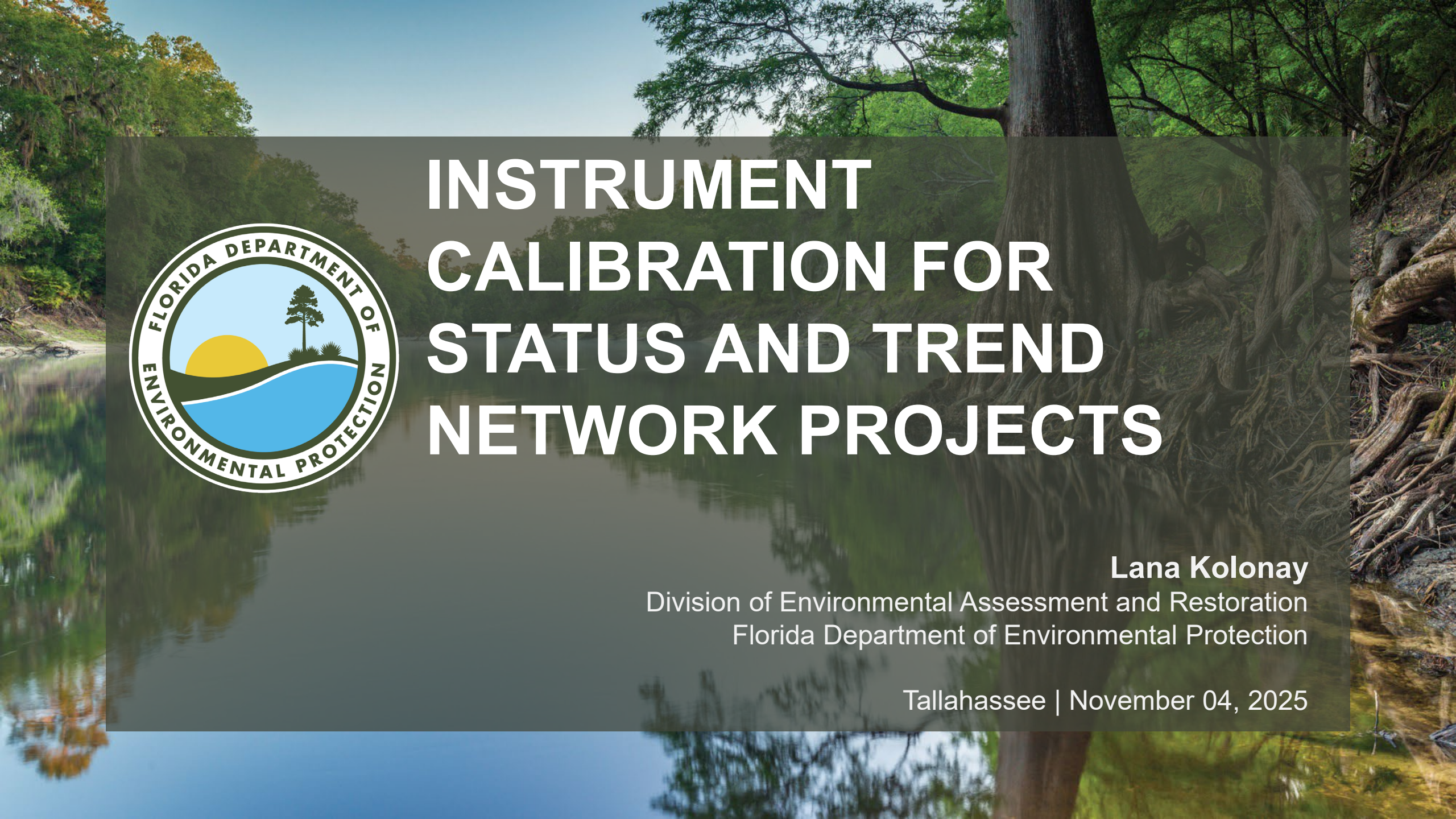

INSTRUMENT CALIBRATION FOR STATUS AND TREND NETWORK PROJECTS

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Tallahassee | November 04, 2025

PRESENTATION OUTLINE

1. Definitions.
2. General requirements.
3. Detailed requirements.
    a) Listed by parameter.
4. Troubleshooting.

DEFINITIONS

Page 17 of the Sampling Manual

Instrument Calibration for Status and Trend Network Projects

DEFINITIONS

Initial Calibration (IC):
The instrument or meter electronics are adjusted to a theoretical value or a known value of a calibration standard.

Initial Calibration Verification (ICV):
The instrument or meter calibration is checked, directly following the initial calibration, by measuring a calibration standard of known value as if it were a sample. The measured result is compared to the calibration acceptance criteria.

DEFINITIONS

Continuing Calibration Verification (CCV):
The instrument or meter calibration is checked or verified by measuring a calibration standard of known value as if it were a sample. The measured result is compared to the calibration acceptance criteria.

Acceptance Criteria:
The numerical limits within which calibration verifications are acceptable.

GENERAL REQUIREMENTS

Instrument Calibration for Status and Trend Network Projects

BRACKETING REQUIREMENTS

Chronologically:
Need verification before collecting field data and verification after collecting field data.

Quantitatively:
Standards used for calibration and verification must encompass range of values observed in field.

All field data must be bracketed by passing calibration or verification data.

SPECIFIC CONDUCTANCE EXAMPLE

BRACKET SAMPLES BY STANDARD RANGE AND TIME

7:30 Calibrate (1000 µmhos/cm)

↓

7:35 ICV (100 µmhos/cm)

↓

10:00 Sample Collection (1525 µmhos/cm)

↓

15:30 End of Day CCV (5000 µmhos/cm)

DOCUMENTATION

Calibration log required for all calibrations and verifications.

- Standard operating procedure (SOP) reference.
- Meter identification (ID).
- Date/Time of each calibration or verification.
- Information about standards.
- Instrument reading.
- Result.
  - Pass or Fail.
- Name of person performing each activity.

CALIBRATION AND VERIFICATION LOG (FDEP SOP FT 1000-FT 1500, FD 1000-FD 4000)

Boldly "X" this box if there are qualified data on this page.

Meter ID: _____ RQ- _____ Project: _____

Notes: (1) Always wait for meter to stabilize before recording any readings.
(2) Report all digits displayed. Do not round before reporting measurements. (See special instructions for depth).
(3) For Calibrations, record calibrated meter reading. Do not record initial meter reading before calibration.

Temperature (Quarterly) FT 1400 Date of Last Temperature Verification _____

DO DEP SOP FT 1500	Name	Date	Time CT-ET	Temp °C	Baro-meter mmHg	D.O. Chart mg/L	Meter D.O. mg/L	% DO	Probe Charge	Probe Gain	Pass / Fail	Lab / Field
Calibr.											P / F	L / F
ICV											P / F	L / F
CCV											P / F	L / F
CCV											P / F	L / F

DO Acceptance criteria from Table ± 0.3 mg/L. **Rapid-Pulse Sensors:** DO Gain Range 0.7 to 1.4; DO Charge Range 25-75.
Optical: DO gain range 0.85 to 1.15 (Pro DSS 0.75 to 1.50); DO charge N/A. **Steady-state & Galvanic Sensors:** DO Gain & Charge N/A.

Spec. Cond. FT 1200	Name	Date	Time CT-ET	Lot #	Expir. Date	Standard µmhos/cm	Meter Reading µmhos/cm	Pass / Fail	Lab / Field
Calibr.								P / F	L / F
ICV								P / F	L / F
CCV								P / F	L / F
CCV								P / F	L / F

Conductivity Acceptance criteria ± 5%

pH DEP SOP FT 1100	Name	Date	Time CT-ET	Lot #	Expir. Date	pH Buffer SU	Temp °C	Meter reading SU	mV	Pass / Fail	Lab / Field
Calibr.						7.				P / F	L / F
Calibr.						4.				P / F	L / F
Calibr.						10.				P / F	L / F
ICV										P / F	L / F
CCV										P / F	L / F
CCV										P / F	L / F

pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50;
If mV are recorded: slope from 7 to 10 _____, slope from 4 to 7 _____ (both must be between 165 and 180 mV)

Does meter have a depth sensor that will be used to measure total depth & sample depth? YES / NO / NA (not surf. water project)
If **YES**, complete daily Calibr. & ICV below and list date of last quarterly depth verification: _____
If **NO**, what will be used? (circle one) **Secchi Disk Line / Sonar** Unique ID: _____; Date of last verification: _____

Depth Sensor (Daily Calibration & ICV)	Name	Date	Time CT-ET	Calibrated Value (0.00 or Offset), meters	ICV Value, meters	Pass / Fail	Lab / Field
Pressure mode in air						P / F	L / F

Report two decimal places. Round numbers ≤ 4 down, ≥ 5 up. ICV acceptance criteria ± 5 % or ± 0.05m, whichever is greater.

COMMENTS:

Form effective August 1, 2018

DOCUMENTATION

- When documenting a date, always include month, day and year.
  - In MM/DD/YYYY format.
- Complete all required fields for each calibration log entry.
  - Acceptable to use arrows/ditto marks.

Spec. Cond. FT 1200	Name	Date	Time CT-ET	Lot #	Expir. Date	Standard µmhos/cm	Meter Reading µmhos/cm	Pass / Fail	Lab / Field
Calibr.	JANE DOE	3/23/2022	07:45	C3PO	04/30/2023	1000	1005	P / F	L / F
ICV	JANE DOE	3/23/2022	08:05	R2D2	05/31/2023	100	101	P / F	L / F
CCV	JANE DOE	3/23/2022	13:55	OBE1	06/30/2023	5000	5015	P / F	L / F
CCV	JANE DOE	3/23/2022	14:00	R2D2	05/31/2023	100	102	P / F	L / F

Conductivity Acceptance criteria ± 5%

Spec. Cond. FT 1200	Name	Date	Time CT-ET	Lot #	Expir. Date	Standard µmhos/cm	Meter Reading µmhos/cm	Pass / Fail	Lab / Field
Calibr.	JANE DOE	3/23/2022	07:45	C3PO	04/30/2023	1000	1005	P / F	L / F
ICV	"	"	08:05	R2D2	05/31/2023	100	101	P / F	L / F
CCV	"	"	13:55	OBE1	06/30/2023	5000	5015	P / F	L / F
CCV	"	"	14:00	R2D2	05/31/2023	100	102	P / F	L / F

Conductivity Acceptance criteria ± 5%

STANDARDS

- Do not reuse standards.
  - Use a fresh aliquot of standard for each activity (IC, ICV and CCV).
- Do not use expired standards.
  - Unless they have been previously verified against other (non – expired standards).
    - Contact Quality Assurance (QA) Officer for requirements.

DETAILED REQUIREMENTS

Instrument Calibration for Status and Trend Network Projects

Parameter	Number of Decimal Places To Record	Calibration / Verification Frequency	Acceptance Criteria
pH	All Displayed	Daily IC, ICV, CCV	± 0.2 SU
Specific Conductance	All Displayed	Daily IC, ICV, CCV	± 5%
Dissolved Oxygen	All Displayed	Daily IC, ICV, CCV	± 0.3 mg/L
Temperature	All Displayed	Quarterly CCV	± 0.5 °C
Turbidity	All Displayed	Daily CCV; Quarterly IC, ICV, secondary standard verification;	0.1 - 10 NTU: ± 10%; 11-40 NTU: ± 8%; 41-100 NTU: ± 6.5%; > 100 NTU: ± 5%
Depth	Cal. / Ver.: 2 for electronic devices; 1 for manual devices Field Meas.: 2 if total depth < 0.6 m; 1 if total depth ≥ 0.6 m	Daily: IC, ICV for Sondes. Quarterly: Verify Sondes & Electronic Devices. Every 6 months: Inspect Manual Devices.	ICV: ± 5% or ± 0.05 m, whichever is greater; Electronic Device Check: ± 10%; Line Increments: ± 10%; Total Length of Lines: ± 5%;

SU = Standard Units.
NTU = Nephelometric Turbidity Units.

Parameter	Number of Decimal Places To Record	Calibration / Verification Frequency	Acceptance Criteria
pH	All Displayed	Daily IC, ICV, CCV	± 0.2 SU
Specific Conductance	All Displayed	Daily IC, ICV, CCV	± 5%
Dissolved Oxygen	All Displayed	Daily IC, ICV, CCV	± 0.3 mg/L
Temperature	All Displayed	Quarterly CCV	± 0.5 °C
Turbidity	All Displayed	Daily CCV; Quarterly IC, ICV, secondary standard verification;	0.1 - 10 NTU: ± 10%; 11-40 NTU: ± 8%; 41-100 NTU: ± 6.5%; > 100 NTU: ± 5%
Depth	Cal. / Ver.: 2 for electronic devices; 1 for manual devices Field Meas.: 2 if total depth < 0.6 m; 1 if total depth ≥ 0.6 m	Daily: IC, ICV for Sondes. Quarterly: Verify Sondes & Electronic Devices. Every 6 months: Inspect Manual Devices.	ICV: ± 5% or ± 0.05 m, whichever is greater; Electronic Device Check: ± 10%; Line Increments: ± 10%; Total Length of Lines: ± 5%;

DAILY CALIBRATION PROCEDURES

DISSOLVED OXYGEN, SPECIFIC CONDUCTANCE AND pH

Required.

- IC at beginning of day.
- ICV immediately following IC.
- CCV at end of day.

Recommended.

- Mid-day CCV at sample site.
  - Required if end of day CCV routinely fails.

pH

- Check pH millivolts at least weekly.
  - Daily check recommended.
- Always begin three-point calibration with pH 7.0 buffer.
- Rinse well with de-ionized (DI) water (required) and fresh buffer (recommended) before each calibration or verification activity.
- Select buffers to bracket values measured in the field.
  - May need buffers < 4.0 or > 10.0.
- pH of buffer solutions varies with temperature.
  - If using adjusted calibration values, you need to adjust expected value for verifications.

pH

Document temperature-adjusted pH buffer value (from container / reference chart) when using a meter with auto buffer recognition and populated temperature-adjusted pH calibration values.

pH DEP SOP FT 1100	Name	Date	Time CT-ET	Lot #	Expir. Date	pH Buffer SU	Temp °C	Meter reading SU	mV	Pass / Fail	Lab / Field
Calibr.	JANE DOE	3/23/2022	6:45	8675309	1/31/2023	7.03	18.0	7.03	-37.9	(P) / F	(L) / F
Calibr.	JANE DOE	3/23/2022	6:47	7765577	1/31/2023	4.00	18.0	4.00	138.7	(P) / F	(L) / F
Calibr.	JANE DOE	3/23/2022	6:49	6488888	1/31/2023	10.08	18.0	10.08	-204.5	(P) / F	(L) / F
ICV	JANE DOE	3/23/2022	6:53	7765577	1/31/2023	4.00	18.3	4.02		(P) / F	(L) / F
CCV	JANE DOE	3/23/2022	14:10	6488888	1/31/2023	10.12	15.0	10.30		(P) / F	L / (F)
CCV										P / F	L / F

pH Acceptance criteria ± 0.2 SU; mV pH 7 Range 0 ± 50; mV pH 4 Range +180 ± 50; mV pH 10 Range -180 ± 50;
If mV are recorded: slope from 7 to 10 166.6, slope from 4 to 7 176.6 (both must be between 165 and 180 mV)

SPECIFIC CONDUCTANCE

- Always use Potassium Chloride (KCl) standards.
- Rinse well with DI and fresh standard before each calibration point or reading.
- Select standards to bracket values measured in the field.
- If observed field values are lower than 100 µmhos/cm, you must use the 100 µmhos/cm standard for CCV.
- You do not need to use standards lower than 100 µmhos/cm.
- For all YSI models, manually enter standard value during calibration.
  - No auto-recognition of standards.

SPECIFIC CONDUCTANCE

If all field measurements < 100 µmhos/cm

Spec. Cond. FT 1200	Name	Date	Time CT-ET	Lot #	Expir. Date	Standard µmhos/cm	Meter Reading µmhos/cm	Pass / Fail	Lab / Field
Calibr.	JANE DOE	3/23/2022	07:45	C3PO	04/30/2023	1000	1005	P / F	L / F
ICV	JANE DOE	3/23/2022	08:05	R2D2	05/31/2023	100	101	P / F	L / F
CCV	JANE DOE	3/23/2022	13:55	R2D2	05/31/2023	100	102	P / F	L / F
CCV								P / F	L / F

Conductivity Acceptance criteria ± 5%

If field measurements have wide range:
Some > 1000 µmhos/cm and some < 100 µmhos/cm

Spec. Cond. FT 1200	Name	Date	Time CT-ET	Lot #	Expir. Date	Standard µmhos/cm	Meter Reading µmhos/cm	Pass / Fail	Lab / Field
Calibr.	JANE DOE	3/23/2022	07:45	C3PO	04/30/2023	1000	1005	P / F	L / F
ICV	JANE DOE	3/23/2022	08:05	R2D2	05/31/2023	100	101	P / F	L / F
CCV	JANE DOE	3/23/2022	13:55	OBE1	06/30/2023	5000	5015	P / F	L / F
CCV	JANE DOE	3/23/2022	14:00	R2D2	05/31/2023	100	102	P / F	L / F

Conductivity Acceptance criteria ± 5%

DISSOLVED OXYGEN

- Calibrate with water-saturated air or air-saturated water methods.
- Temperature sensitive.
  - Use room temperature water.
  - Allow meter temperature and dissolved oxygen (DO) to stabilize before calibrating.
- Inspect probe for damage daily.
- Check DO gain and charge at least weekly.
  - Gain checked for both membrane and optical.
  - Charge checked for membrane probes.
- If multiprobe device is equipped with an internal barometer, verify barometer annually.

DO

For each calibration or verification, document:

- Barometer value (760 mm Hg or internal barometer reading).
- Temperature (°C).
- DO mg/L.
- DO percent saturation.

Compare DO mg/L meter reading to “Solubility of Oxygen in Water” reference table value for matching temperature and barometric pressure.

Solubility of oxygen in fresh water at various temperatures and pressures. (Solubility shown in milligrams per liter.)

Values based on published equations by Benson and Krause (1980 and 1984). Results from DOTABLES program at https://water.usgs.gov/software/DOTABLES/.

	Barometric Pressure (mm Hg)																	
Temp. (°C)	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767
19.0	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.4	9.4
19.1	9.1	9.1	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
19.2	9.1	9.1	9.1	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.3	9.3	9.3	9.3	9.3	9.3	9.3
19.3	9.1	9.1	9.1	9.1	9.1	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.3	9.3	9.3	9.3	9.3

Parameter	Number of Decimal Places To Record	Calibration / Verification Frequency	Acceptance Criteria
pH	All Displayed	Daily IC, ICV, CCV	± 0.2 SU
Specific Conductance	All Displayed	Daily IC, ICV, CCV	± 5%
Dissolved Oxygen	All Displayed	Daily IC, ICV, CCV	± 0.3 mg/L
Temperature	All Displayed	Quarterly CCV	± 0.5 °C
Turbidity	All Displayed	Daily CCV; Quarterly IC, ICV, secondary standard verification;	0.1 - 10 NTU: ± 10%; 11-40 NTU: ± 8%; 41-100 NTU: ± 6.5%; > 100 NTU: ± 5%
Depth	Cal. / Ver.: 2 for electronic devices; 1 for manual devices Field Meas.: 2 if total depth < 0.6 m; 1 if total depth ≥ 0.6 m	Daily: IC, ICV for Sondes. Quarterly: Verify Sondes & Electronic Devices. Every 6 months: Inspect Manual Devices.	ICV: ± 5% or ± 0.05 m, whichever is greater; Electronic Device Check: ± 10%; Line Increments: ± 10%; Total Length of Lines: ± 5%;

TEMPERATURE

- Perform quarterly CCV.
- Compare meter reading to National Institute of Standards and Technology (NIST) traceable thermometer reading.
- Perform verification at two different temperatures.
  - Ice bath and warm water bath.

Quarterly Temperature Verification Log - DEP Regional Operation Centers

DEP SOP FT 1400. Acceptance Criteria for Temp. ± 0.5°C.

Record all digits displayed for temperature readings. Do not round before reporting measurements.

CCV = Continuing Calibration Verification. Target temperature for cold CCV is 0 - 10 (°C). Target temperature for hot CCV is 30 - 40 (°C).

Time Zone (circle one): **ETZ / CTZ**

Field Meter ID	Field Meter Serial Number	NIST Reference Device ID	Activity Date	Cold CCV Time	Cold CCV Field Meter Temp (°C)	Cold CCV NIST Temp (°C)	Cold CCV Result (circle one)	Hot CCV Time	Hot CCV Field Meter Temp (°C)	Hot CCV NIST Temp (°C)	Hot CCV Result (circle one)	Activity Performed By (Staff Name)	Comments
							P / F				P / F		
							P / F				P / F		

Parameter	Number of Decimal Places To Record	Calibration / Verification Frequency	Acceptance Criteria
pH	All Displayed	Daily IC, ICV, CCV	± 0.2 SU
Specific Conductance	All Displayed	Daily IC, ICV, CCV	± 5%
Dissolved Oxygen	All Displayed	Daily IC, ICV, CCV	± 0.3 mg/L
Temperature	All Displayed	Quarterly CCV	± 0.5 °C
Turbidity	All Displayed	Daily CCV; Quarterly IC, ICV, secondary standard verification;	0.1 - 10 NTU: ± 10%; 11-40 NTU: ± 8%; 41-100 NTU: ± 6.5%; > 100 NTU: ± 5%
Depth	Cal. / Ver.: 2 for electronic devices; 1 for manual devices Field Meas.: 2 if total depth < 0.6 m; 1 if total depth ≥ 0.6 m	Daily: IC, ICV for Sondes. Quarterly: Verify Sondes & Electronic Devices. Every 6 months: Inspect Manual Devices.	ICV: ± 5% or ± 0.05 m, whichever is greater; Electronic Device Check: ± 10%; Line Increments: ± 10%; Total Length of Lines: ± 5%;

TURBIDITY

FOR GROUNDWATER PROJECTS ONLY

- Place meter on level surface.
- Check cuvette for scratches.
- Dry cuvette with lint-free wipe.
- Handle cuvette carefully.
  - No fingerprints or dirt on glass.
- Ensure cuvette orientation is correct when inserting into meter.

TURBIDITY

FOR GROUNDWATER PROJECTS ONLY

- Use portable turbidimeter with tungsten filament light source.
  - Hach 2100P or Hach 2100Q.
- Two types of standards:
  - Primary formazin.
    - Required.
    - Requires agitation before use.
    - Temperature sensitive.
      - Use between 0°Celsius (C) and 25°C.
  - Secondary gel.
    - Optional.
    - Used for CCVs only.
    - Values are assigned by instrument user after each meter calibration.
    - Assigned values are instrument and calibration-specific.
    - If meter is recalibrated, must also redo verification of secondary gel standards.
    - Do not require agitation and are less temperature sensitive.

TURBIDITY

FOR GROUNDWATER PROJECTS ONLY

Quarterly Requirements.

- IC using at least two primary formazin standards.
- ICV immediately after IC using at least one primary formazin standard.
- If using secondary gel standards, verify all secondary gel standards immediately after ICV.
    - Read each gel standard and assign current reading as the standard's value.

Daily Requirements.

- CCV using at least one secondary gel standard or primary formazin standard.

For all verifications (ICV and CCVs).

- Do not use turbidity–free water or < 0.1 NTU standard.

DOCUMENTATION

TURBIDITY CALIBRATION LOG

Quarterly Activities

Daily Activities

Turbidity Calibration Log (DEP SOPs FT1000 & FT1600)
Regional Operations Centers

Meter ID:_____ Date of Last Calibration:_____ Project Name:_____

Quarterly Calibration

Sampler Name:_____ Date:_____ Time:_____ ETZ / CTZ *(circle one)*

Standard Value *(Use Primary Formazin Standards)*	Exp. Date	Lot #	Type of Information Displayed During Calibraiton? *(circle one)*	Value Displayed NTU	Calibration Pass / Fail *(circle one)*
NTU			Meter Reading / Next Value		P / F
NTU			Meter Reading / Next Value		P / F
NTU			Meter Reading / Next Value		P / F
NTU			Meter Reading / Next Value		P / F

Initial Calibration Verification (ICV) *(Only perform ICV immediately after quarterly calibr. Do not use < 0.1 NTU standard for ICV.)*

Sampler Name:_____ Date:_____ Time:_____ ETZ / CTZ *(circle one)*

Standard Value *(Use A Primary Formazin Standard)*	Exp. Date	Lot #	Meter Reading NTU	Pass / Fail *(circle one)*
NTU				P / F

Secondary Gel Standard Quarterly Verification *(perform gel standard verificaiton immediately after quarterly calib. and ICV)*

Sampler Name:_____ Date:_____ Time:_____ ETZ / CTZ *(circle one)*

Standard Value Range NTU	Previous Value Assigned NTU	Exp. Date	Lot #	Meter Reading NTU *(new value assigned)*	Acceptable Range, NTU *(Calculate using new value assigned & acceptance criteria*)*
0 – 10					
10 – 100					
100 - 1000					

Daily Continuing Calibration Verification (CCV) *(required every day that meter is used)*

Date	Time (24hr) CT-ET	Sampler Name	Standard Type *(circle one)*	Standard Value NTU	Exp. Date	Lot #	Meter Reading NTU	Pass / Fail
			Formazin / Gel					P / F
			Formazin / Gel					P / F
			Formazin / Gel					P / F
			Formazin / Gel					P / F
			Formazin / Gel					P / F
			Formazin / Gel					P / F
			Formazin / Gel					P / F
			Formazin / Gel					P / F
			Formazin / Gel					P / F

Comments:

*Acceptance Criteria: 0.1-10 NTU → ± 10 %; 11-40 NTU → ± 8 %; 41-100 NTU → ± 6.5 %; >100 NTU → ± 5 %;
Acceptable ranges for common standards: 20 NTU (18.4 - 21.6 NTU); 100 NTU (93.5 – 106.5 NTU); 800 NTU (760 - 840 NTU)

Form Effective October 1, 2017

Parameter	Number of Decimal Places To Record	Calibration / Verification Frequency	Acceptance Criteria
pH	All Displayed	Daily IC, ICV, CCV	± 0.2 SU
Specific Conductance	All Displayed	Daily IC, ICV, CCV	± 5%
Dissolved Oxygen	All Displayed	Daily IC, ICV, CCV	± 0.3 mg/L
Temperature	All Displayed	Quarterly CCV	± 0.5 °C
Turbidity	All Displayed	Daily CCV; Quarterly IC, ICV, secondary standard verification;	0.1 - 10 NTU: ± 10%; 11-40 NTU: ± 8%; 41-100 NTU: ± 6.5%; > 100 NTU: ± 5%
Depth	Cal. / Ver.: 2 for electronic devices; 1 for manual devices Field Meas.: 2 if total depth < 0.6 m; 1 if total depth ≥ 0.6 m	Daily: IC, ICV for Sondes. Quarterly: Verify Sondes & Electronic Devices. Every 6 months: Inspect Manual Devices.	ICV: ± 5% or ± 0.05 m, whichever is greater; Electronic Device Check: ± 10%; Line Increments: ± 10%; Total Length of Lines: ± 5%;

DEPTH

SURFACE WATER PROJECTS ONLY

Parameter	Number of Decimal Places To Record	Calibration / Verification Frequency	Acceptance Criteria
Depth	Cal. / Ver.: 2 for electronic devices; 1 for manual devices Field Meas.: 2 if total depth < 0.6 m; 1 if total depth ≥ 0.6 m	Daily: IC, ICV for Sondes. Quarterly: Verify Sondes & Electronic Devices. Every 6 months: Inspect Manual Devices.	ICV: ± 5% or ± 0.05 m, whichever is greater; Electronic Device Check: ± 10%; Line Increments: ± 10%; Total Length of Lines: ± 5%;

Rounding Rule.

- Numbers ≤ 4 are rounded down.
  - E.g. 3.14 becomes 3.1.
- Numbers ≥ 5 are rounded up.
  - E.g. 6.89 becomes 6.9.

DEPTH

SURFACE WATER PROJECTS ONLY

Daily Requirement

- Zero depth sensor on field multi-parameter meters (if applicable) and perform ICV.
- Acceptance criteria ± 5 percent or ± 0.05 m, whichever is greater.

Source: Yellow Springs Instruments

DEPTH

SURFACE WATER PROJECTS ONLY

Quarterly Requirements.

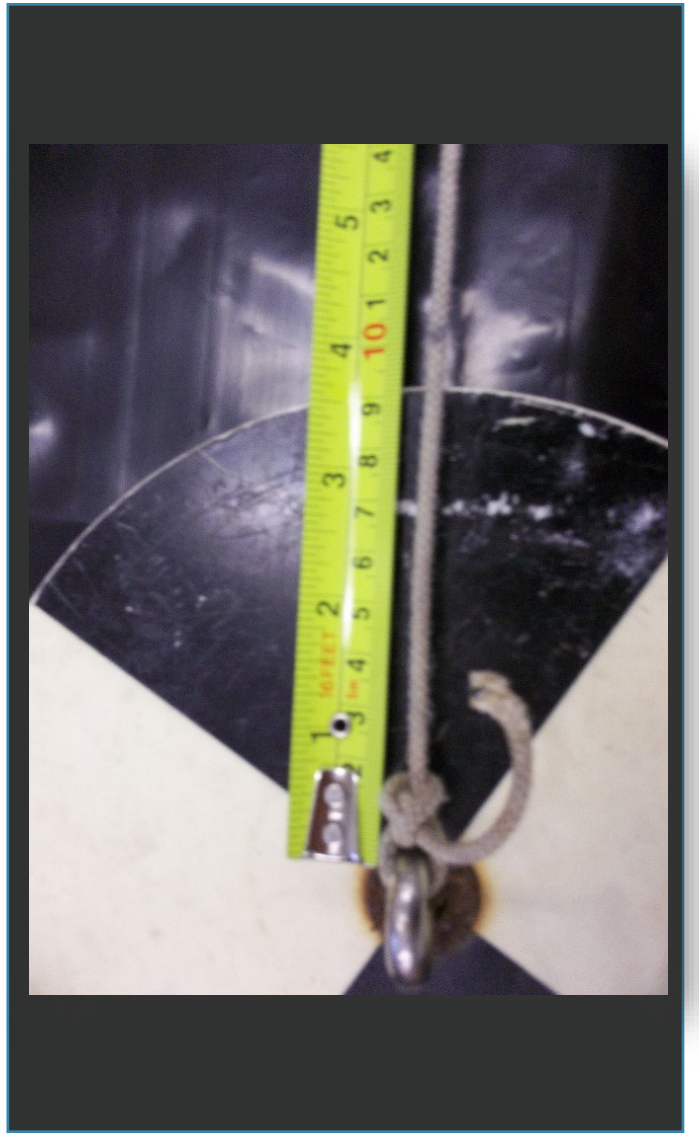
- Check all electronic devices used for depth measurement.
- Compare reading to a reference device.
  - Graduated bucket, metal measuring tape, verified Secchi disk line.
- Acceptance criteria ± 10 percent.

DEPTH

SURFACE WATER PROJECTS ONLY

Every six months.

- Compare all lines used for depth measurements to a reference device.
- Redo markings as needed.
- Check incremental marking.
  - Acceptance criteria ± 10%.
- Check total length.
  - Check up to greatest anticipated depth in field.
  - Acceptance criteria ± 5%.



DEPTH
QUARTERLY VERIFICATION LOG

Depth Sensor Verification Log - DEP Regional Operation Centers

SOP - Status and Trend Networks Sampling Manual and ROC Training Manual.

Report two decimal places for electronic devices. Report one decimal place for manual devices. Numbers ≤ 4, are rounded down; numbers ≥ 5 are rounded up.

Acceptance criteria for electronic device verification ± 5%. Acceptance criteria for analog device incremental markings check ± 10%. Acceptance criteria for analog device total length of line verification ± 5%.

Time Zone (circle one): **ETZ / CTZ**

Field Device Type (Field Meter / Sonar / Secchi)	Field Device ID	Field Meter Serial Number	Verification Location	Reference Device	Verification Date	Verification Time	Electronic Device Verification - Field Device Depth (m)	Electronic Device Verification - Reference Device Depth (m)	Electronic Device Verification - Result (circle one)	Analog Device - Incremental Markings Check (every 0.1m) - Result (circle one)	Analog Device - Total Length of Line Verification - Field Device Measurement (m)	Analog Device - Total Length of Line Verification - Reference Device Measurement (m)	Analog Device - Total Length of Line Verification - Result (circle one)	Analog Device - Markings Redone (circle one)	Activity Performed By (Staff Name)	Comments
									P / F	P / F			P / F	Y / N		
									P / F	P / F			P / F	Y / N		
									P / F	P / F			P / F	Y / N		
									P / F	P / F			P / F	Y / N		
									P / F	P / F			P / F	Y / N		
									P / F	P / F			P / F	Y / N		

DEPTH

SURFACE WATER PROJECTS ONLY

- When comparing depth measuring device to reference device, document reading from both devices.
  - Quarterly verifications for electron devices.
  - Six-month verifications of manual device total length.

6 MONTH VERIFICATION OF MANUAL DEVICES (SECCHI DISK, WEIGHTED LINE, ETC.)

Secchi/Weighted Line ID#:_____ Date of Last Verification: _____

Date: _____ Time: _____ ETZ / CTZ Verification Location: ____Lab____

Person Performing Verification: _____

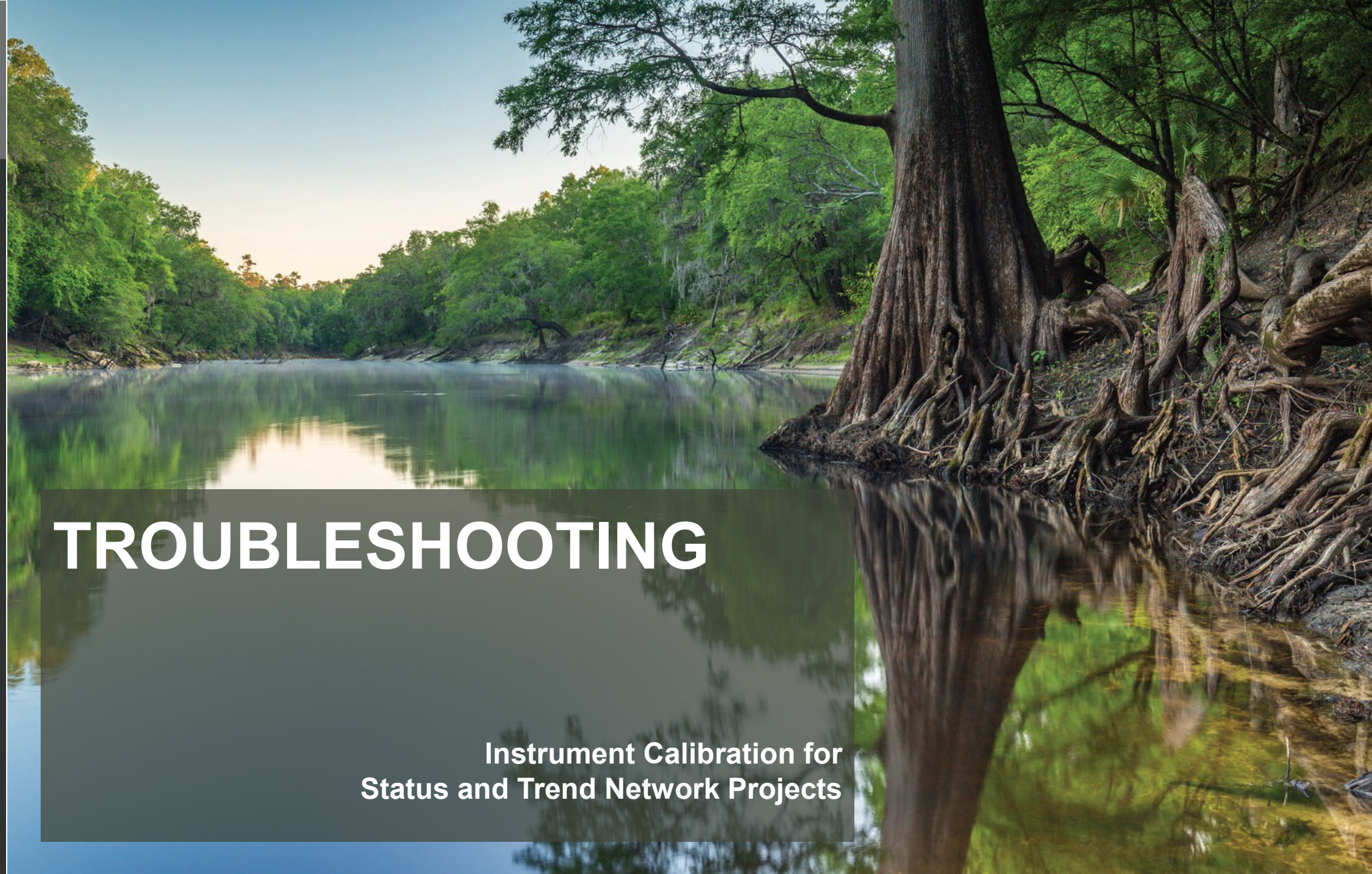
Reference Device: Metal Measuring Tape / Meter Stick / Other _____

Incremental markings of 0.1 m checked: YES / NO Result: Pass / Fail (acceptable criteria 10%)

Total length of line (up to anticipated depth encountered in field) checked: YES / NO

Total Length: indicated by line markings 6.0 m ; measured by reference device 6.1 m

Result: Pass / Fail (acceptable criteria of 5%) Markings redone: YES / NO



TROUBLESHOOTING

Instrument Calibration for
Status and Trend Network Projects

TROUBLESHOOTING

Calibration or ICV Fails.

- Perform maintenance/cleaning and attempt IC again.
- Do not use meter for data collection until issue is resolved.

CCV Fails.

- Rinse probe with standard and attempt CCV again.
- If failure still present, affect field data must be “J” qualified.
    - Add a comment describing the problem.

Bracketing Requirements Not Met.

- Affected field data must be “J” qualified.
    - Add a comment describing the problem.

THANK YOU

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FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION