer measurements for linear instrument drift using manual water level measurements. Document your adjustment process in your QAPP and report. For more information on this topic, see the EIM help for Adjusted Time-Series Data.

Instrument Accuracy and Measurement Precision

Sometimes instruments output result values with more significant digits than the reported accuracy. This conveys a more precise measurement than is possible. Check the instrument's tech sheet and adjust the values before submitting your data to EIM. For example, if your meter reports a conductivity of 100.2365 and the documented accuracy (or resolution) of the instrument is 0.1 uS/cm, you should round your result to 100.2 before submitting it to EIM.

Result Values of Zero

If you get a reading of 0 (zero) from your meter, you must assess it to see if it's valid. Check the instrument's tech sheet. Some meters can accurately report down to zero, but there are a few things to check before submitting your result to EIM:

- Check the instrument's resolution. You may need to adjust the significant digits in the display. For example, if the instrument was set to 2 decimal places, but your value was 0.02, it may display as 0.0.
    - In adjusting for significant digits, consider the precision and accuracy of the instrument. If the instrument can only report to the first decimal place accurately, then it would be imprecise to report to the second decimal place (0.02).
- Was the instrument operating correctly?
- Were there other issues with the instrument where it was not measuring ambient water conditions, such as being submerged in the sediment?
- Don't use zero to indicate no data was collected, or a result was rejected. If you are trying to record a failed attempt to collect data, see the help for submitting Observations to EIM.
- Were there environmental conditions that explain why the value may be zero, such as DO values of zero in the hypolimnion of a stratified lake?

- Consider adding a result comment to explain your result of zero.

Flow measurements of zero

A discrete measurement of flow that is zero is a hydrologically valid result for a stream that was dry or had stagnant water (not flowing). Enter a flow of zero as a measurement record (not an observation), with a result data qualifier of FD (Dry) or FS (Stagnant – No Flow).

For time-series measurements of zero flow that span a long period, consider not submitting the data to EIM or summarize them into an observation. For example, if you have weeks or months of zero flow in a year-long study, consider entering that information as an observation.

Reporting and Detection Limits

EIM doesn't require Reporting and Detection Limits for measurements. Instrument manuals sometimes list precision, resolution, or range, but there is often no detection limit specified. Don't attempt to guess what the detection limit is unless it is specifically stated in the manual or you have contacted the manufacturer for that information.

Results That are Estimates

The result data qualifier "EST" is defined as "Measurement value reported is estimated. See comment for additional detail." For EST-qualified results, enter a comment in the Result Comment or Result Additional Comment field (discrete result template) or in the Comment field (time-series template) that explains why you consider the result to be estimated. EST-qualified data can be usable in some instances but not in others. It's important for the data user to know why you qualified your data with EST.

Field Collection Times

EIM requires Field Collection Start Time for measurements (column G in the Result and Water Level templates). Start times are especially important for field-measured parameters that commonly exhibit diel fluctuation, like dissolved oxygen and temperature. Without the times, the data is less useful for data analysis.

A note about time zones: For discrete data (Result template), EIM automatically assigns a time zone of PDT or PST based on the Field Collection Start Date. For information about how to handle time zone in time-series data, see the "Time zone and daylight saving time" section in our help for How to Submit Time-Series Data to EIM.

Conductivity or Specific Conductivity

The terms conductivity and specific conductivity are sometimes used synonymously, but they are different. Specific conductivity is a temperature-corrected value. Because temperature has a direct effect on conductivity, it is often corrected to a standardized temperature (usually 25 degrees C) for comparability. This is called specific conductivity. Many modern sensors perform automatic temperature correction. Your meter may display results for both conductivity and specific conductivity, and you can report both to EIM. If your meter only displays results for conductivity, verify what it's reporting.

Parameter Name	Parameter Alias Name	Most Common Units
Conductivity	Conductance	umhos/cm uS/cm mS/cm mS/m
Conductivity, Specific (at 25 deg C)	Specific Conductivity Specific Conductivity (at 25 deg C) Specific Conductance Specific Conductance (at 25 deg C)	umhos/cm uS/cm mS/cm mS/m

Dissolved Oxygen or Dissolved Oxygen Percent Saturation

"Dissolved oxygen" refers to the actual amount of oxygen dissolved in a body of water, typically measured in milligrams per liter (mg/L). "Dissolved oxygen percent saturation" represents the percentage of oxygen dissolved in water compared to the maximum amount that can be dissolved at a given temperature and pressure, essentially indicating how close the water is to being fully saturated with oxygen; it is expressed as a percentage (%) value. It is possible for dissolved oxygen to exceed 100% air saturation in water either because of the presence of photosynthetic aquatic oxygen producers or a slow equilibration after atmospheric changes. More information can be found in the EIM help for Dissolved Oxygen (DO) Data.

Parameter Name	Alias	Units
Dissolved Oxygen	DO	mg/L
Dissolved Oxygen Percent Saturation	Dissolved Oxygen Saturation Dissolved Oxygen-Saturation	%

Groundwater Levels

We’re currently drafting guidelines for entering for groundwater level measurements. We’ll link it here when it’s complete.

Document Revision History

Revision date	Revision no.	Summary of changes	Reviser(s)
2026-01-28	1.0	Original document	CN, KS, MP, KC
2026-03-31	1.1	Clarified which fields to put comments in for data qualified with EST	KC