NEON SITE ACCEPTANCE TEST PROCEDURES: WET DEPOSITION COLLECTOR (NADP AND ISOTOPE)

PREPARED BY	ORGANIZATION	DATE
A. Tennery	I&V	10/27/2015
T. Ploeger	I&V	10/27/2015

APPROVALS	ORGANIZATION	APPROVAL DATE
Kate Thibault	SCI	05/26/2022

RELEASED BY	ORGANIZATION	RELEASE DATE
Tanisha Waters	CM	05/26/2022

See configuration management system for approval history.

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Change Record

REVISION	DATE	ECO #	DESCRIPTION OF CHANGE
A	10/27/2015	ECO-03195	Initial Release
B	05/26/2022	ECO-06832	• Revised NEON logo and fine print

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LIST OF TABLES AND FIGURES

1 DESCRIPTION

1.1 Purpose

The purpose of this document is to provide in-depth procedures and guidance for use in Systems Engineering acceptance testing of the Wet Deposition Collector.

1.2 Scope

This document contains procedures and guidance for acceptance testing of the Wet Deposition Collector. Some of the procedures are common to integration and verification activities.

2 RELATED DOCUMENTS AND ACRONYMS

2.1 Applicable Documents

Applicable documents contain information that shall be applied in the current document. Examples are higher level requirements documents, standards, rules and regulations.

AD [01]	NEON.DOC.004238	NEON System Architecture
AD [02]	NEON.DOC.000135	NEON IVVC Test Strategy
AD [03]	NEON.DOC.000148	NEON IVVC Test Plan

2.2 Reference Documents

Reference documents contain information complementing, explaining, detailing, or otherwise supporting the information included in the current document.

RD [01]	NEON.DOC.000006	NEON Quality Management Plan
RD [02]	NEON.DOC.000008	NEON Acronym List
RD [03]	NEON.DOC.000243	NEON Glossary of Terms
RD [04]	CD06920000	NEON Drawing: Subsystem, Wet Deposition Collector, Tower

2.3 External References

External references contain information pertinent to this document, but are not NEON configuration-controlled. Examples include manuals, brochures, technical notes, and external websites.

ER [01]	
ER [02]	
ER [03]	

2.4 Acronyms

For additional definitions of acronyms please reference RD[02].

Acronym	Definition
CI	Cyber-infrastructure
CMS	Configuration Management System
DAS	Data Acquisition System
DMM	Digital Multimeter

3 EQUIPMENT AND SETUP

3.1 Test Equipment and Tools

Following is a full list of test equipment, tools and related software:

Table 1. Test equipment and tools

Item	Manufacturer	Model	Kit	Comments
Toughbook/Tablet/Laptop			Personal	
Digital Camera			Personal	
Digital Level			Team	
Multimeter (DMM)			Team	

4 ACCEPTANCE PROCEDURES

For protection of personnel and hardware, this procedure must be performed at a time when there is no precipitation.

4.1 Sensor Assembly Initial Checkout

Step	Instructions	Requirement Reference	Notes/Results
1	Check that the Wet Depsoition Collector Assembly is present as expected and complete. Compare with RD[04]	NEON.TIS.4.1170	Pass / Fail
2	Document with pictures if any component is missing / damaged and contact Integration to initiate replacement/repair work.	[-]	
3	Record all asset tag and Maximo ID information for sensor, PRT and grape	[-]	Sensor Asset #: _____ Maximo #: _____ PRT Asset #: _____ Maximo #: _____ Grape Asset #: _____ Maximo #: _____
4	Using Data Monitor (DM), verify all sensor ID chips and grape xml files contain correct asset information (matches ID tags), calibration files and Calibration dates.	[-]	
5	Open the previously recorded data file and verify that the PRT is sampled at a rate of 0.1 Hz.	NADP.TIS.6.1165	Pass / Fail

4.2 Acceptance Prep (After Sensor Installation)

Step	Instructions	Requirement Reference	Notes/Results
2	Note file ID of first picture taken for Wet Deposition Collector.	[-]	
3	Record the approximate outside ambient temperature.	[-]	
4	Assemble tools and PPE	[-]	
5	Access tower top/NADP	[-]	

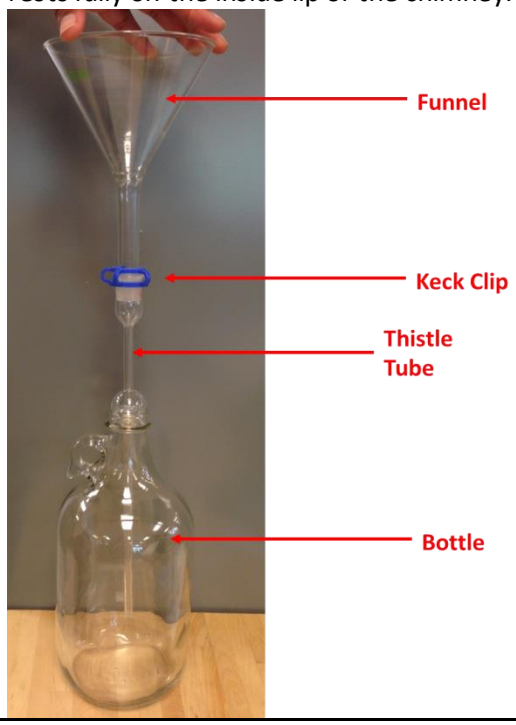
4.3 Positioning and Proximity Check

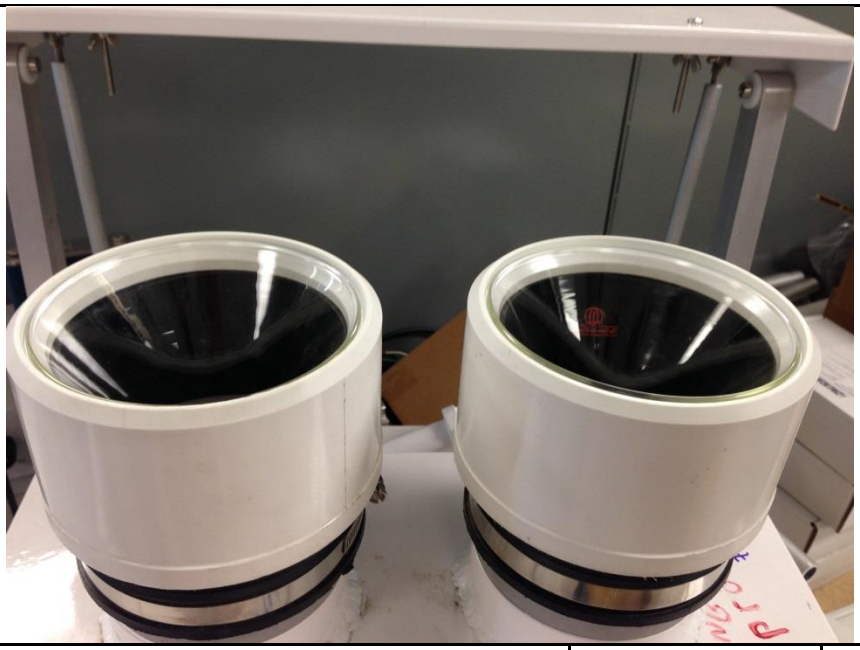
Step	Instructions	Requirement Reference	Notes/Results
1	Ensure unit as installed is level within 2° by measuring the body of the sensor, the mounting post, and across the top of the two inlet stacks.	NEON.TIS.4.1757	
2	Photo document the entire assembly showing that it is accessible for maintenance.	[-]	
3	Verify (and if possible, document) that a bulk precipitation gauge is located within 500m horizontally of the wet deposition collector	NEON.TIS.4.1762	Pass / Fail
4	Verify that the inlet of the wet deposition collector is not in the rain shadow of any structure.	NADP.TIS.4.1758	Pass / Fail
5	Verify that the inlet of the wet deposition collector is not located downwind (in the prevailing wind direction) of any air exhaust port or fan.	NADP.TIS.6.1163	Pass / Fail
6	Locate and document any obstacles to the wet deposition collector. An obstacle is defined as an object seen from the inlet with an angular width of ≥ 10° horizontally viewed from the top of the inlet	NADP.TIS.5.1514	
7	Ensure that any obstacle is at least 2X as far from the wet deposition collector, where X is the height of the highest part of the obstacle above the inlet of the wet deposition collector. Photograph any obstacle that does not meet the minimum distance requirement	NADP.TIS.5.1514	Pass / Fail
2	Inside the chamber of the collector ensure that there are two glass bottles, each with a thistle and funnel, assembled as shown in the figure below** 	[-]	Pass / Fail **During initial Phase 3 installations, the glass bottles may not be present. They will not be available until the process for collecting, storing and testing samples has been completed

4.4 Sensor Configuration Verification

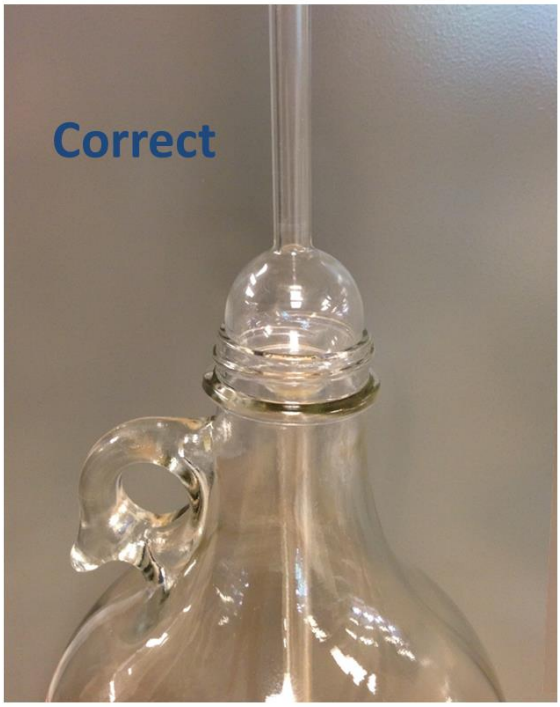
Step	Instructions	Requirement Reference	Notes/Results
1	After checking to ensure that the wet deposition collector is plugged in, open the chamber cover and locate the on/off switch on the left side of the chamber. Ensure the switch is in the "On" position, and that the green LED labeled "System On" is illuminated.	[-]	Pass / Fail
3	Pull the XML sensor file using the ***SESATRetrieve All XML.exe*** application. These steps are detailed in the XML configuration procedure document. Verify that the data stream ID matches the Maximo ID from the manifest (as recorded in the previous step).	[-]	WDC Data Stream ID: PRT Data Stream ID:
4	Verify chamber temperature, lid status, and heater status is being polled. These will be separate data streams in the XML, reported as level 0 data. Temperature Voltage Data Range approx.	NADP.TIS.5.1515	Pass / Fail
5	Verify calibration coefficients are listed near the top of the XML file for the PRT.	[-]	Pass / Fail
6	Collect 4 minutes of continuous data from the sensor using the stream capture procedure. (Note: Estimated minimum sample size at 95% confidence for accuracy and precision meeting requirements is 68 samples for a statistically significant collection. Due to NADP.TIS. ongoing testing of actual sampling error, 3x is deemed necessary.)	[-]	
7	While collecting data, locate the precipitation sensor (Item 10 in RD[04]). Verify that the lid opens when an object is passed through the precipitation sensor five times. Watch the data monitor to ensure that a status is sent when the lid begins to open.	NADP.DCS.3.1683 NADP.TIS.4.1754	Pass / Fail Time:_____
8	While collecting data, verify that the lid begins to close after 25 +/- 2 seconds of inactivity. Watch the data monitor to ensure that a status is sent when the lid begins to open.	NADP.TIS.4.1755	Pass / Fail Time:_____
9	Open the front cover of the collection chamber. While collecting data, turn the knob on the chiller (shown in the picture below) to a temperature at least 3 degrees below the approximate ambient temperature. Verify that the chiller turns on, and record the time when it does. Return the chiller knob to a setting of 24°C	NADP.TIS.4.1755 NADP.TIS.5.1506	Pass / Fail Time:_____

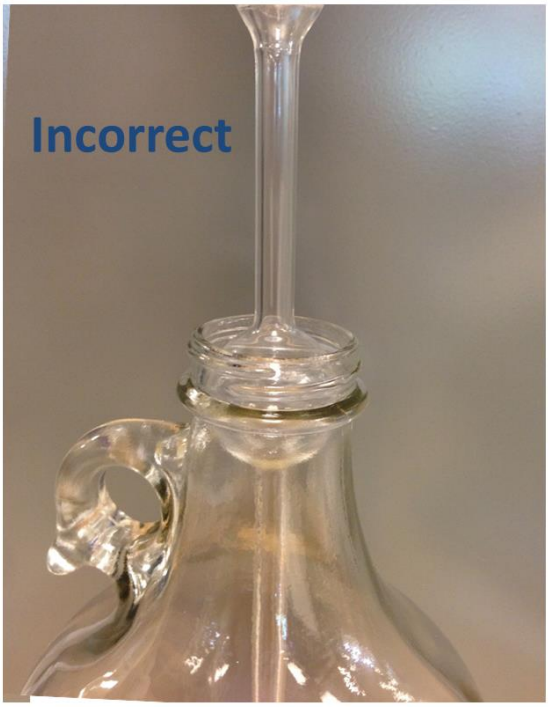
			
10	While collecting data, turn the knob on the heater to a temperature at least 3 degrees above the approximate ambient temperature. Verify that the heater turns on, and record the time when it does. Return the heater knob to a setting of 4°C 	NADP.TIS.4.1755 NADP.TIS.5.1506	Pass / Fail Time:_____
11	After at least 4 minutes of data collection, pass an object through the precipitation sensor several times	NADP.DCS.3.1683 NADP.TIS.4.1754	

	to open the lid. Once the lid is open, flip the power switch to the "Off" position so the lid remains open.		
12	Locate the funnel (shown in the diagram below) and lift upward to verify that the blue clip is visible and straddles the top lip of the thistle tube. Ensure that it rests fully on the inside lip of the chimney.  	[-]	Pass / Fail
13	Replace the funnel and thistle. Verify that the funnel rests fully on the inside lip of the chimney as shown in the image below. If the funnel is too high, lower the support tray underneath the bottle by rotating it in a clockwise direction until the funnel rests on the lip. This verification fails if the funnel cannot be brought to rest on the lip.	[-]	Pass / Fail



14	Inside the chamber, look at the mouth of the glass bottle. The spherical portion of the thistle tube should rest on the mouth of the bottle as shown in the image below on the left. If the sphere is too small for the opening it will fall into the bottle, as shown on the right. In this case, the mismatch must be reported back to headquarters so the thistle can be replaced.	[-]	Pass / Fail





16	After completing all checks, return the power switch to the “On” position and ensure the lid returns to a closed position to protect the chimneys.	[-]	
17	Close and secure the door to the chamber, making sure to latch the toggles on both the right side and the bottom of the door.	[-]	