

COLLOCATED TRANSFER STANDARD VERIFICATION SOP

NIST-Traceable Audit Protocols, Level 1-3 Standards, and As-Found/As-Left Verification

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Target Network:	CASTNet / EPA AQS Ambient Monitoring	Review Cycle:	Annual / QAPP Compliant

1. PURPOSE & PRINCIPLE

This SOP defines the field verification protocol for on-site ambient monitoring sensors using certified, NIST-traceable transfer standards. Collocated comparison establishes the quantitative relationship between a known standard and instrument response without disturbing permanent mountings.

2. TRANSFER STANDARD HIERARCHY

- **Level 1 Primary Standard:** Maintained at EPA Regional Laboratories or primary calibration facilities.
- **Level 2 Field Transfer Standard:** Certified via 6-by-6 verification against Level 1 standards and transported by field specialists.
- **Level 3 In-Station Reference:** Dedicated station transfer standard used for nightly automated zero/span checks.

3. COLLOCATED VERIFICATION WORKFLOW

- **Pre-Visit Audit:** Verify that transfer standard certification documentation is current and NIST-traceable.
- **Sensor Collocation:** Mount the Level 2 reference sensor adjacent to the on-site sensor (e.g., solar pyranometer on shared bracket or aspirated AT/RH probe) and log parallel data for a minimum of 3 hours.
- **'As-Found' vs 'As-Left' Audits:** Record unadjusted 'as-found' readings. If differences exceed QAPP limits, replace the sensor or adjust multipliers, then perform 'as-left' verification.
- **Photo Documentation:** Capture high-resolution photographs of tower sensors, instrument racks, and calibration setups during every visit.

4. ACCEPTANCE CRITERIA SUMMARY

Parameter System	Transfer Standard Type	Collocated Acceptance Limit
Ambient Temperature	NIST Calibrated Thermistor / Bath	Difference <= 0.5 °C across range
Relative Humidity	Aspirated Transfer RH Probe	Difference <= 3.0% RH (3-hour avg)
Solar Radiation	Level 2 Reference Pyranometer	Difference <= 5.0% or 10 W/m²
Ozone Analyzer	Level 2 UV Photometric Standard	Slope 1.00 ± 0.03; diff <= ±2.1%
Wind Speed / Dir	Anemometer Drive / Linearity Disc	Speed <= 0.2 m/s; Dir <= 3.0°

DOCUMENT AUTHORIZATION & SIGN-OFF

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