



EnviroDIY Sensor Stations

Quality Control Quick Guide



Stroud Center contacts:

- General:
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- Technical:
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Take the following to site:

- EnviroDIY Field Visit Data Sheet
- Clipboard
- Pencils
- Brush
- Metric ruler
- Conductivity meter (calibrated)
- Thermometer (calibrated)
- Blank microSD card
- Phone or watch
- Other supplementary items
 - Loppers/clippers
 - Camera
 - First Aid kit

At the site do the following:

1. Fill in all header information on Field Visit Data sheet (see A, p. 20).
2. Inspect site and sensors and take photos for before/after perspective (when appropriate).
3. Clean sensors (see following Step 3 details) and record on data sheet (see B, p. 20).
4. Remove debris and vegetation from around logger and solar panel.
5. Do QC Water Level Data (see following Step 5 details) and record on data sheet (see C, p. 20).
6. Do QC Chemistry Data (see following Step 6 details) and record on data sheet (see D, p. 21).
7. Swap SD cards (see following Step 7 details) and record on data sheet (see E, italics, p. 21).
8. Complete Sensor Station Maintenance section on data sheet (see E, p. 21) .
9. Complete General Notes Section on data sheet (see A, p. 20).
10. Take a strategic pause before leaving site.

At home/office do the following:

1. Enter Field Visit Data sheet into online form:
<https://wikiwatershed.org/drwi/>
(password: drwi).
2. Store hard copy data sheet in secure location.
3. Email SD card file to station owner and Stroud contacts (see title page).
4. Communicate with station owner and Stroud about any issues.

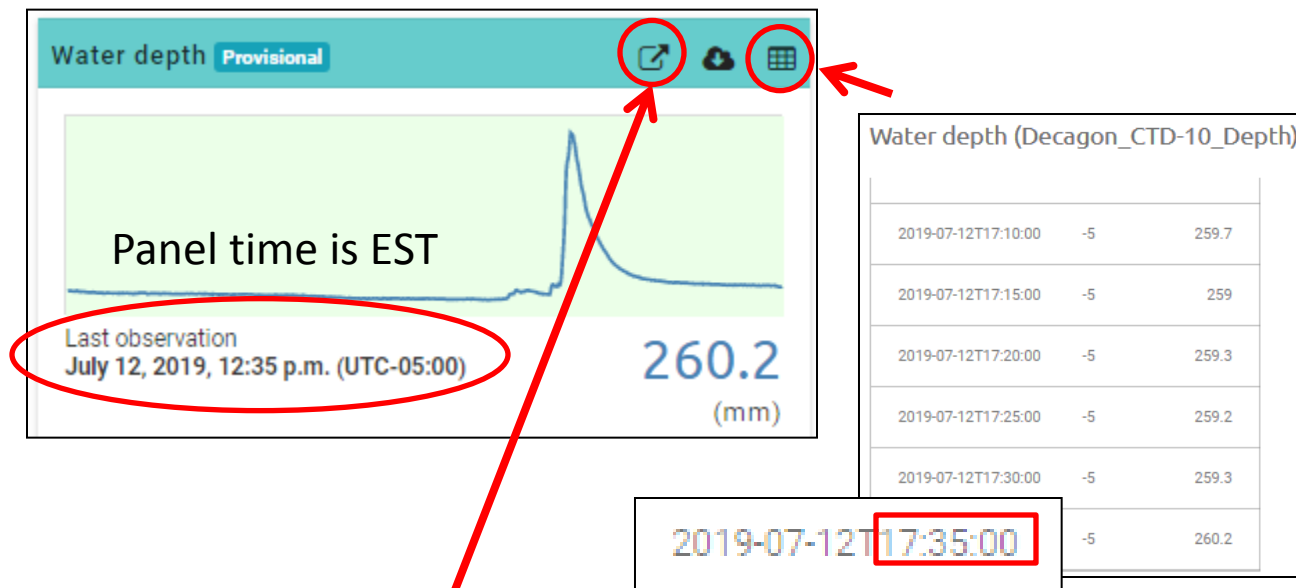
Time zones guide (for usage of Monitor My Watershed):

- EST = Eastern Standard Time (~Nov 4 - March 9)
- EDT = Eastern Daylight Time (“daylight savings”)(~March 8 – Nov 3)
- UTC = Coordinated Universal Time
 - **For the eastern U.S., winter time (EST) is five hours behind UTC and summer time (EDT) is four hours behind UTC.*
- $UTC - 5 = EST$
 - i.e., EST is five hours behind UTC
 - e.g., 11:00p UTC – 5:00 = 6:00p EST
- $UTC - 4 = EDT$
 - i.e., EDT is four hours behind UTC
 - e.g., 11:00p UTC – 4 = 7:00p EDT
- 24hr time (“military”), e.g.:

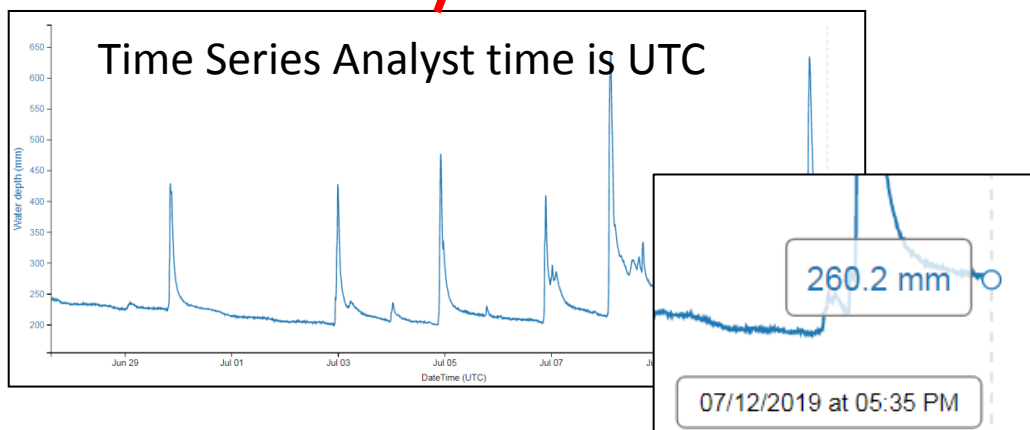
Standard	Military
12:00 AM	0000 hours
12:30 AM	0030 hours
1:00 AM	0100 hours
....
11:00 PM	2300 hours
11:30 PM	2330 hours

Accessing data on MonitorMyWatershed.org:

monitormywatershed.org/sites/MSPL2S/

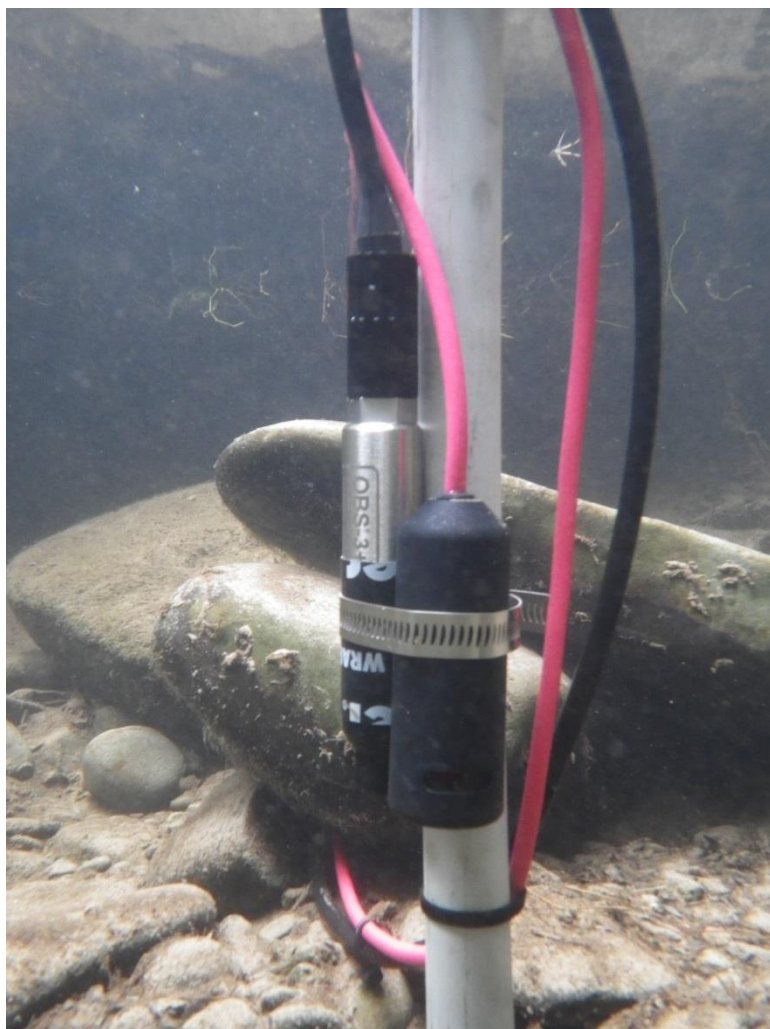


72hr table time is 24hr UTC



3. Cleaning sensors:

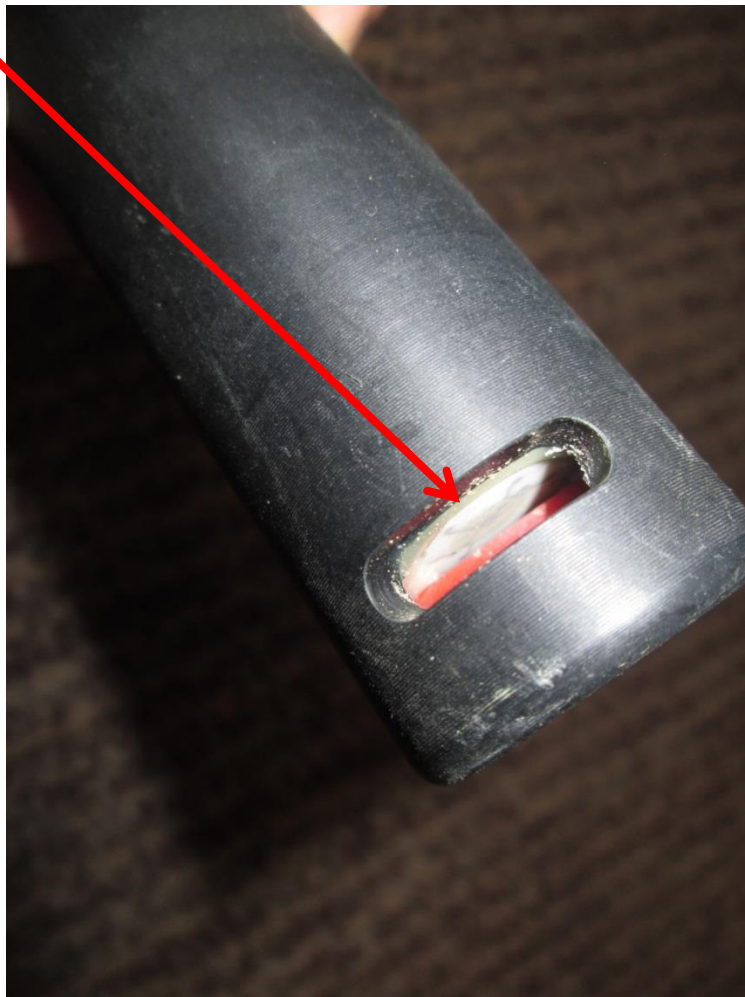
Use the soft long white bristles to remove debris from the entire sensor bundle.



3. Cleaning sensors:

The white disc ceramic coated pressure transducer can be easily damaged.

*Do not touch it with anything when you are cleaning the sensor.



3. Cleaning sensors:



Use the soft white bristles or Q-tip to *gently* clean the four screw heads (conductivity measured here).



3. Cleaning sensors:

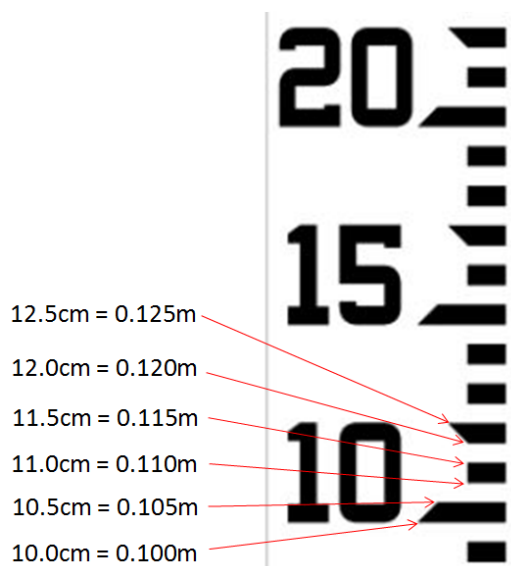


Use the stiff gray bristles and/or your finger to clean the turbidity sensor “eye”.



5. QC Water Level Data:

Record **Staff Gauge Height (m)** and time (i.e., water depth as measured on staff gauge)(see C, p 20).



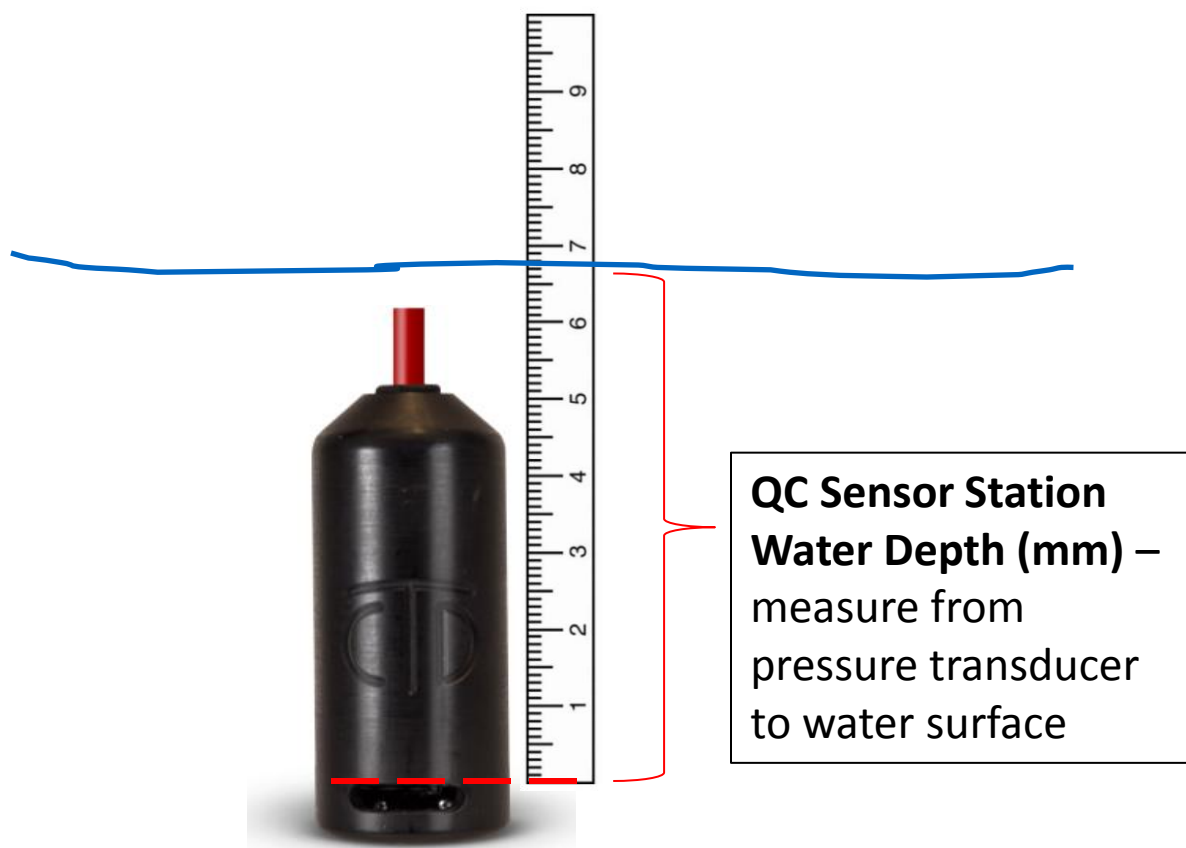
5. QC Water Level Data:

Record **Sensor Station Water Depth (mm)** and time (i.e., water depth as measured by CTD sensor on sensor station) - (see C, p 20).

- Make sure this data point is from about the same time as when you recorded the Staff Gauge Height.
- Access this information on MonitorMyWatershed.org (see MonitorMyWatershed.org Guide, p. 6) or on SD card file (later at home/office).

5. QC Water Level Data:

Record **QC Sensor Station Water Depth (mm)** (i.e., depth as measured by hand using metric ruler) and time (see C, p 20).



5. QC Water Level Data:

Record **Offset (Staff Gauge Height – Sensor Station Water Depth)** - (see C, p 20).

Example:

Staff Gauge Height = 0.45 meters (m) = 450 millimeters

Sensor Station Water Depth = 401 millimeters (mm)

Staff Gauge Height – Sensor Station Water Depth = Offset
450 – 401 = 49 mm

6. QC Chemistry Data:

Record **QC Hand-held Meter Result** and time for Conductivity (See D, p. 21).

DiST 3
HI98303
EC Tester



Always calibrate meter using 1413 $\mu\text{S}/\text{cm}$ standard before taking your measurement.



1413 $\mu\text{S}/\text{cm}$ Conductivity Standard

6. QC Chemistry Data:

Record **QC Hand-held Meter Result** and time for Temperature (See D, p. 21).

Certificate of Calibration
Electronic Thermometer

Calibration Date: 10/25/2018
Manufactured for and distributed by: m-B Instrument

Report No: 1814002
Page 1 of 1

Serial #: 204881 Description: Electronic Thermometer Range: -50.00°C (-58.00°F) to 100.00°C Resolution: 0.1°C, 0.2°C from -50.00°C to 100.00°C Accuracy: ±0.2°C over 100°C	Customer: m-B Instrument Contact: # 800000700 Lab: 180218
Calibration Range: Full As Found: None In Tolerance: Yes Procedure: Lab-20 Calibration Due Date: 10/25/2019	Test Conditions: Temperature: 20°C Humidity: 55%

The above referenced instrument was calibrated by direct measurement of generated temperature using the reference standards listed in the "Test Equipment" table at the bottom of this report. A Pass/Fail decision is made based on the "Test Equipment" table information. This calibration is traceable to NIST and is in compliance with ANSI/ISO 17025. If you have any questions, please contact us at 1-800-850-8500. We will be happy to assist you.

Standard Deviation (°C)	Average Value (Reference) (°C)	Test Factor Test Minimum Error (°C)	Test Factor Test Maximum Error (°C)	Measurement Uncertainty (°C)
0.2	0.2	-1.0	1.0	0.05
0.2	0.2	-1.0	1.0	0.05



ISO 17025:2005 accredited
Calibration Certificate, A2LA
Cert. #2448.01

*Durac thermometer is pre-calibrated, you do not need to calibrate it.

6. QC Chemistry Data:

Record **Sensor Station Result** and time for Conductivity and Temperature (i.e., conductivity and temperature as measured by CTD sensor on sensor station) - (See D, p. 21).

- Make sure these data points are from about the same time as when you recorded the QC Hand-held Meter Results.
- Access this information on MonitorMyWatershed.org (see MonitorMyWatershed.org Guide, p. 6) or on SD card file (later at home/office).

6. QC Chemistry Data:

Record **Chemistry Field Meter Information** for Conductivity and Temperature (See D, p. 21).

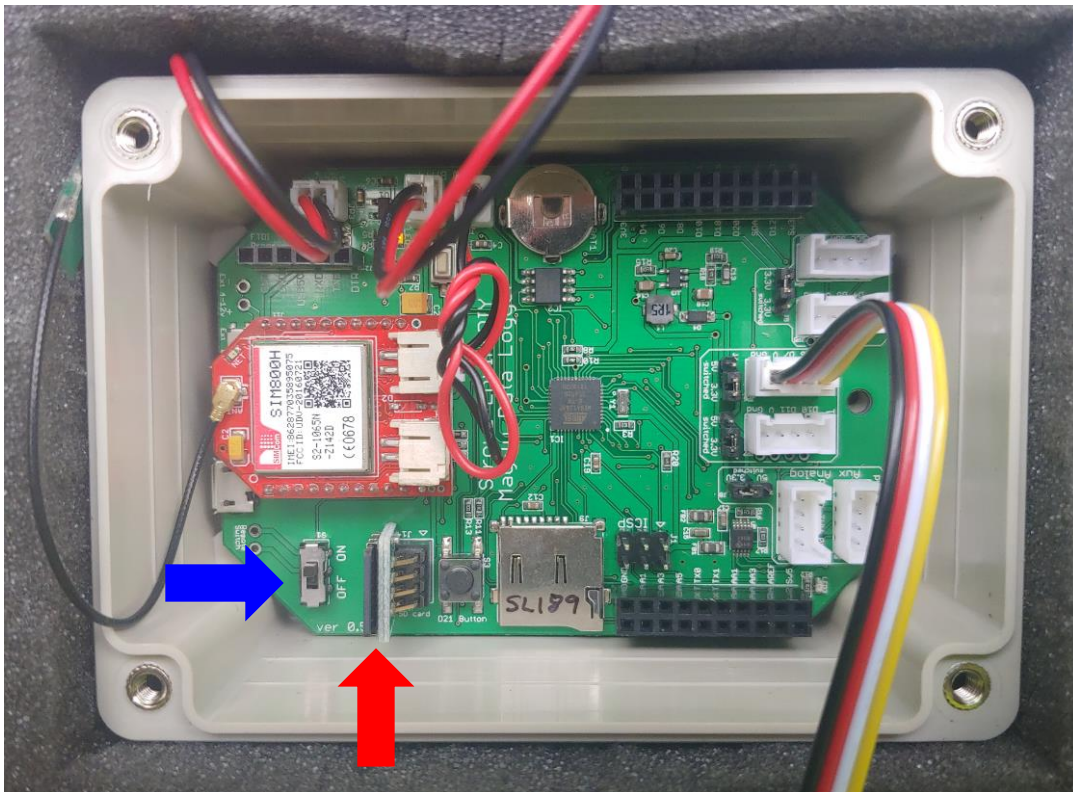
Example:

QUALITY CONTROL CHEMISTRY FIELD METER INFORMATION				
Parameter	Field Meter Brand/Model/Serial # or unique ID	Meter calibrated?	Standard	Calibration
Conductivity (uS/cm):	Hanna Dist 3 Stroud 5	Yes/No	1413	1412
Temperature (degC):	Durac 1229T59	Yes/No		
Turbidity (NTU):		Yes/No		
Dissolved Oxygen (mg/L):		Yes/No		

*Note the thermometer should not need to be recalibrated.

7. Swap SD Cards:

1. Turn logger off (blue arrow)
2. Remove SD card (red arrow)
3. Insert blank SD card
4. Turn logger on



Name(s):

Site ID:

LoggerID:

Stream Name:

Location:

GPS (Lat/Long):

Date: Arrival Time: AM/PM? *EST/EDT?

Photos? Yes/No *

*EST=Eastern Standard Time; EDT=Eastern Daylight Time (Daylight Savings)

Precipitation last 24 Hours? Yes/No Amount:

Water Clarity (Clear, Cloudy, Muddy):

General Notes/ Photo Descriptions:

A

* Upload photos to DRWI Sensor Station Photos folder (<http://bit.ly/2SmhZBK>)

SENSOR CLEANING (Recommended frequency: weekly or biweekly; monthly if only CTD sensor)

*Cleaned Sensors? Yes/No If Yes, exact time:

AM/PM? EST/EDT? *Clean >5 min. before grab sampling

B

GRAB SAMPLES (Rec frequency: Situational; for rating curves, collect when water is highly turbid or higher than normal conductivity)

Grab Sample Taken? Yes/No

Time collected (to minute): AM/PM? EST/EDT?

Sample Number:

Volume:

Bottle Type:

Date Shipped:

Lab Sent To:

Notes:

*SENSOR STATION DATA TO MATCH WITH GRAB SAMPLE LAB RESULTS (Complete in field or office)

Sensor station Conductivity (uS/cm):

Time (military):

Not applicable

Always EST

Sensor station Turbidity (NTU):

Time (military):

Not applicable

Always EST

*For use in Turbidity/TSS and Conductivity/Chloride rating curve development. Record sensor station Cond and Turb data at time nearest to grab sample collection time. Can be completed in field (by accessing online data) or in office (online or download from microSD card). Acquire final grab sample lab results from Stroud Center (or lab that processed sample).

QUALITY CONTROL - WATER LEVEL DATA (Rec frequency: quarterly and/or more frequently as needed)

*Staff Gauge Height (m):

Time:

AM/PM?

EST/EDT?

*Sensor Station Water Depth (mm):

Time (military):

Not applicable

Always EST

*QC Sensor Station Water Depth (mm):

Time:

AM/PM?

EST/EDT?

Offset (=Staff Gauge Height - Sensor Station Water Depth, mm):

C

a - Staff Gauge Height and Sensor Station Water Depth readings should be from about the same time (+/- 5 minutes).

b - Use metric ruler to measure from pressure transducer (white disc in CTD sensor) to water surface. Note - this depth measure may be slightly different from the sensor-measured depth but should be consistent over time.

QUALITY CONTROL - CHEMISTRY DATA (Rec frequency: quarterly and/or more frequently as needed)

Parameter	QC Hand-held Meter Result	QC Time	QC AM/PM?	QC EST/EDT?	Sensor Station Result	Sensor Station- Time (Military, EST)
Conductivity (uS/cm):			AM/PM	EST/EDT		
Temperature (degC):			AM/PM	EST/EDT		
Turbidity (NTU):			AM/PM	EST/EDT		
Dissolved Oxygen (mg/L):			AM/PM	EST/EDT		

QUALITY CONTROL CHEMISTRY FIELD METER INFORMATION

Parameter	Field Meter Brand/Model/Serial # or unique ID	Meter calibrated?	Standard	Calibration
Conductivity (uS/cm):		Yes/No		
Temperature (degC):		Yes/No		
Turbidity (NTU):		Yes/No		
Dissolved Oxygen (mg/L):		Yes/No		

SENSOR STATION MAINTENANCE

<p>Sensors Submerged? Yes/No If no or partially, describe in Notes.</p> <p>Location of Sensors Changed? Yes/No If yes, explain in notes. <i>*Please consult Stroud Center before changing location of sensors.</i></p> <p>Retrieved Memory Card? Yes/No (Rec frequency for QC: quarterly if online; biweekly-monthly if not online)</p> <p>Changed Batteries? Yes/No</p> <p>Cleaned Solar Panel? Yes/No</p> <p>Other sensor station maintenance? Yes/No (If Yes, describe in Notes)</p>	<p>Notes (Describe specific sensor station management actions and any other issues):</p>
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OTHER IN-SITU PARAMETERS (e.g., Nitrate, Phosphate, Chloride, pH, Dissolved Oxygen)

Parameter	Result	Brand/Model

OTHER INFORMATION

Field Duplicate Taken of Grab Sample? Yes/No	Flow Measurement w/ Neutrally Buoyant Object? Yes/No
Performed Cross Section Survey? Yes/No	Flow Measurement w/ another method? Yes/No
Flow Measurement w/ Flow Meter? Yes/No	If Yes, explain in Notes