2018 – 4th Quarter Report

Support for Conducting Systems & Performance Audits of Clean Air Status and Trends Network (CASTNET) Sites and National Atmospheric Deposition Program (NADP) Monitoring Stations - II

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Prepared for:

U. S. Environmental Protection Agency

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List of Acronyms and Abbreviations

% diff	percent difference
A/D	analog to digital converter
ARS	Air Resource Specialist, Inc.
ASTM	American Society for Testing and Materials
BLM	Bureau of Land Management
CASTNET	Clean Air Status and Trends Network
CMAQ	Community Multiscale Air Quality
DAS	data acquisition system
DC	direct current
deg	degree
DVM	digital voltmeter
ECCC	Environment and Climate Change Canada
EEMS	Environmental, Engineering & Measurement Services, Inc.
EPA	U.S. Environmental Protection Agency
ESC	Environmental Systems Corporation
FSA	Field Systems Audit
FSAD	Field Site Audit Database
GPS	geographical positioning system
lpm	liters per minute
MLM	Multilayer Model
m/s	meters per second
mv	millivolt
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
PE	Performance Evaluation
QAPP	Quality Assurance Project Plan
SOP	standard operating procedure
TDEP	Total Deposition
TEI	Thermo Environmental Instruments
USNO	United States Naval Observatory
V	volts
WRR	World Radiation Reference
WSO	Wyoming State Office

1.0 CASTNET Quarterly Report

1.1 Introduction

The Clean Air Status and Trends Network (CASTNET) is a national air monitoring program developed under mandate of the 1990 Clean Air Act Amendments. Each site in the network measures acidic gases and particles and other forms of atmospheric pollution using a continuous collection filter aggregated over a one week period. Hourly averages of surface ozone concentrations and selected meteorological variables are also measured.

Site measurements are used to estimate deposition rates of the various pollutants with the objective of determining relationships between emissions, air quality, deposition, and ecological effects. In conjunction with other national monitoring networks, CASTNET data are used to determine the effectiveness of national emissions control programs and to assess temporal trends and spatial deposition patterns in atmospheric pollutants. CASTNET data are also used for long-range transport model evaluations and effects research.

CASTNET pollutant flux estimates are calculated as the aggregate product of weekly measured chemical concentrations and model-estimated deposition velocities. Total deposition is assessed using the NADP's Total Deposition Hybrid Method (TDEP; EPA, 2015c; Schwede and Lear, 2014), which combines data from established ambient monitoring networks and chemical-transport models. To estimate dry deposition, ambient measurement data from CASTNET and other networks were merged with dry deposition rates and flux output from the Community Multiscale Air Quality (CMAQ) modeling system.

As of December 2018, the network is comprised of 95 active rural sampling sites across the United States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment and Climate Change Canada (ECCC), Bureau of Land Management – Wyoming State Office (BLM-WSO) and several independent partners. Wood is responsible for operating the EPA and ECCC sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS and BLM-WSO sponsored sites.

1.2 Project Objectives

The objectives of this project are to establish an independent and unbiased program of performance and systems audits for all CASTNET sampling sites. Ongoing Quality Assurance (QA) programs are an essential part of any long-term monitoring network.

Performance audits verify that all evaluated variables are consistent with the accuracy goals as defined in the CASTNET Quality Assurance Project Plan (QAPP). The parameter specific accuracy goals are presented in Table 1. Two EPA sponsored sites that are operated by Wood continue to operate meteorological sensors. Those sites are BEL116 and BVL130. PND165 and four sites sponsored by BLM-WSO also operate meteorological sensors. The NPS operates meteorological sensors at many of their air quality monitoring sites. The meteorological sensors at one NPS CASTNET site (ACA416) and one EPA site (BEL116) were audited during this reporting period.

Some or all of the additional monitored variables, NOy, CO, and SO_2 have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, GRS420, MAC426, and ROM206. Those variables at sites BVL130, MAC426, GRS420, and PNF126 were audited during this reporting period. Results of those audits were distributed immediately following the performance evaluations.

Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Precipitation	Response	10 manual tips	1 DAS count per tip
Precipitation	Accuracy	2 introductions of known amounts of water	≤ ±10.0% of input amount
Relative Humidity	Accuracy	Compared to reference instrument or standard solution	≤ ±10.0% RH
Solar Radiation	Accuracy	Compared to WRR traceable standard	≤ ±10.0% of daytime average
Surface Wetness	Response	Distilled water spray mist	Positive response
Surface Wetness	Sensitivity	1% decade resistance	N/A
Temperature	Accuracy	Comparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)	≤ ± 0.5° C
Temperature Difference	Accuracy	Comparison to station temperature sensor	≤ ± 0.50° C
Shelter Temperature	Accuracy	Comparison to station temperature sensor	≤ ± 2.0° C
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	≤ ±5° from degrees true
Wind Direction	Linearity	Eight cardinal points on test fixture	≤ ±5° mean absolute error

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	≤ ±0.5 mps below 5.0 mps input; ≤ ±5.0% of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	≤ ± 5.0% of designated rate
Ozone	Slope	Linear regression of multi-point test gas concentration as measured with a certified transfer standard	0.9000 ≤ m ≤ 1.1000
Ozone	Intercept		-5.0 ppb ≤ b ≤ 5.0 ppb
Ozone	Correlation Coefficient		0.9950 ≤ r
Ozone	Percent Difference	Comparison with Level 2 standard concentration	≤ ±15.1% of test gas concentration
DAS	Accuracy	Comparison with certified standard	≤ ± 0.003 VDC

Performance audits are conducted using standards that are traceable to the National Institute of Standards and Technology (NIST), or another authoritative organization, and certified as current.

Site systems audits are intended to provide a qualitative appraisal of the total measurement system. Site planning, organization, and operation are evaluated to ensure that good Quality Assurance/Quality Control (QA/QC) practices are being applied. At a minimum the following audit issues were addressed at each site systems audit:

- Site locations and configurations match those provided in the CASTNET QAPP.
- Meteorological instruments are in good physical and operational condition and are sited to meet EPA ambient monitoring guidelines (EPA-600/4-82-060).
- Sites are accessible, orderly, and if applicable, compliant with OSHA safety standards.
- Sampling lines are free of leaks, kinks, visible contamination, weathering, and moisture.
- Site shelters provide adequate temperature control.
- All ambient air quality instruments are functional, being operated in the appropriate range, and the zero air supply desiccant is unsaturated.
- All instruments are in current calibration.
- Site documentation (maintenance schedules, on-site SOPs, etc.) is current and log book records are complete.
- All maintenance and on-site SOPs are performed on schedule.

- Corrective actions are documented and appropriate for required maintenance/repair activity.
- Site operators demonstrate an adequate knowledge and ability to perform required site activities, including documentation and maintenance activities.

1.3 CASTNET Sites Visited Fourth Quarter 2018

This report consists of the systems and performance and other audit results from the CASTNET sites visited during the fourth quarter (October through December) of 2018. The locations and dates of the site visits for complete audits are presented in Table 2.

Table 2. Site Audit Visits

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
HWF187	FSA	EPA	10/1/2018	Huntington Wildlife Forest
HOW191	FSA	EPA	10/2/2018	Howland
HOW191	O_3 PE	EPA	10/2/2018	Howland
HOW191	Flow	EPA	10/2/2018	Howland
ACA416	MET	NPS / ME DEP	10/3/2018	Acadia NP
ACA416	O_3 PE	NPS / ME DEP	10/3/2018	Acadia NP
ASH135	FSA	EPA	10/4/2018	Ashland
ASH135	O_3 PE	EPA	10/4/2018	Ashland
ASH135	Flow	EPA	10/4/2018	Ashland
WST109	FSA	EPA	10/9/2018	Woodstock
WST109	O_3 PE	EPA	10/9/2018	Woodstock
WST109	Flow	EPA	10/9/2018	Woodstock
DEN417	FSA	NPS	10/10/2018	Denali NP
DEN417	O_3 PE	NPS	10/10/2018	Denali NP

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
DEN417	Flow	NPS	10/10/2018	Denali NP
RED004	FSA	EPA	10/22/2018	Red Lake Nation
RED004	Flow	EPA	10/22/2018	Red Lake Nation
SAL133	FSA	EPA	10/27/2018	Salamonie Reservoir
SAL133	O_3 PE	EPA	10/27/2018	Salamonie Reservoir
SAL133	Flow	EPA	10/27/2018	Salamonie Reservoir
CAT175	FSA	EPA	11/7/2018	Claryville
CAT175	Flow	EPA	11/7/2018	Claryville
ABT147	FSA	EPA	11/8/2018	Abington
ABT147	O_3 PE	EPA	11/8/2018	Abington
ABT147	Flow	EPA	11/8/2018	Abington
PNF126	FSA	EPA	11/15/2018	Cranberry
PNF126	O_3 PE	EPA	11/15/2018	Cranberry
PNF126	Flow	EPA	11/15/2018	Cranberry
BEL116	FSA	EPA	11/17/2018	Beltsville
BEL116	O_3 PE	EPA	11/17/2018	Beltsville
BEL116	Flow	EPA	11/17/2018	Beltsville
BEL116	Met	EPA	11/17/2018	Beltsville
DUK008	FSA	EPA	12/5/2018	Duke Forest
DUK008	Flow	EPA	12/5/2018	Duke Forest
COW137	FSA	EPA	12/7/2018	Coweeta

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
COW137	O_3 PE	EPA	12/7/2018	Coweeta
COW137	Flow	EPA	12/7/2018	Coweeta

In addition to the sites listed in Table 2 that were visited for complete audits, the sites listed in Table 3 were visited to conduct Through-The-Probe (TTP) pollutant Performance Evaluations (PE). One site (LRL117) was visited twice to confirm the TTP results. Only one TTP audit (11/10) was entered into AQS.

Table 3. TTP Pollutant PE Visits

Side ID	PE Audit Type	Sponsor	Site Visit Date	Station Name
VIN140	O_3	EPA	10/18/2018	Vincennes
ALH157	O_3	EPA	10/19/2018	Alhambra
LRL117	O_3	EPA	10/19/2018	Laurel Hill St. Park
STK138	O_3	EPA	10/20/2018	Stockton
VOY413	O_3	NPS	10/23/2018	Voyageurs NP
SAN189	O_3	EPA	10/26/2018	Santee Sioux
OXF122	O_3	EPA	10/28/2018	Oxford
LRL117	O_3	EPA	11/10/2018	Laurel Hill St. Park
BVL130	O_3	EPA	11/11/2018	Bondville
BVL130	SO_2	EPA	11/11/2018	Bondville
BVL130	CO	EPA	11/11/2018	Bondville
BVL130	NOy	EPA	11/11/2018	Bondville
MAC426	O_3	NPS	11/13/2018	Mammoth Cave NP

Side ID	PE Audit Type	Sponsor	Site Visit Date	Station Name
MAC426	NOy	NPS	11/13/2018	Mammoth Cave NP
DCP114	O_3	EPA	11/14/2018	Deer Creek St. Park
GRS420	NOy	NPS	11/14/2018	Great Smoky Mountains NP - Look Rock
GRS420	O_3	NPS	11/14/2018	Great Smoky Mountains NP - Look Rock
PNF126	NOy	EPA	11/15/2018	Cranberry
BWR139	O_3	EPA	11/16/2018	Blackwater NWR
SHN418	O_3	NPS	11/19/2018	Shenandoah NP - Big Meadows
WSP144	O_3	EPA	12/1/2018	Washington Crossing
QAK172	O_3	EPA	12/4/2018	Quaker City
CND125	O_3	EPA	12/5/2018	Candor

1.4 Audit Results

The observations and results of the systems and performance audits are included in Appendix A, *CASTNET Audit Report Forms* by site, arranged by audit date. Photographs of site conditions are included within each systems report where necessary. Copies of the spot reports that were sent immediately following the audit of each site are included as Appendix B, *CASTNET Site Spot Report Forms*. The Ozone PE results and observations are included in Appendix C, *CASTNET Ozone Performance Evaluation Forms.*

2.0 NADP Quarterly Report

2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates three precipitation chemistry networks and two atmospheric concentration networks. The National Trends Network (NTN) has been measuring acidic precipitation since 1978. The network currently has more than 250 sites. The Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992 and currently measures event based precipitation events at 3 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 120 stations. The MDN began operation in 1996 and includes sites throughout the US and Canada. The Atmospheric Mercury Network (AMNet) and the Ammonia Monitoring Network (AMoN) measure ambient concentrations of mercury and ammonia, respectively.

The NADP and other long-term monitoring networks provide critical information to the EPA regarding evaluating the effectiveness of emission reduction control programs from the power industry.

The NADP Program Office (PO) operates and administers the three precipitation chemistry networks (NTN, MDN and AIRMoN), two atmospheric concentration networks (AMNet and AMoN), two analytical laboratories, the Wisconsin State Lab of Hygiene (WSLH) located at the University of Wisconsin in Madison and the Mercury Analytical Laboratory (HAL) located at Frontier Global Sciences), and the network equipment depot (NED).

2.2 Project Objectives

The objective of this project is to perform independent and unbiased evaluations of the sites along with its operations. These evaluations provide quality assurance pertaining to siting, sample collection and handling, equipment operation and maintenance, record keeping and field laboratory procedures.

More specifically, the surveys determine and report findings based on an established methodology consisting of completing a site questionnaire, testing the equipment and documenting with photographs the location, siting criteria, existing equipment, and any issues encountered that require such documentation.

2.3 NADP Sites Visited Fourth Quarter 2018

This report presents the NADP sites surveyed during the fourth quarter (October through December) of 2018. The station names and dates of the surveys are presented in Table 4.

Table 4. Sites Surveyed – Fourth Quarter 2018

Side ID	Network	Visit Date	Station Name
NY20	AMoN	10/1/2018	Huntington Wildlife
AK96	MDN/NTN	10/8/2018	Toolik Field Station
AK02	NTN	10/12/2018	Juneau
AK98	MDN	10/13/2018	Kodiak
BC23	NTN	10/15/2018	Lakelse Lake
BC24	NTN	10/15/2018	Port Edward
BC22	NTN	10/16/2018	Haul Road Station
IN22	AMoN	10/18/2018	Southwest Purdue Agriculture Center
IL46	AMoN	10/19/2018	Alhambra
IL37	AMoN	10/20/2018	Stockton
MN06	MDN	10/24/2018	Leech Lake
IN34	MDN	10/26/2018	Indiana Dunes National Lakeshore
NE98	MDN/AMoN	10/26/2018	Santee
IN20	AMoN	10/27/2018	Roush Lake
OH09	AMoN	10/28/2018	Oxford
NY98	AMoN	11/4/2018	Whiteface Mountain
SD08	NTN	11/5/2018	Cottonwood
NY91	AMoN	11/7/2018	Claryville
CT15	AMoN	11/8/2018	Abington
PA97	AMoN	11/10/2018	Laurel Hill
IL11	AMoN	11/11/2018	Bondville
OH02	MDN/AMoN	11/12/2018	Athens Super Site
CO01	NTN	11/13/2018	Las Animas Fish Hatchery

Side ID	Network	Visit Date	Station Name
OH16	MDN	11/13/2018	Northeast Ohio Regional Sewer District
OH52	MDN	11/13/2018	South Bass Island
CO21	NTN	11/14/2018	Manitou
OH17	NTN	11/14/2018	Delaware
OH54	AMoN	11/14/2018	Deer Creek State Park
CO00	NTN	11/15/2018	Alamosa
NC02	AMoN	11/15/2018	Cranberry
MD06	AMoN	11/16/2018	Blackwater NWR
MD99	AMoN	11/20/2018	Beltsville
NJ98	AMoN	12/1/2018	Washington Crossing
OH99	AMoN	12/4/2018	Quaker City
IN21	MDN	12/5/2018	City Falls State Park
NC26	AMoN	12/5/2018	Candor
NC30	AMoN	12/5/2018	Duke Forest
NC25	NTN / AMoN	12/6/2018	Coweeta

2.4 Survey Results

Site survey results are entered into a relational database. The database in turn generates Site Spot Reports which are distributed among the interested parties as soon as all the site data has been entered. Database tables with all the data collected and reviewed are then sent to the NADP Program Office and to the U.S. EPA Project Officers.

Other items gathered during the surveys (i.e., photographs, Belfort charts, etc.) are uploaded to EEMS' server where the NADP PO and the U.S. EPA POs can access them and download them as needed by login into the server site.

Given the volume of data generated, and the fact that data is distributed and/or is available through EEMS' server, no survey results are included in this report.

APPENDIX A

CASTNET Audit Report Forms

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
HOW191-Eric Hebert-10/02/2018						
1	10/2/2018	DAS	Campbell	000419	CR3000	2527
2	10/2/2018	elevation	Elevation	none	none	none
3	10/2/2018	Filter pack flow pump	Thomas	06021	107CAB18B	060400022648
4	10/2/2018	Flow Rate	Apex	000645	AXMC105LPMDPCV	illegible
5	10/2/2018	Infrastructure	Infrastructure	none	none	none
6	10/2/2018	Modem	Raven	06470	H4222-C	0808311250
7	10/2/2018	Ozone	ThermoElectron Inc	000616	49i A1NAA	1009241781
8	10/2/2018	Ozone Standard	ThermoElectron Inc	000372	49i A3NAA	0726124684
9	10/2/2018	Shelter Temperature	Campbell	none	107-L	none
10	10/2/2018	siting criteria	Siting Criteria	none	none	None
11	10/2/2018	Temperature	RM Young	missing	41342	missing
12	10/2/2018	Zero air pump	Werther International	06908	C 70/4	000821900

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2527	HOW191	Eric Hebert	10/02/2018	DAS	Primary

Das Date: 10/2 /2018 **Audit Date** 10/2 /2018
Das Time: 12:05:29 **Audit Time** 12:05:30
Das Day: 275 **Audit Day** 275

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0001	0.0001	0.0001

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/24/2018	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.1000	V	V	0.0001
7	0.3000	0.3000	0.2999	V	V	-0.0001
7	0.5000	0.5000	0.4999	V	V	-0.0001
7	0.7000	0.6999	0.6999	V	V	0.0000
7	0.9000	0.8999	0.8999	V	V	0.0000
7	1.0000	1.0000	0.9999	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	HOW191	Eric Hebert	10/02/2018	Flow Rate	000645

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.03
0.00%	0.00%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	0

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.000	-0.01	l/m	l/m	
primary	test pt 1	1.530	1.530	1.53	0.000	1.53	l/m	l/m	0.00%
primary	test pt 2	1.532	1.530	1.53	0.000	1.53	l/m	l/m	0.00%
primary	test pt 3	1.534	1.530	1.53	0.000	1.53	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	N/A	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241781	HOW191	Eric Hebert	10/02/2018	Ozone	000616

Slope:	0.97614	**Slope:**	0.00000
Intercept	-0.04959	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.79	0.71	0.30	ppb		-0.41
primary	2	16.38	16.25	16.01	ppb		-0.24
primary	3	35.12	34.93	34.25	ppb	-1.97	
primary	4	68.36	68.07	66.48	ppb	-2.36	
primary	5	112.29	111.86	109.00	ppb	-2.59	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.20	pass
Span	1.007	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	80.1 kHz	pass
Cell A Noise	11.0 ppb	Fail
Cell A Flow	0.71 lpm	pass
Cell A Pressure	707.7 mmHg	pass
Cell A Tmp.	33.0 C	pass
Cell B Freq.	80.9 kHz	pass
Cell B Noise	6.8 ppb	Fail
Cell B Flow	0.70 lpm	pass
Cell B Pressure	708.0 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	missing	HOW191	Eric Hebert	10/02/2018	Temperature	missing

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00757	**Intercept**	-0.09210
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.03	0.07		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.01	0.10	0.000	0.1	C	0
primary	Temp Mid Range	26.00	25.90	0.000	26.0	C	0.07
primary	Temp High Range	48.39	48.12	0.000	48.1	C	-0.03

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	HOW191	Eric Hebert	10/02/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.77	1.03		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00757	Intercept	-0.09210
Cert Date	2/13/2018	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.47	24.38	0.000	24.9	C	0.49
primary	Temp Mid Range	23.94	23.85	0.000	24.9	C	1.03
primary	Temp Mid Range	24.46	24.37	0.000	25.2	C	0.8

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	HOW191	Technician	Eric Hebert	Site Visit Date	10/02/2018

Shelter Make	Shelter Model	Shelter Size
custom	custom	800 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Other	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Not installed	Status	Fail
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	1/4 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	HOW191	Eric Hebert	10/02/2018	Cell B Noise	ThermoElectron	3597	☐	☐
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Ozone	HOW191	Eric Hebert	10/02/2018	Cell A Noise	ThermoElectron	3597	☐	☐
This analyzer diagnostic check is outside the manufacturer's recommended value.								

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator reported that gloves are not consistently used to handle the filter pack.

2 **Parameter:** SitingCriteriaCom

The CASTNET filter pack at this location is located above a tree canopy at approximately 23.5 meters from the ground. This is an AmeriFlux site which is approximately 2.5 km to the SW of the HOW132 CASTNET site.

3 **Parameter:** ShelterCleanNotes

The custom built shelter is clean and organized.

4 **Parameter:** MetSensorComme

Other than a temperature sensor located at the CASTNET filter location the meteorological instrumentation is being operated by the University of Maine and AmeriFlux.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	HOW191	**Technician**	Eric Hebert	**Site Visit Date**	10/02/2018

Site Sponsor (agency)	EPA	**USGS Map**	Howland
Operating Group	University of ME	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	Woodland - mixed	**QAPP Elevation Meters**	
Terrain	flat, gently rolling	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	45.203963
Site Address 1		**Audit Longitude**	-68.740041
Site Address 2		**Audit Elevation**	68
County	Penobscot	**Audit Declination**	-17
City, State	Howland, ME		
Zip Code			**Present**
Time Zone	Eastern	**Fire Extinguisher** ☑	New in 2015
Primary Operator		**First Aid Kit** ☑	
Primary Op. Phone #		**Safety Glasses** ☐	
Primary Op. E-mail		**Safety Hard Hat** ☑	
Backup Operator		**Climbing Belt** ☑	
Backup Op. Phone #		**Security Fence** ☐	
Backup Op. E-mail		**Secure Shelter** ☑	
		Stable Entry Step ☑	

Shelter Working Room ☑ **Make** custom **Model** custom **Shelter Size** 800 cuft

Shelter Clean ☑ **Notes** The custom built shelter is clean and organized.

Site OK ☑ **Notes**

Driving Directions Arrange for site visit and access with the site operator.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/02/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The CASTNET filter pack at this location is located above a tree canopy at approximately 23.5 meters from the ground. This is an AmeriFlux site which is approximately 2.5 km to the SW of the HOW132 CASTNET site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	HOW191	Technician	Eric Hebert	Site Visit Date	10/02/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Other than a temperature sensor located at the CASTNET filter location the meteorological instrumentation is being operated by the University of Maine and AmeriFlux.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/02/2018

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	Temperature only
2	**Are all the meteorological sensors operational online, and reporting data?**	☑	Temperature only
3	**Are the shields for the temperature and RH sensors clean?**	☑	
4	**Are the aspirated motors working?**	☑	N/A
5	**Is the solar radiation sensor's lens clean and free of scratches?**	☑	N/A
6	**Is the surface wetness sensor grid clean and undamaged?**	☑	N/A
7	**Are the sensor signal and power cables intact, in good condition, and well maintained?**	☑	
8	**Are the sensor signal and power cable connections protected from the elements and well maintained?**	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	HOW191	Technician	Eric Hebert	Site Visit Date	10/02/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	23.5 meters above ground
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	Above canopy

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 40 meters
4	Describe dry dep sample tube.		1/4 teflon by 40 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/02/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?	24 meter walk-up tower	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	HOW191	Technician	Eric Hebert	Site Visit Date	10/02/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☐	☑	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☐	☑	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☐	☑	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☐	☑	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☐	☑	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☐		☐
HASP	☑		☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	HOW191	Technician	Eric Hebert	Site Visit Date	10/02/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☐
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☐	N/A	☐
Sample Line Check for Dirt/Water	☑	Weekly	☐
Zero Air Desiccant Check	☑	Weekly	☐

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, call-in

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/02/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The site operator reported that gloves are not consistently used to handle the filter pack.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID HOW191 **Technician** Eric Hebert **Site Visit Date** 10/02/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR3000	2527	000419
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CAB18B	060400022648	06021
Flow Rate	Apex	AXMC105LPMDPC	illegible	000645
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0808311250	06470
Ozone	ThermoElectron Inc	49i A1NAA	1009241781	000616
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124684	000372
Shelter Temperature	Campbell	107-L	none	none
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342	missing	missing
Zero air pump	Werther International	C 70/4	000821900	06908

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ACA416-Eric Hebert-10/03/2018						
1	10/3/2018	Computer	Hewlett Packard	none	8460p	CNU20941M6
2	10/3/2018	DAS	Environmental Sys Corp	none	8832	A3506K
3	10/3/2018	Elevation	Elevation	None	1	None
4	10/3/2018	F460 translator	Climatronics	none	100163	683
5	10/3/2018	Infrastructure	Infrastructure	none	none	none
6	10/3/2018	Mainframe	Climatronics	01342	100081	1288
7	10/3/2018	Met tower	Climatronics	none	unknown	illegible
8	10/3/2018	Ozone	ThermoElectron Inc	90744	49C	49C-74536-376
9	10/3/2018	Ozone Standard	ThermoElectron Inc	none	49i PSA2AB	1009941498
10	10/3/2018	Precipitation	Climatronics	01322	100508-2	illegible
11	10/3/2018	Relative Humidity	Rotronic	none	MP 601A	67857
12	10/3/2018	Sample Tower	Aluma Tower	none	B	AT-71103-7I-3
13	10/3/2018	Shelter Temperature	Agilaire	none	Unknown	None
14	10/3/2018	Shield (2 meter)	Climatronics	none	100325	illegible
15	10/3/2018	Siting Criteria	Siting Criteria	None	1	None
16	10/3/2018	Solar Radiation	Licor	none	LI-200	PY16746
17	10/3/2018	Temperature Translator	Climatronics	03630	100088-2	401
18	10/3/2018	Wind Direction	Climatronics	none	100076	illegible
19	10/3/2018	Wind Speed	Climatronics	none	100075	illegible
20	10/3/2018	Zero air pump	ThermoElectron Inc	none	111	111-30215-237

DAS Data Form

DAS Time Max Error: 1.33

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A3506K	ACA416	Eric Hebert	10/03/2018	DAS	Primary

Das Date: 10/3 /2018
Das Time: 8:30:00
Das Day: 276

Audit Date 10/3 /2018
Audit Time 8:31:20
Audit Day 276

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0003	0.0004	0.0003	0.0004

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/24/2018	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
13	0.0000	0.0000	0.0000	V	V	0.0000
13	0.1000	0.1000	0.0997	V	V	-0.0003
13	0.3000	0.3000	0.2997	V	V	-0.0003
13	0.5000	0.5000	0.4998	V	V	-0.0002
13	0.7000	0.7001	0.6997	V	V	-0.0004
13	0.9000	0.9001	0.8997	V	V	-0.0004
13	1.0000	1.0001	0.9997	V	V	-0.0004

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-74536-376	ACA416	Eric Hebert	10/03/2018	Ozone	90744

Slope:	1.05148	**Slope:**	0.00000
Intercept	0.62233	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.43	-0.50	0.11	ppb		0.61
primary	2	14.55	14.43	15.58	ppb		1.15
primary	3	35.48	35.29	37.93	ppb	7.21	
primary	4	69.96	69.66	73.97	ppb	6	
primary	5	109.97	109.54	115.70	ppb	5.47	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.1	pass
Span	1.096	pass
Zero Voltage	-0.0004	pass
Fullscale Voltage	10.0000	pass
Cell A Freq.	73.6 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	739.0 mmHg	pass
Cell A Tmp.	36.3 C	pass
Cell B Freq.	78.2 kHz	pass
Cell B Noise	0.4 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	738.5 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	Pass
System Memo		pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	ACA416	Eric Hebert	10/03/2018	Wind Speed	none

Mfg	Climatronics		
SN/Owner ID	683	none	
Parameter	F460 translator		

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA04013	**Tfer Desc.**	wind speed motor (h
Tfer ID	01253		
Slope	1.00000	**Intercept**	0.00000
Cert Date	7/11/2018	**CorrCoff**	1.00000

Prop or Cups SN	22003			
Prop or Cups Torque	0.2	**to**	0.2	
Prop Correction Fact	N/A			

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.32	8.25%		
Abs Max Er	0.56	26.24%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.0		-0.18	
primary	01253	50	1.40	0.0	2.0		0.56	
primary	01253	100	2.57	0.0	2.9		0.36	
primary	01253	170	4.22	0.0	4.0		-0.18	
primary	01253	250	6.10	0.0	5.9	-2.72%		
primary	01253	500	11.97	0.0	12.4	3.76%		
primary	01253	800	19.02	0.0	19.0	-0.26%		
primary	01253	2000	47.22	0.0	34.8	-26.24%		

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	Unable to test	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	ACA416	Eric Hebert	10/03/2018	Wind Direction	none

Mfg	Climatronics	
SN/Owner ID	683	none
Parameter	F460 translator	

Vane SN: 1491 C. A. Align. deg. true: 1

VaneTorque 5 to 12

Mfg	RM Young	Parameter	wind direction	
Serial Number	None	Tfer Desc.	wind direction wheel	
Tfer ID	01252			
Slope	1.00000	Intercept	0.00000	
Cert Date	4/26/2013	CorrCoff	1.00000	
Mfg	Ushikata	Parameter	wind direction	
Serial Number	191832	Tfer Desc.	transit	
Tfer ID	01272			
Slope	1.00000	Intercept	0.00000	
Cert Date	5/10/2018	CorrCoff	1.00000	

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	3.8	1.9		
Abs Max Er	6	6		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01252	0	☑	0.0000	357	3	46.2	##########
primary	01252	45	☑	0.0000	38	7	40.9	##########
primary	01252	90	☑	0.0000	84	6	45.4	##########
primary	01252	135	☑	0.0000	127	8	43.6	##########
primary	01252	180	☑	0.0000	178	2	50.6	##########
primary	01252	225	☑	0.0000	221	4	43.7	##########
primary	01252	270	☑	0.0000	266	4	44.3	##########
primary	01252	315	☑	0.0000	311	4	45.3	##########
primary	01272	90	☐	0.0000	84	6		6
primary	01272	180	☐	0.0000	178	2		2
primary	01272	270	☐	0.0000	266	4		4
primary	01272	360	☐	0.0000	357	3		3

Sensor Component		Condition		Status	
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Mast	Condition	Good	Status	pass
Sensor Component	Sensor Heater	Condition	Unable to test	Status	pass
Sensor Component	Sensor Plumb	Condition	Plumb	Status	pass
Sensor Component	Torque	Condition		Status	pass
Sensor Component	Vane Condition	Condition	Good	Status	pass
Sensor Component	System Memo	Condition		Status	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	missing	ACA416	Eric Hebert	10/03/2018	Temperature2meter	none

Mfg	Climatronics
SN/Owner ID	401 03630
Parameter	Temperature Translator

Mfg	Extech	Parameter	Temperature
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00757	Intercept	-0.09210
Cert Date	2/13/2018	CorrCoff	1.00000

DAS 1: Abs Avg Err	DAS 1: Abs Max Er	DAS 2: Abs Avg Err	DAS 2: Abs Max Er
0.14	0.26		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	-0.06	0.03	0.0000	0.05	C	0.02
primary	Temp Mid Rang	26.79	26.68	0.0000	26.42	C	-0.26
primary	Temp High Rang	49.28	49.00	0.0000	49.13	C	0.13

Sensor Component		Condition		Status	
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	Blower Status Switch	Condition	N/A	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY16746	ACA416	Eric Hebert	10/03/2018	Solar Radiation	none

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	10765	**Tfer Desc.**	SR transfer translat
Tfer ID	01246		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/14/2018	**CorrCoff**	1.00000

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	34341F3	**Tfer Desc.**	SR transfer sensor
Tfer ID	01245		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
0.8%	2.7%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	10/3/2018	11:00	318	318	323	1.5%
primary	10/3/2018	12:00	332	332	343	3.4%
primary	10/3/2018	13:00	376	376	366	-2.7%
primary	10/3/2018	14:00	218	218	222	1.7%

Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Sensor Level	**Condition**	Level	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Rotronic	67857	ACA416	Eric Hebert	10/03/2018	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	1.00237	**Intercept**	-1.36077
Cert Date	10/3/2018	**CorrCoff**	0.99714

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	2.4			
Abs Max Er	3.7			

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	Hygroclip	32.8	32.5	32.8	0.0000	34.8	2.0
primary	RH Low Range	Hygroclip	52.9	49.8	52.9	0.0000	56.6	3.7
primary	RH Low Range	Hygroclip	75.3	75.0	75.3	0.0000	76.8	1.5

Sensor Component	RH Filter	**Condition**	Clean	**Status**	pass
Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	Functioning	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	illegible	ACA416	Eric Hebert	10/03/2018	Precipitation	01322

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
6.0%	6.0%		

Mfg	PMP	Parameter	Precipitation
Serial Number	None	Tfer Desc.	250ml graduate
Tfer ID	01249		
Slope	1.00000	Intercept	0.00000
Cert Date	4/26/2013	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	10 sec	5.00	4.70	mm	mm	ml	-6.0%
primary	test 2	231.5	2	10 sec	5.00	4.70	mm	mm	ml	-6.0%

Sensor Component		Condition		Status	
Sensor Component	Properly Sited	Condition	45 degree rule	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Not installed	Status	pass
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	Unable to test	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Agilaire	None	ACA416	Eric Hebert	10/03/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.28	0.39		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00757	Intercept	-0.09210
Cert Date	2/13/2018	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.44	24.35	0.000	24.4	C	0.05
primary	Temp Mid Range	24.48	24.39	0.000	24.0	C	-0.39
primary	Temp Mid Range	24.38	24.29	0.000	23.9	C	-0.39

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	10/03/2018

Shelter Make	Shelter Model	Shelter Size
Custom	Unknown	Unknown

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	N/A	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

This site is operated by both the NPS and the State of Maine DEP. It is not visited by ARS for semiannual calibration and maintenance visits. The site operator does not perform many of the routine checks conducted at other CASTNET sites, such as tip checks, wetness sensor tests, and visual checks of the blowers. The state of Maine personnel maintain the meteorological systems and the ozone monitor.

2 **Parameter:** SiteOpsProcedures

The meteorological and ozone instrument checks and maintenance are performed by the State of Maine DEP.

3 **Parameter:** ShelterCleanNotes

The shelter is new, clean and well organized.

4 **Parameter:** PollAnalyzerCom

New sample lines have been installed in the new shelter.

5 **Parameter:** MetSensorComme

The wind speed sensor response at the high speed test was much lower than expected. This condition has been observed during previous audits.

6 **Parameter:** MetOpMaintCom

The sensor signal cables are beginning to show signs of wear.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ACA416	**Technician**	Eric Hebert	**Site Visit Date**	10/03/2018

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Salsbury Cove
Operating Group	NPS/MEDEP	**Map Scale**	
AQS #	23-009-0103	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, SO2, NOx, NOy, PM, VOC	**QAPP Latitude**	44.3770
Deposition Measurement	dry, wet, Hg	**QAPP Longitude**	-68.2610
Land Use	Costal, woodland - mixed	**QAPP Elevation Meters**	158
Terrain	rolling	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(432) 288-9322	**Audit Latitude**	44.377086
Site Address 1	Route 233	**Audit Longitude**	-68.2608
Site Address 2		**Audit Elevation**	153
County	Hancock	**Audit Declination**	-16.4
City, State	Bar Harbor, ME		
Zip Code	04609	**Fire Extinguisher** ☑	Inspected Aug 2017
Time Zone	Eastern	**First Aid Kit** ☐	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Custom	**Model**	Unknown	**Shelter Size**	Unknown
Shelter Clean	☑	**Notes**	The shelter is new, clean and well organized.				
Site OK	☑	**Notes**					

Driving Directions From Bangor go east on 1A to Ellsworth. From Ellsworth take route 3 east to Bar Harbor. At the west edge of town, take Eagle Lake Rd (route 233) west toward Acadia National Park. The site is through a gate, at the end of a gravel road, across from the Park Headquarters.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/03/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	25 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	10/03/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	
3	Are the tower and sensors plumb?	☑	
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	
8	Is the rain gauge plumb?	☑	
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☐	45 degree rule violation
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	
11	Is it inclined approximately 30 degrees?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The wind speed sensor response at the high speed test was much lower than expected. This condition has been observed during previous audits.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/03/2018

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	
2	Are all the meteorological sensors operational online, and reporting data?	☑	
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	
6	Is the surface wetness sensor grid clean and undamaged?	☑	
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The sensor signal cables are beginning to show signs of wear.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	10/03/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		3/8 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

New sample lines have been installed in the new shelter.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/03/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?		

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/03/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☑	☐	Data logger	☑	☐	☐
Wind direction sensor	☐	☑	☐	Data logger	☐	☐	☑
Temperature sensor	☑	☐	☐	Strip chart recorder	☑	☐	☐
Relative humidity sensor	☐	☑	☐	Computer	☐	☑	☐
Solar radiation sensor	☑	☐	☐	Modem	☐	☑	☐
Surface wetness sensor	☐	☑	☐	Printer	☐	☑	☐
Wind sensor translator	☐	☑	☐	Zero air pump	☐	☑	☐
Temperature translator	☑	☐	☐	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☑	☐	Surge protector	☐	☑	☐
Solar radiation translator	☑	☐	☐	UPS	☐	☑	☐
Tipping bucket rain gauge	☑	☐	☐	Lightning protection device	☐	☑	☐
Ozone analyzer	☑	☐	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☐	☑	☐
Filter pack MFC power supply	☐	☑	☐				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑	June 2000	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☑		☑

1	Is the station log properly completed during every site visit?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/03/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained on-site by ARS during site installation
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	Operator procedures are very good for filter replacement
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually by MEDEP	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☑	Semiannually	☑
Manual Rain Gauge Test	☑	Monthly	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☐	Not performed	☐

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Monthly	☑
Automatic Zero/Span Tests	☑	Weekly	☑
Manual Zero/Span Tests	☑	Weekly	☑
Automatic Precision Level Tests	☑	Weekly	☑
Manual Precision Level Test	☑	Weekly	☑
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	Results are recorded weekly on a checklist

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The meteorological and ozone instrument checks and maintenance are performed by the State of Maine DEP.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	ACA416	Technician	Eric Hebert	Site Visit Date	10/03/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings, 90%
2	Are the Site Status Report Forms being completed and filed correctly?	☑	Flow and general observation sections only
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐	Not performed	☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	As needed	☑
Sample Line Check for Dirt/Water	☐	Not performed	☐

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

This site is operated by both the NPS and the State of Maine DEP. It is not visited by ARS for semiannual calibration and maintenance visits. The site operator does not perform many of the routine checks conducted at other CASTNET sites, such as tip checks, wetness sensor tests, and visual checks of the blowers. The state of Maine personnel maintain the meteorological systems and the ozone monitor.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID ACA416 **Technician** Eric Hebert **Site Visit Date** 10/03/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8460p	CNU20941M6	none
DAS	Environmental Sys Corp	8832	A3506K	none
Elevation	Elevation	1	None	None
F460 translator	Climatronics	100163	683	none
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1288	01342
Met tower	Climatronics	unknown	illegible	none
Ozone	ThermoElectron Inc	49C	49C-74536-376	90744
Ozone Standard	ThermoElectron Inc	49i PSA2AB	1009941498	none
Precipitation	Climatronics	100508-2	illegible	01322
Relative Humidity	Rotronic	MP 601A	67857	none
Sample Tower	Aluma Tower	B	AT-71103-7I-3	none
Shelter Temperature	Agilaire	Unknown	None	none
Shield (2 meter)	Climatronics	100325	illegible	none
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	PY16746	none
Temperature Translator	Climatronics	100088-2	401	03630
Temperature2meter	Climatronics	100093	missing	none
Wind Direction	Climatronics	100076	illegible	none
Wind Speed	Climatronics	100075	illegible	none
Zero air pump	ThermoElectron Inc	111	111-30215-237	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ASH135-Eric Hebert-10/04/2018						
1	10/4/2018	Computer	Dell	07070	Inspiron 15	Unknown
2	10/4/2018	DAS	Campbell	000634	CR3000	4933
3	10/4/2018	Elevation	Elevation	None	1	None
4	10/4/2018	Filter pack flow pump	Thomas	01449	107CA110	118700000595
5	10/4/2018	Flow Rate	Apex	000649	AXMC105LPMDPCV	illegible
6	10/4/2018	Infrastructure	Infrastructure	none	none	none
7	10/4/2018	Modem	Raven	06471	H4222-C	0808311148
8	10/4/2018	Ozone	ThermoElectron Inc	000730	49i A1NAA	1105347325
9	10/4/2018	Ozone Standard	ThermoElectron Inc	000442	49i A3NAA	CM08200018
10	10/4/2018	Sample Tower	Aluma Tower	03536	A	none
11	10/4/2018	Shelter Temperature	Campbell	none	107-L	none
12	10/4/2018	Siting Criteria	Siting Criteria	None	1	None
13	10/4/2018	Temperature	RM Young	06389	41342	13994
14	10/4/2018	Zero air pump	Werther International	06923	C 70/4	000836208

DAS Data Form

DAS Time Max Error: 0.07

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	4933	ASH135	Eric Hebert	10/04/2018	DAS	Primary

Das Date: 10/4 /2018
Das Time: 11:16:00
Das Day: 277

Audit Date 10/4 /2018
Audit Time 11:15:56
Audit Day 277

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0000	0.0001	0.0000	0.0001

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/24/2018	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.3001	V	V	0.0001
7	0.5000	0.5001	0.5001	V	V	0.0000
7	0.7000	0.7001	0.7001	V	V	0.0000
7	0.9000	0.9002	0.9002	V	V	0.0000
7	1.0000	1.0003	1.0004	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	ASH135	Eric Hebert	10/04/2018	Flow Rate	000649

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.03
1.10%	1.32%			**Cal Factor Full Scale**	0.98
				Rotometer Reading:	1.45

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	test pt 1	1.525	1.520	1.52	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.526	1.520	1.52	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.524	1.520	1.53	0.000	1.51	l/m	l/m	-0.66%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	315 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347325	ASH135	Eric Hebert	10/04/2018	Ozone	000730

Slope:	0.97553	**Slope:**	0.00000
Intercept	0.19571	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.74	-0.80	-0.28	ppb		0.52
primary	2	14.39	14.27	13.83	ppb		-0.44
primary	3	33.98	33.80	33.19	ppb	-1.82	
primary	4	69.86	69.56	67.86	ppb	-2.47	
primary	5	111.19	110.76	108.40	ppb	-2.15	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.10	pass
Span	1.019	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	103.4 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	715.7 mmHg	pass
Cell A Tmp.	34.3 C	pass
Cell B Freq.	87.0 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	716.6 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	13994	ASH135	Eric Hebert	10/04/2018	Temperature	06389

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00757	**Intercept**	-0.09210
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.07	0.13		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.11	0.20	0.000	0.2	C	-0.02
primary	Temp Mid Range	26.32	26.21	0.000	26.3	C	0.06
primary	Temp High Range	46.65	46.39	0.000	46.3	C	-0.13

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ASH135	Eric Hebert	10/04/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.60	0.66		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00757	Intercept	-0.09210
Cert Date	2/13/2018	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.70	22.62	0.000	23.3	C	0.66
primary	Temp Mid Range	22.40	22.32	0.000	23.0	C	0.63
primary	Temp Mid Range	22.90	22.82	0.000	23.3	C	0.5

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ASH135	Technician	Eric Hebert	Site Visit Date	10/04/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-17)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type A	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 **Parameter:** DasComments

The met tower has been removed and the 10 meter temperature sensor is mounted in a naturally aspirated shield on the sample tower.

2 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the sample train is leak tested once each month.

3 **Parameter:** SitingCriteriaCom

The evergreen plantation previously 20 meters south of the site has been harvested.

4 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, clean, and very well organized. Rot is beginning at the bottom of the walls and floor.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ASH135	**Technician**	Eric Hebert	**Site Visit Date**	10/04/2018

Site Sponsor (agency)	EPA	**USGS Map**	Squa Pan
Operating Group	private	**Map Scale**	
AQS #	23-003-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	46.6039
Deposition Measurement	dry	**QAPP Longitude**	-68.4142
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	235
Terrain	gently rolling	**QAPP Declination**	18.7
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(207) 435-6482	**Audit Latitude**	46.603832
Site Address 1	Radar Road	**Audit Longitude**	-68.413227
Site Address 2		**Audit Elevation**	231
County	Aroostook	**Audit Declination**	-18.2
City, State	Ashland, ME		
Zip Code	04732	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☑	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2149-17)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition, clean, and very well organized. Rot is beginning at the bottom of the walls and floor.				
Site OK	☑	**Notes**					

Driving Directions

From I-95 take exit #286 which is route 212. Take route 212 west to route 11. Turn north on route 11 and continue toward Ashland. Approximately 2 miles south of Ashland turn left (west) on Goding Road at the DEP sign. The site is approximately 1.5 miles straight on Goding Rd. (go straight at the 90 deg curve).

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ASH135 **Technician** Eric Hebert **Site Visit Date** 10/04/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m	30 m	☐
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The evergreen plantation previously 20 meters south of the site has been harvested.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ASH135	Technician	Eric Hebert	Site Visit Date	10/04/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	Pointed south to avoid building
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID ASH135 **Technician** Eric Hebert **Site Visit Date** 10/04/2018

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	Temperature only
2	**Are all the meteorological sensors operational online, and reporting data?**	☑	Temperature only
3	**Are the shields for the temperature and RH sensors clean?**	☑	
4	**Are the aspirated motors working?**	☑	N/A
5	**Is the solar radiation sensor's lens clean and free of scratches?**	☑	N/A
6	**Is the surface wetness sensor grid clean and undamaged?**	☑	N/A
7	**Are the sensor signal and power cables intact, in good condition, and well maintained?**	☑	
8	**Are the sensor signal and power cable connections protected from the elements and well maintained?**	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	ASH135	Technician	Eric Hebert	Site Visit Date	10/04/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID ASH135 **Technician** Eric Hebert **Site Visit Date** 10/04/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☐

11 **Tower comments?**

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The met tower has been removed and the 10 meter temperature sensor is mounted in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	ASH135	Technician	Eric Hebert	Site Visit Date	10/04/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☑	☐	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☑	☐	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☑	☐	☐
Solar radiation sensor	☐	☐	☑	Modem	☑	☐	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☑	☐	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☐	☑	☐
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☑	☐
Ozone analyzer	☑	☐	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☑	☐	☐	Shelter air conditioner	☐	☑	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	June 2007	☑
HASP	☑	Oct 2015	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☑		☑

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	ASH135	Technician	Eric Hebert	Site Visit Date	10/04/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	N/A	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, call-in

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The ozone inlet filter is replaced and the sample train is leak tested once each month.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID ASH135 **Technician** Eric Hebert **Site Visit Date** 10/04/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S10-rev002

Site ID ASH135 **Technician** Eric Hebert **Site Visit Date** 10/04/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07070
DAS	Campbell	CR3000	4933	000634
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	118700000595	01449
Flow Rate	Apex	AXMC105LPMDPC	illegible	000649
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0808311148	06471
Ozone	ThermoElectron Inc	49i A1NAA	1105347325	000730
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200018	000442
Sample Tower	Aluma Tower	A	none	03536
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	13994	06389
Zero air pump	Werther International	C 70/4	000836208	06923

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
WST109-Korey Devins-10/08/2018						
1	10/8/2018	Computer	Dell	07027	Inspiron 15	FX2MC12
2	10/8/2018	DAS	Campbell	000427	CR3000	2526
3	10/8/2018	Elevation	Elevation	None	1	None
4	10/8/2018	Filter pack flow pump	Thomas	00857	107CA118	00001610787
5	10/8/2018	Flow Rate	Apex	000848	AXMC105LPMDPCV	illegible
6	10/8/2018	Infrastructure	Infrastructure	none	none	none
7	10/8/2018	Modem	Raven	06598	V4221-V	0844349943
8	10/8/2018	Ozone	ThermoElectron Inc	000611	49i A1NAA	1009241795
9	10/8/2018	Ozone Standard	ThermoElectron Inc	000696	49i A3NAA	1030244812
10	10/8/2018	Sample Tower	Aluma Tower	000825	B	unknown
11	10/8/2018	Shelter Temperature	Campbell	none	107-L	none
12	10/8/2018	Siting Criteria	Siting Criteria	None	1	None
13	10/8/2018	Temperature	RM Young	04317	41342	4014
14	10/8/2018	Zero air pump	Werther International	06934	P 70/4	000821881

DAS Data Form

DAS Time Max Error: 0.03

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2526	WST109	Korey Devins	10/08/2018	DAS	Primary

Das Date: 10/8 /2018
Das Time: 12:54:58
Das Day: 281

Audit Date 10/8 /2018
Audit Time 12:55:00
Audit Day 281

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0002	0.0001	0.0002

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/24/2018	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.5000	0.5000	V	V	0.0000
7	0.7000	0.7000	0.6999	V	V	-0.0001
7	0.9000	0.9000	0.8999	V	V	-0.0001
7	1.0000	1.0001	0.9999	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	WST109	Korey Devins	10/08/2018	Flow Rate	000848

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
0.44%	0.66%			**Cal Factor Full Scale**	1.01
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	test pt 1	1.510	1.510	1.50	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 2	1.511	1.510	1.50	0.000	1.51	l/m	l/m	0.00%
primary	test pt 3	1.512	1.510	1.50	0.000	1.50	l/m	l/m	-0.66%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	150 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241795	WST109	Korey Devins	10/08/2018	Ozone	000611

Slope:	0.95382	**Slope:**	0.00000
Intercept	1.30927	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.54	-0.60	0.49	ppb		1.09
primary	2	15.13	15.01	15.71	ppb		0.7
primary	3	34.81	34.62	34.58	ppb	-0.12	
primary	4	67.22	66.93	65.16	ppb	-2.68	
primary	5	111.13	110.70	106.80	ppb	-3.59	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.20	pass
Span	0.992	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.5 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	726.2 mmHg	pass
Cell A Tmp.	32.0 C	pass
Cell B Freq.	98.0 kHz	pass
Cell B Noise	1.1 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	727.1 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4014	WST109	Korey Devins	10/08/2018	Temperature	04317

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00757	**Intercept**	-0.09210
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.07	0.13		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.11	-0.02	0.000	0.0	C	0.05
primary	Temp Mid Range	24.22	24.13	0.000	24.0	C	-0.13
primary	Temp High Range	49.45	49.17	0.000	49.1	C	-0.04

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	WST109	Korey Devins	10/08/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.42	0.64		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00757	Intercept	-0.09210
Cert Date	2/13/2018	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.24	25.14	0.000	25.0	C	-0.18
primary	Temp Mid Range	27.96	27.84	0.000	27.2	C	-0.64
primary	Temp Mid Range	26.18	26.07	0.000	25.6	C	-0.44

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	WST109	Technician	Korey Devins	Site Visit Date	10/08/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-16)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	WST109	Korey Devins	10/08/2018	Moisture Present	Apex	4450	☐	☐

The filter sample tubing has drops of moisture in low sections outside the shelter.

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

Ozone sample train leak checks are being conducted every two weeks.

2 **Parameter:** SitingCriteriaCom

The site is in a small clearing surrounded by mountain forest.

3 **Parameter:** SiteOKNotes

State of NH Department of Environmental Services contact is Tom Fazzina (603) 271-0911 and tfazzina@DES.state.NH.US

4 **Parameter:** MetSensorComme

The temperature sensor is now mounted in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	WST109	**Technician**	Korey Devins	**Site Visit Date**	10/08/2018

Site Sponsor (agency)	EPA	**USGS Map**	Woodstock
Operating Group	IES/USFS	**Map Scale**	
AQS #	33-009-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	43.9446
Deposition Measurement	dry, wet	**QAPP Longitude**	-71.7008
Land Use	woodland - mixed	**QAPP Elevation Meters**	258
Terrain	complex	**QAPP Declination**	15.9
Conforms to MLM	No	**QAPP Declination Date**	12/28/2004
Site Telephone	(603) 726-4935	**Audit Latitude**	43.944519
Site Address 1	234 Mirror Lake Road	**Audit Longitude**	-71.700787
Site Address 2		**Audit Elevation**	255
County	Grafton	**Audit Declination**	-15.3
City, State	Campton, NH		
Zip Code	03223	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2149-16)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**					
Site OK	☑	**Notes**	State of NH Department of Environmental Services contact is Tom Fazzina (603) 271-0911 and tfazzina@DES.state.NH.US				

Driving Directions From I-93 take exit 30 and go south on route 3 for approximately 2 miles. Turn right on Mirror Lake road and continue to the end of the road. The site is through the gate on the right.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID WST109 **Technician** Korey Devins **Site Visit Date** 10/08/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	10 - 30 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☐

Siting Criteria Comment

The site is in a small clearing surrounded by mountain forest.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	WST109	Technician	Korey Devins	Site Visit Date	10/08/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	Temperature only
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	Temperature only
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The temperature sensor is now mounted in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	WST109	Technician	Korey Devins	Site Visit Date	10/08/2018

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	Moderately clean
4	Are the aspirated motors working?	☑	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	WST109	Technician	Korey Devins	Site Visit Date	10/08/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 15 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	Moisture in tubing only
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID WST109 **Technician** Korey Devins **Site Visit Date** 10/08/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☐
11	Tower comments?	Met tower removed	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	WST109	Technician	Korey Devins	Site Visit Date	10/08/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☑	☐	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☑	☐	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☑	☐	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☑	☐	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☑	☐
Solar radiation translator	☐	☐	☑	UPS	☐	☑	☐
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☑	☐	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☑	☐	☐	Shelter air conditioner	☐	☑	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2014	☑
HASP	☑	Oct 2014	☑
Field Ops Manual	☑	Oct 2014	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☑
Preventive maintenance schedul	☑		☑

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	WST109	Technician	Korey Devins	Site Visit Date	10/08/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	The site operator was trained by the previous operator, who was trained by the previous operator
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	As needed	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	As needed	☑
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Every 2 weeks	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	logbook, call-in

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Ozone sample train leak checks are being conducted every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID WST109 **Technician** Korey Devins **Site Visit Date** 10/08/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S10-rev002

Site ID WST109 **Technician** Korey Devins **Site Visit Date** 10/08/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	FX2MC12	07027
DAS	Campbell	CR3000	2526	000427
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA118	00001610787	00857
Flow Rate	Apex	AXMC105LPMDPC	illegible	000848
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844349943	06598
Ozone	ThermoElectron Inc	49i A1NAA	1009241795	000611
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244812	000696
Sample Tower	Aluma Tower	B	unknown	000825
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4014	04317
Zero air pump	Werther International	P 70/4	000821881	06934

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DEN417-Martin Valvur-10/10/2018						
1	10/10/2018	Computer	Hewlett Packard	none	ProBook	5CB22906R7
2	10/10/2018	DAS	Environmental Sys Corp	90600	8816	2274
3	10/10/2018	Elevation	Elevation	None	1	None
4	10/10/2018	Filter pack flow pump	Thomas	none	107CAB18B	099800009754
5	10/10/2018	Flow Rate	Tylan	90966	FC280SAV	AW9706011
6	10/10/2018	Infrastructure	Infrastructure	none	none	none
7	10/10/2018	Mainframe	Climatronics	none	100081	1293
8	10/10/2018	Mainframe power supply	Climatronics	none	101074	685
9	10/10/2018	Met tower	Glen Martin Engineering	none	unknown	none
10	10/10/2018	MFC power supply	Tylan	90967	RO-32	FP9706004
11	10/10/2018	Modem	US Robotics	none	33.6 fax modem	unknown
12	10/10/2018	Ozone	ThermoElectron Inc	90778	49C	49C-77033-384
13	10/10/2018	Ozone Standard	ThermoElectron Inc	none	49C	49C-71310-368
14	10/10/2018	Printer	Canon	none	PC425	unknown
15	10/10/2018	Sample Tower	Aluma Tower	none	B	AT-71102-7I-5
16	10/10/2018	Shelter Temperature	ARS	none	none	006
17	10/10/2018	Siting Criteria	Siting Criteria	None	1	None
18	10/10/2018	Temperature2meter	RM Young	none	41342	018533
19	10/10/2018	Zero air pump	Werther International	none	PC70/4	526281

DAS Data Form

DAS Time Max Error: 2.67

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2274	DEN417	Martin Valvur	10/10/2018	DAS	Primary

Das Date: 10/10/2018 **Audit Date** 10/10/2018
Das Time: 7:22:45 **Audit Time** 7:20:05
Das Day: 283 **Audit Day** 283

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0002	0.0002	0.0002

Mfg	HY	**Parameter**	DAS
Serial Number	12010039329	**Tfer Desc.**	Source generator (D
Tfer ID	01322		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/15/2014	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/14/2018	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0004	-0.0002	V	V	0.0002
7	0.1000	0.1000	0.1001	V	V	0.0001
7	0.3000	0.3000	0.2999	V	V	-0.0001
7	0.5000	0.4997	0.4999	V	V	0.0002
7	0.7000	0.7001	0.7002	V	V	0.0001
7	0.9000	0.8996	0.8998	V	V	0.0002
7	1.0000	0.9995	0.9997	V	V	0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9706011	DEN417	Martin Valvur	10/10/2018	Flow Rate	90966

Mfg	Tylan
SN/Owner ID	FP9706004 90967
Parameter	MFC power supply

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	0.98450	**Intercept**	0.10300
Cert Date	3/1/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
1.93%	2.07%			

Cal Factor Zero	0.234
Cal Factor Full Scale	5.589
Rotometer Reading:	3.15

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.24	0.0000	0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.22	0.0000	0.05	l/m	l/m	
primary	test pt 1	3.013	2.960	2.59	0.0000	3.01	l/m	l/m	1.72%
primary	test pt 2	3.013	2.960	2.59	0.0000	3.02	l/m	l/m	1.99%
primary	test pt 3	3.010	2.950	2.59	0.0000	3.01	l/m	l/m	2.07%

Sensor Component	Condition	Status
Leak Test		pass
Tubing Condition	Good	pass
Filter Position	Poor	Fail
Rotometer Condition	Clean and dry	pass
Moisture Present	No moisture present	pass
Filter Distance	5.0 cm	Pass
Filter Depth	-0.5 cm	Fail
Filter Azimuth	10 deg	pass
System Memo		pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-77033-384	DEN417	Martin Valvur	10/10/2018	Ozone	90778

Slope:	1.00467	**Slope:**	0.00000
Intercept	-1.05102	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00470	**Intercept**	0.08880
Cert Date	6/12/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	1.50	1.40	0.10	ppb		-1.3
primary	2	14.50	14.34	13.80	ppb		-0.54
primary	3	34.90	34.64	34.50	ppb	-0.4	
primary	4	65.10	64.70	63.87	ppb	-1.29	
primary	5	107.10	106.51	105.80	ppb	-0.67	

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.50	**Status**	pass
Sensor Component	Span	**Condition**	1.014	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	-0.0002	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	0.9998	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	116.1 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.64 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	682.7 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	33.8 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	85.1 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.65 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	682.1 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**	N/A	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	018533	DEN417	Martin Valvur	10/10/2018	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99986	Intercept	-0.01977
Cert Date	1/24/2018	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.18	0.26		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.00	0.02	0.0000	-0.11	C	-0.13
primary	Temp Mid Rang	21.80	21.82	0.0000	21.66	C	-0.16
primary	Temp High Rang	45.45	45.48	0.0000	45.22	C	-0.26

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	Blower Status Switch	Condition	N/A	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	006	DEN417	Martin Valvur	10/10/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.58	0.97		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99986	Intercept	-0.01977
Cert Date	1/24/2018	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.22	24.24	0.000	24.9	C	0.63
primary	Temp Mid Range	24.79	24.81	0.000	24.9	C	0.13
primary	Temp Mid Range	23.80	23.82	0.000	24.8	C	0.97

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	DEN417	Technician	Martin Valvur	Site Visit Date	10/10/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8814	896 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	DEN417	Martin Valvur	10/10/2018	Filter Position	Tylan	3168	☐	☐

The filter attachment plate is mounted too low in the enclosure resulting in the filter being exposed to wind-driven rain and in the standard geometric orientation.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator uses one gloved hand, and the same glove, to remove and install the filter pack. Leak checks are performed when the ambient temperature is above -10 C.

2 **Parameter:** ShelterCleanNotes

The shelter is in good condition, clean, neat, and very well organized.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	DEN417	**Technician**	Martin Valvur	**Site Visit Date**	10/10/2018

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Healy C-4
Operating Group	NPS	**Map Scale**	
AQS #	02-068-0003	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	ozone, IMPROVE	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(907) 683-9638	**Audit Latitude**	63.7232
Site Address 1	mile 238 Parks Highway	**Audit Longitude**	-148.9676
Site Address 2		**Audit Elevation**	663
County	Denali Borough	**Audit Declination**	19.3
City, State	Denali Park, AK		**Present**
Zip Code	99755	**Fire Extinguisher**	☐
Time Zone	Alaska Time Zone	**First Aid Kit**	☐
Primary Operator		**Safety Glasses**	☑
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☑
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	8814	**Shelter Size**	896 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, clean, neat, and very well organized.				
Site OK	☑	**Notes**					

Driving Directions

From either Anchorage or Fairbanks, take the Parks Highway (route 3) north or south respectively. Just south of the town of Healy turn west into Denali National Park. The road is well marked. Continue on the park road a few miles to the Park Headquarters. The site is approximately 100 yards up a residential road on the opposite side of the street from the headquarters parking lot.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID DEN417 **Technician** Martin Valvur **Site Visit Date** 10/10/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	20 - 30 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	DEN417	Technician	Martin Valvur	Site Visit Date	10/10/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID DEN417 **Technician** Martin Valvur **Site Visit Date** 10/10/2018

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	Temperature only
2	**Are all the meteorological sensors operational online, and reporting data?**	☑	Temperature only
3	**Are the shields for the temperature and RH sensors clean?**	☑	
4	**Are the aspirated motors working?**	☑	
5	**Is the solar radiation sensor's lens clean and free of scratches?**	☑	N/A
6	**Is the surface wetness sensor grid clean and undamaged?**	☑	N/A
7	**Are the sensor signal and power cables intact, in good condition, and well maintained?**	☑	
8	**Are the sensor signal and power cable connections protected from the elements and well maintained?**	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	DEN417	Technician	Martin Valvur	Site Visit Date	10/10/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID DEN417 **Technician** Martin Valvur **Site Visit Date** 10/10/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?		

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID DEN417 **Technician** Martin Valvur **Site Visit Date** 10/10/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☐	☑	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☐	☑	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☐	☑	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☑	☐	☐
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☑	☐
Ozone analyzer	☑	☐	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☑	☐	☐
Filter pack MFC power supply	☐	☑	☐				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑		☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☑	Dataview	☑
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☑	Dataview

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID DEN417 **Technician** Martin Valvur **Site Visit Date** 10/10/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Site operator trained on-site by ARS employee
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☑	N/A	☑
Manual Rain Gauge Test	☑	Monthly	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Monthly	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Quarterly	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☐		☐
Zero Air Desiccant Check	☑	Semiannually	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	Dataview

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID DEN417 **Technician** Martin Valvur **Site Visit Date** 10/10/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed various times
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	One set of gloves only
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☑	Weekly	☑
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	As needed	☑
Sample Line Check for Dirt/Water	☑	As needed	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The site operator uses one gloved hand, and the same glove, to remove and install the filter pack. Leak checks are performed when the ambient temperature is above -10 C.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID DEN417 **Technician** Martin Valvur **Site Visit Date** 10/10/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	5CB22906R7	none
DAS	Environmental Sys Corp	8816	2274	90600
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	099800009754	none
Flow Rate	Tylan	FC280SAV	AW9706011	90966
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1293	none
Mainframe power supply	Climatronics	101074	685	none
Met tower	Glen Martin Engineering	unknown	none	none
MFC power supply	Tylan	RO-32	FP9706004	90967
Modem	US Robotics	33.6 fax modem	unknown	none
Ozone	ThermoElectron Inc	49C	49C-77033-384	90778
Ozone Standard	ThermoElectron Inc	49C	49C-71310-368	none
Printer	Canon	PC425	unknown	none
Sample Tower	Aluma Tower	B	AT-71102-7I-5	none
Shelter Temperature	ARS	none	006	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	018533	none
Zero air pump	Werther International	PC70/4	526281	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
RED004-Sandy Grenville-10/22/2018						
1	10/22/2018	DAS	Campbell	none	CR850	28383
2	10/22/2018	elevation	Elevation	none	none	none
3	10/22/2018	Filter pack flow pump	Thomas	none	1420 VP	42624821
4	10/22/2018	Flow Rate	Apex	000857	AXMC105LPMDPCV	150623
5	10/22/2018	Infrastructure	Infrastructure	none	none	none
6	10/22/2018	Modem	Sierra wireless	07000	unknown	unknown
7	10/22/2018	Sample Tower	Aluma Tower	000813	B	unknown
8	10/22/2018	siting criteria	Siting Criteria	none	none	None
9	10/22/2018	Temperature	RM Young	06986	41342	024087

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	28383	RED004	Sandy Grenville	10/22/2018	DAS	Primary

Das Date: 10/22/2018
Das Time: 7:51:00
Das Day: 295

Audit Date 10/22/2018
Audit Time 7:51:00
Audit Day 295

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0017	0.0021	0.0017	0.0021

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2018	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	-0.0013	V	V	-0.0012
7	0.1000	0.0998	0.0978	V	V	-0.0020
7	0.3000	0.2997	0.2976	V	V	-0.0021
7	0.5000	0.4995	0.4980	V	V	-0.0015
7	0.7000	0.6995	0.6977	V	V	-0.0018
7	0.9000	0.8993	0.8974	V	V	-0.0019
7	1.0000	0.9992	0.9980	V	V	-0.0012

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	150623	RED004	Sandy Grenville	10/22/2018	Flow Rate	000857

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 220-H
Tfer ID	01414		
Slope	1.00055	**Intercept**	-0.01570
Cert Date	2/21/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.017
1.52%	1.63%			**Cal Factor Full Scale**	1.004
				Rotometer Reading:	2.9

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.01	l/m	l/m	
primary	test pt 1	3.050	3.060	2.96	0.000	3.01	l/m	l/m	-1.63%
primary	test pt 2	3.036	3.050	2.96	0.000	3.01	l/m	l/m	-1.31%
primary	test pt 3	3.041	3.060	2.96	0.000	3.01	l/m	l/m	-1.63%

Sensor Component	Leak Test	**Condition**		**Status**	Pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.2 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.9 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	210 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	024087	RED004	Sandy Grenville	10/22/2018	Temperature	06986

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00798	**Intercept**	0.09168
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
1.38	2.24		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.12	0.03	0.000	0.0	C	-0.07
primary	Temp Mid Range	25.76	25.47	0.000	23.2	C	-2.24
primary	Temp High Range	48.80	48.32	0.000	46.5	C	-1.82

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	RED004	Technician	Sandy Grenville	Site Visit Date	10/22/2018

Shelter Make	Shelter Model	Shelter Size

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	N/A	pass
Met Tower	N/A	pass
Moisture Trap	Not installed	pass
Power Cables	Good	pass
Shelter Temp Control	N/A	pass
Rotometer	Installed	pass
Sample Tower	Good	pass
Shelter Condition	N/A	pass
Shelter Door	N/A	pass
Shelter Roof	N/A	pass
Shelter Floor	N/A	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass

Field Systems Comments

1 **Parameter:** DocumentationCo

There is no site logbook and all manuals are kept electronically since the site is a small footprint site with no place to store hardcopies.

2 **Parameter:** SitingCriteriaCom

The site has been cleared approximately 8 meters around the base of the tower. Herbicide was used.

3 **Parameter:** ShelterCleanNotes

Small footprint site with enclosure for instruments only. No shelter.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	RED004	**Technician**	Sandy Grenville	**Site Visit Date**	10/22/2018

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	Red Lake Nation / AMEC	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer		**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	47.86382
Site Address 1		**Audit Longitude**	-94.83535
Site Address 2		**Audit Elevation**	374
County	Beltrami	**Audit Declination**	
City, State	Redby, MN		
Zip Code	56670	**Fire Extinguisher** ☐ Present	
Time Zone	Central	**First Aid Kit** ☐	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☐	
Backup Op. E-mail		**Stable Entry Step** ☐	

Shelter Working Room ☐ **Make** **Model** **Shelter Size**

Shelter Clean ☐ **Notes** Small footprint site with enclosure for instruments only. No shelter.

Site OK ☑ **Notes**

Driving Directions

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID RED004 **Technician** Sandy Grenville **Site Visit Date** 10/22/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The site has been cleared approximately 8 meters around the base of the tower. Herbicide was used.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	RED004	Technician	Sandy Grenville	Site Visit Date	10/22/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID RED004 **Technician** Sandy Grenville **Site Visit Date** 10/22/2018

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	Temperature only
2	**Are all the meteorological sensors operational online, and reporting data?**	☑	Temperature only
3	**Are the shields for the temperature and RH sensors clean?**	☑	
4	**Are the aspirated motors working?**	☑	N/A
5	**Is the solar radiation sensor's lens clean and free of scratches?**	☑	N/A
6	**Is the surface wetness sensor grid clean and undamaged?**	☑	N/A
7	**Are the sensor signal and power cables intact, in good condition, and well maintained?**	☑	
8	**Are the sensor signal and power cable connections protected from the elements and well maintained?**	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID RED004 **Technician** Sandy Grenville **Site Visit Date** 10/22/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 teflon by 8 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	N/A
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID RED004 **Technician** Sandy Grenville **Site Visit Date** 10/22/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	N/A

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?		

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	RED004	Technician	Sandy Grenville	Site Visit Date	10/22/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☐	☑	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☐	☑	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☐	☐	☑
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☐	☑
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☐	☐	☑	Shelter heater	☐	☐	☑
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☐	☐	☑
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☐		☐
SSRF	☑		☑
Site Ops Manual	☑	Oct 2014	☑
HASP	☑	Oct 2014	☑
Field Ops Manual	☑	Oct 2014	☑
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☐	No Logbook
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

There is no site logbook and all manuals are kept electronically since the site is a small footprint site with no place to store hardcopies.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	RED004	Technician	Sandy Grenville	Site Visit Date	10/22/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained by AMEC technician during site installation
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☐	N/A	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☐	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☐	N/A	☑
Automatic Zero/Span Tests	☐	N/A	☑
Manual Zero/Span Tests	☐	N/A	☑
Automatic Precision Level Tests	☐	N/A	☑
Manual Precision Level Test	☐	N/A	☐
Analyzer Diagnostics Tests	☐	N/A	☑
In-line Filter Replacement (at inlet)	☐	N/A	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☐	N/A	☑
Zero Air Desiccant Check	☐	N/A	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	N/A
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	N/A
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID RED004 **Technician** Sandy Grenville **Site Visit Date** 10/22/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed various times
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S10-rev002

Site ID RED004 **Technician** Sandy Grenville **Site Visit Date** 10/22/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	28383	none
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	1420 VP	42624821	none
Flow Rate	Apex	AXMC105LPMDPC	150623	000857
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	unknown	unknown	07000
Sample Tower	Aluma Tower	B	unknown	000813
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342	024087	06986

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SAL133-Sandy Grenville-10/27/2018						
1	10/27/2018	Computer	Dell	07014	Inspiron 15	OF3WC8
2	10/27/2018	DAS	Campbell	000351	CR3000	2129
3	10/27/2018	Elevation	Elevation	None	1	None
4	10/27/2018	Filter pack flow pump	Thomas	00765	107CA110	0000141
5	10/27/2018	Flow Rate	Apex	000549	AXMC105LPMDPCV	illegible
6	10/27/2018	Infrastructure	Infrastructure	none	none	none
7	10/27/2018	Modem	Raven	06612	H4223-C	0844355815
8	10/27/2018	Ozone	ThermoElectron Inc	000628	49i A3NAA	1009241788
9	10/27/2018	Ozone Standard	ThermoElectron Inc	000215	49i A3NAA	0622717856
10	10/27/2018	Sample Tower	Aluma Tower	none	B	AT-51065-5-G-A
11	10/27/2018	Shelter Temperature	Campbell	none	107-L	none
12	10/27/2018	Siting Criteria	Siting Criteria	None	1	None
13	10/27/2018	Temperature	RM Young	06410	41342	14043
14	10/27/2018	Zero air pump	Werther International	06935	C 70/4	000829172

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2129	SAL133	Sandy Grenville	10/27/2018	DAS	Primary

Das Date: 10/27/2018
Das Time: 13:49:00
Das Day: 300

Audit Date 10/27/2018
Audit Time 13:49:00
Audit Day 300

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0002	0.0001	0.0002

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2018	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4996	0.4995	V	V	-0.0001
7	0.7000	0.6995	0.6995	V	V	0.0000
7	0.9000	0.8994	0.8993	V	V	-0.0001
7	1.0000	0.9993	0.9991	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	SAL133	Sandy Grenville	10/27/2018	Flow Rate	000549

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 220-H
Tfer ID	01414		
Slope	1.00055	**Intercept**	-0.01570
Cert Date	2/21/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.06
4.67%	5.10%			**Cal Factor Full Scale**	1.05
				Rotometer Reading:	1.4

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.08	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.03	0.000	0.15	l/m	l/m	
primary	test pt 1	1.553	1.570	1.45	0.000	1.50	l/m	l/m	-4.46%
primary	test pt 2	1.552	1.570	1.45	0.000	1.50	l/m	l/m	-4.46%
primary	test pt 3	1.557	1.570	1.45	0.000	1.49	l/m	l/m	-5.10%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241788	SAL133	Sandy Grenville	10/27/2018	Ozone	000628

Slope:	1.04441	**Slope:**	0.00000
Intercept	-0.41066	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.33	0.21	-0.32	ppb		-0.53
primary	2	15.87	15.71	16.19	ppb		0.48
primary	3	35.10	34.88	36.01	ppb	3.19	
primary	4	68.14	67.83	70.35	ppb	3.65	
primary	5	109.28	108.85	113.30	ppb	4.01	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.058	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	98.4 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	693.6 mmHg	pass
Cell A Tmp.	29.8 C	pass
Cell B Freq.	105.4 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	694.2 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14043	SAL133	Sandy Grenville	10/27/2018	Temperature	06410

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00798	**Intercept**	0.09168
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.06	0.14		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.12	0.03	0.000	0.2	C	0.14
primary	Temp Mid Range	25.13	24.84	0.000	24.8	C	-0.02
primary	Temp High Range	48.46	47.99	0.000	48.0	C	-0.03

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	SAL133	Sandy Grenville	10/27/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.65	1.12		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00798	Intercept	0.09168
Cert Date	2/13/2018	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	19.29	19.05	0.000	19.4	C	0.32
primary	Temp Mid Range	23.90	23.62	0.000	22.5	C	-1.12
primary	Temp Mid Range	20.30	20.05	0.000	20.6	C	0.5

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
SAL133	Sandy Grenville	10/27/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Fair	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and a zero/span/precision test is performed every two weeks.

2 **Parameter:** SitingCriteriaCom

The site is located next to a field usually planted with corn or soy beans.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition and there is evidence of a leak in the shelter roof and ants are present. It is clean, neat, and well organized.

4 **Parameter:** MetOpMaintCom

The temperature signal cable is showing signs of wear.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	SAL133	**Technician**	Sandy Grenville	**Site Visit Date**	10/27/2018

Site Sponsor (agency)	EPA	**USGS Map**	Lagro
Operating Group	private	**Map Scale**	
AQS #	18-169-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	agriculture	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone	(260) 782-2428	**Audit Latitude**	40.816038
Site Address 1	Hamilton Road	**Audit Longitude**	-85.661407
Site Address 2		**Audit Elevation**	250
County	Wabash	**Audit Declination**	-5
City, State	Lagro, IN		
Zip Code	46941	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☑	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition and there is evidence of a leak in the shelter roof and ants are present. It is clean, neat, and well organized.				
Site OK	☑	**Notes**					

Driving Directions From Huntington, IN take route 9 south a few miles to Division Road. Turn right (west) on Division and continue several miles to S 750 E, turn left (south). Turn right (west) at the first intersection (E 50 S). Turn left (south) at the next road, Hamilton or 725E. The site is about 1 mile on the right.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID SAL133 **Technician** Sandy Grenville **Site Visit Date** 10/27/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m	20 m	☐
Limited agricultural operations	200 m	20 m	☐
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The site is located next to a field usually planted with corn or soy beans.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	10/27/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	10/27/2018

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	Signs of wear
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The temperature signal cable is showing signs of wear.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	10/27/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 15 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID SAL133 **Technician** Sandy Grenville **Site Visit Date** 10/27/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☐

11 **Tower comments?**

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Site ID SAL133 **Technician** Sandy Grenville **Site Visit Date** 10/27/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	10/27/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☐	☑	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☐	☑	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☑	☐	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☑	☐
Solar radiation translator	☐	☐	☑	UPS	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☑	☐
Ozone analyzer	☑	☐	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☑	☐	☐	Shelter air conditioner	☐	☑	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑		☐
HASP	☑	Feb 2014	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	10/27/2018

Documentation

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	10/27/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained on-site by ESE employee (JBA)
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, logbook, call-in

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The ozone inlet filter is replaced and a zero/span/precision test is performed every two weeks.

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	10/27/2018

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	10/27/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	10/27/2018

Site operation procedures

Field Systems Data Form F-02058-1500-S10-rev002

Site ID SAL133 **Technician** Sandy Grenville **Site Visit Date** 10/27/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	OF3WC8	07014
DAS	Campbell	CR3000	2129	000351
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	0000141	00765
Flow Rate	Apex	AXMC105LPMDPC	illegible	000549
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4223-C	0844355815	06612
Ozone	ThermoElectron Inc	49i A3NAA	1009241788	000628
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717856	000215
Sample Tower	Aluma Tower	B	AT-51065-5-G-A	none
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14043	06410
Zero air pump	Werther International	C 70/4	000829172	06935

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAT175-Eric Hebert-11/07/2018						
1	11/7/2018	DAS	Campbell	000412	CR3000	2532
2	11/7/2018	Elevation	Elevation	None	1	None
3	11/7/2018	Filter pack flow pump	Brailsford	none	TD-4X2N	1016
4	11/7/2018	Flow Rate	Apex	000644	AXMC105LPMDPCV	illegible
5	11/7/2018	Infrastructure	Infrastructure	none	none	none
6	11/7/2018	Modem	Raven	06660	V4221-V	0918425101
7	11/7/2018	Sample Tower	Aluma Tower	666359	B	none
8	11/7/2018	Shield (10 meter)	RM Young	none	41003	none
9	11/7/2018	Siting Criteria	Siting Criteria	None	1	None
10	11/7/2018	Temperature	RM Young	06409	41342VO	14042
11	11/7/2018	UPS	ProSine	04576	1000w	unknown

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CAT175	Eric Hebert	11/07/2018	Flow Rate	000644

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.013
0.99%	1.18%			**Cal Factor Full Scale**	1.001
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	-0.01	l/m	l/m	
primary	test pt 1	1.520	1.520	1.49	0.000	1.50	l/m	l/m	-1.18%
primary	test pt 2	1.515	1.510	1.49	0.000	1.50	l/m	l/m	-0.60%
primary	test pt 3	1.520	1.520	1.49	0.000	1.50	l/m	l/m	-1.18%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	7.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14042	CAT175	Eric Hebert	11/07/2018	Temperature	06409

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00757	**Intercept**	-0.09210
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.15	0.16		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.05	0.04	0.000	-0.1	C	-0.16
primary	Temp Mid Range	25.98	25.88	0.000	25.8	C	-0.12
primary	Temp High Range	42.87	42.64	0.000	42.5	C	-0.16

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
CAT175	Eric Hebert	11/07/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 1977-1)	640 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	N/A	pass
Met Tower	N/A	pass
Moisture Trap	Not installed	pass
Power Cables	Good	pass
Shelter Temp Control	N/A	pass
Rotometer	Installed	pass
Sample Tower	Good	pass
Shelter Condition	Poor	Fail
Shelter Door	Poor	Fail
Shelter Roof	Fair	pass
Shelter Floor	Poor	Fail
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	CAT175	Eric Hebert	11/07/2018	Moisture Present	Apex	4212	☐	☐

The filter sample tubing has drops of moisture in low sections outside the shelter.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The SSRF forms are not complete.

2 **Parameter:** DasComments

The shelter is not temperature controlled. The site is solar and DC battery powered. The met tower has been removed and the temperature is being measured from the sample tower at 10 meters above ground.

3 **Parameter:** DocumentationCo

The site copies of the SSRF are no longer kept onsite.

4 **Parameter:** ShelterCleanNotes

The shelter is seriously deteriorated with rot and mold on the floor and walls. There are many unused and possibly depleted batteries stored in the shelter. The vegetation has been allowed to grow. The shelter roof has been repaired.

5 **Parameter:** PollAnalyzerCom

Ozone monitoring is no longer being conducted at the site.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CAT175	**Technician**	Eric Hebert	**Site Visit Date**	11/07/2018

Site Sponsor (agency)	EPA	**USGS Map**	Claryville
Operating Group	private	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	41.9423
Deposition Measurement	dry	**QAPP Longitude**	-74.5519
Land Use	woodland - mixed	**QAPP Elevation Meters**	765
Terrain	complex	**QAPP Declination**	13.5
Conforms to MLM	No	**QAPP Declination Date**	2/22/2006
Site Telephone	(845) 798-0947	**Audit Latitude**	41.942325
Site Address 1	Wildcat Mt. Road	**Audit Longitude**	-74.551999
Site Address 2		**Audit Elevation**	754
County	Ulster	**Audit Declination**	-13.2
City, State	Claryville, NY		
Zip Code	12725	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 1977-1)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is seriously deteriorated with rot and mold on the floor and walls. There are many unused and possibly depleted batteries stored in the shelter. The vegetation has been allowed to grow. The shelter roof has been repaired.				
Site OK	☑	**Notes**					

Driving Directions From Liberty, NY go west on route 52 toward Grahamsville. Just before reaching Grahamsville, turn left onto County Road 19 to Claryville. Stay on 19 through Claryville and turn left on Wildcat Mt Road immediately after crossing the bridge at the far end of town. Bear right and follow the semi-paved road for about 0.7 miles to the fork. Go right at the fork and turn left at the first house on the left. The site is about .75 miles up the dirt road behind the house.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 11/07/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CAT175	Technician	Eric Hebert	Site Visit Date	11/07/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	CAT175	Technician	Eric Hebert	Site Visit Date	11/07/2018

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	Natural aspiration
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	N/A
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	CAT175	Technician	Eric Hebert	Site Visit Date	11/07/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	Ozone not measured
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 teflon by 18 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☐	N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☐	N/A
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Ozone monitoring is no longer being conducted at the site.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 11/07/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☐	Solar power
8	Is the instrument shelter temperature controlled?	☐	Shelter not temperature controlled

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?	Met tower removed	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The shelter is not temperature controlled. The site is solar and DC battery powered. The met tower has been removed and the temperature is being measured from the sample tower at 10 meters above ground.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	CAT175	Technician	Eric Hebert	Site Visit Date	11/07/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☐	☑	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☑	☐	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☐	☑	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☐	☑
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☑	☐	☐
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☑	☐
Ozone analyzer	☐	☐	☑	Shelter heater	☐	☐	☑
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☐	☐	☑
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Oct 2015	☑
Field Ops Manual	☐		☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐	N/A	☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	Not present
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The site copies of the SSRF are no longer kept onsite.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	CAT175	Technician	Eric Hebert	Site Visit Date	11/07/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by previous operator
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☐	N/A	☑
Automatic Zero/Span Tests	☐	N/A	☑
Manual Zero/Span Tests	☐	N/A	☑
Automatic Precision Level Tests	☐	N/A	☑
Manual Precision Level Test	☐	N/A	☑
Analyzer Diagnostics Tests	☐	N/A	☑
In-line Filter Replacement (at inlet)	☐	N/A	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☐	N/A	☑
Zero Air Desiccant Check	☐	N/A	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	N/A
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☐	N/A
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☐	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 11/07/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings 95% of the time
2	Are the Site Status Report Forms being completed and filed correctly?	☐	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☐	
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	Logbook only
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐	Not performed	☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The SSRF forms are not complete.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID CAT175 **Technician** Eric Hebert **Site Visit Date** 11/07/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR3000	2532	000412
Elevation	Elevation	1	None	None
Filter pack flow pump	Brailsford	TD-4X2N	1016	none
Flow Rate	Apex	AXMC105LPMDPC	illegible	000644
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0918425101	06660
Sample Tower	Aluma Tower	B	none	666359
Shield (10 meter)	RM Young	41003	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	14042	06409
UPS	ProSine	1000w	unknown	04576

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ABT147-Eric Hebert-11/08/2018						
1	11/8/2018	Computer	Dell	07023	Inspiron 15	5C4MC12
2	11/8/2018	DAS	Campbell	000413	CR3000	2519
3	11/8/2018	Elevation	Elevation	None	1	None
4	11/8/2018	Filter pack flow pump	Thomas	02974	107CAB18	0493002469
5	11/8/2018	Flow Rate	Apex	000550	AXMC105LPMDPCV	50740
6	11/8/2018	Infrastructure	Infrastructure	none	none	none
7	11/8/2018	Modem	Raven	06609	H4223-C	0844356221
8	11/8/2018	Ozone	ThermoElectron Inc	000627	49i A1NAA	1009241772
9	11/8/2018	Ozone Standard	ThermoElectron Inc	000449	49i A3NAA	CM08200025
10	11/8/2018	Sample Tower	Aluma Tower	000017	B	AT-61152-A-H8-C
11	11/8/2018	Shelter Temperature	Campbell	none	107-L	none
12	11/8/2018	Siting Criteria	Siting Criteria	None	1	None
13	11/8/2018	Temperature	RM Young	04692	41342	6706
14	11/8/2018	Zero air pump	Werther International	06930	P 70/4	000829168

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2519	ABT147	Eric Hebert	11/08/2018	DAS	Primary

Das Date: 11/8 /2018 **Audit Date** 11/8 /2018
Das Time: 13:55:31 **Audit Time** 13:55:30
Das Day: 312 **Audit Day** 312

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0001	0.0001	0.0001

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000
Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/24/2018	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	-0.0001	V	V	-0.0001
7	0.1000	0.1000	0.0999	V	V	-0.0001
7	0.3000	0.3000	0.2999	V	V	-0.0001
7	0.5000	0.5000	0.4999	V	V	-0.0001
7	0.7000	0.7000	0.6999	V	V	-0.0001
7	0.9000	0.9000	0.8999	V	V	-0.0001
7	1.0000	1.0000	0.9999	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	50740	ABT147	Eric Hebert	11/08/2018	Flow Rate	000550

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.016
26.11%	26.11%			**Cal Factor Full Scale**	0.997
				Rotometer Reading:	2

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.44	0.000	-0.42	l/m	l/m	
primary	leak check	0.000	0.000	-0.17	0.000	-0.15	l/m	l/m	
primary	test pt 1	2.032	2.030	1.51	0.000	1.50	l/m	l/m	-26.11%
primary	test pt 2	2.034	2.030	1.51	0.000	1.50	l/m	l/m	-26.11%
primary	test pt 3	2.033	2.030	1.51	0.000	1.50	l/m	l/m	-26.11%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	240 deg	**Status**	Pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241772	ABT147	Eric Hebert	11/08/2018	Ozone	000627

Slope:	1.00265	**Slope:**	0.00000
Intercept	0.47031	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.53	-0.59	0.24	ppb		0.83
primary	2	14.28	14.16	14.18	ppb		0.02
primary	3	34.94	34.75	35.08	ppb	0.95	
primary	4	66.32	66.03	67.22	ppb	1.79	
primary	5	112.15	111.72	112.30	ppb	0.52	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	Not functioning	Fail
Offset	0.10	pass
Span	1.008	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	90.0 kHz	pass
Cell A Noise	1.4 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	721.0 mmHg	pass
Cell A Tmp.	31.8 C	pass
Cell B Freq.	90.2 kHz	pass
Cell B Noise	0.90 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	722.0 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	6706	ABT147	Eric Hebert	11/08/2018	Temperature	04692

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00757	**Intercept**	-0.09210
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.11	0.16		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.01	0.08	0.000	0.1	C	-0.03
primary	Temp Mid Range	22.63	22.55	0.000	22.4	C	-0.13
primary	Temp High Range	49.27	48.99	0.000	48.8	C	-0.16

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ABT147	Eric Hebert	11/08/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.14	0.17		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00757	Intercept	-0.09210
Cert Date	2/13/2018	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.49	27.37	0.000	27.5	C	0.1
primary	Temp Mid Range	27.92	27.80	0.000	27.6	C	-0.17
primary	Temp Mid Range	28.02	27.90	0.000	27.7	C	-0.16

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ABT147	Technician	Eric Hebert	Site Visit Date	11/08/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-9)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	ABT147	Eric Hebert	11/08/2018	Moisture Present	Apex	3683	☐	☐

The filter sample tubing has drops of moisture in low sections outside the shelter.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator reported that the "filter time off" field on the SSRF form should be the time that the filter is removed from the tower rather than the time that the filter flow pump is turned off.

2 **Parameter:** DasComments

The met tower has been removed.

3 **Parameter:** DocumentationCo

All site instrument manuals are on the site computer desktop folder.

4 **Parameter:** SitingCriteriaCom

Manure is routinely spread on the hay fields surrounding the site during the summer.

5 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

6 **Parameter:** MetSensorComme

Temperature mounted in naturally aspirated shield on sample tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ABT147	**Technician**	Eric Hebert	**Site Visit Date**	11/08/2018

Site Sponsor (agency)	EPA	**USGS Map**	Hampton
Operating Group	private	**Map Scale**	
AQS #	09-015-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	41.8402
Deposition Measurement	dry, wet	**QAPP Longitude**	-72.0111
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	209
Terrain	rolling	**QAPP Declination**	14.8
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(860) 974-2273	**Audit Latitude**	41.84046
Site Address 1	80 Ayers Road	**Audit Longitude**	-72.010368
Site Address 2		**Audit Elevation**	202
County	Windham	**Audit Declination**	-14.5
City, State	Abington, CT		**Present**
Zip Code	06230	**Fire Extinguisher**	☑ New in 2015
Time Zone	Eastern	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☑
Primary Op. Phone #		**Safety Hard Hat**	☑
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2149-9)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is clean and well organized.				
Site OK	☑	**Notes**					

Driving Directions

From Hartford take I-84 east to exit 69. Continue on route 74 east to route 44. Take route 44 east to Abington. At the traffic light in Abington, turn right (south) on route 97. Continue approximately 1.3 miles to Ayers Road which will be on the left. Ayers Road is a single lane paved road. The site is through the gate at the end of the road, in the field at the top of the hill past the barn.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ABT147 **Technician** Eric Hebert **Site Visit Date** 11/08/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m	10 m	☐
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Manure is routinely spread on the hay fields surrounding the site during the summer.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ABT147	Technician	Eric Hebert	Site Visit Date	11/08/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Temperature mounted in naturally aspirated shield on sample tower.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	ABT147	Technician	Eric Hebert	Site Visit Date	11/08/2018

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	N/A
2	Are all the meteorological sensors operational online, and reporting data?	☑	N/A
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	☑	N/A
6	Is the surface wetness sensor grid clean and undamaged?	☑	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	☑	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	ABT147	Technician	Eric Hebert	Site Visit Date	11/08/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 15 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	Moisture in tubing only
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID ABT147 **Technician** Eric Hebert **Site Visit Date** 11/08/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?	Met tower removed	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The met tower has been removed.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	ABT147	Technician	Eric Hebert	Site Visit Date	11/08/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☑	☐	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☑	☐	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☑	☐	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☑	☐	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☑	☐
Solar radiation translator	☐	☐	☑	UPS	☐	☑	☐
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☑	☐	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☑	☐	☐	Shelter air conditioner	☐	☑	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Sept 2016	☑
HASP	☑	Sept 2016	☑
Field Ops Manual	☐		☐
Calibration Reports	☑	Nov 2018	☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

All site instrument manuals are on the site computer desktop folder.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID ABT147 **Technician** Eric Hebert **Site Visit Date** 11/08/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	N/A	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	As needed	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	As needed	☑
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, logbook, call-in

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID ABT147 **Technician** Eric Hebert **Site Visit Date** 11/08/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The site operator reported that the "filter time off" field on the SSRF form should be the time that the filter is removed from the tower rather than the time that the filter flow pump is turned off.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID ABT147 **Technician** Eric Hebert **Site Visit Date** 11/08/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	5C4MC12	07023
DAS	Campbell	CR3000	2519	000413
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0493002469	02974
Flow Rate	Apex	AXMC105LPMDPC	50740	000550
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4223-C	0844356221	06609
Ozone	ThermoElectron Inc	49i A1NAA	1009241772	000627
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200025	000449
Sample Tower	Aluma Tower	B	AT-61152-A-H8-C	000017
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	6706	04692
Zero air pump	Werther International	P 70/4	000829168	06930

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PNF126-Eric Hebert-11/15/2018						
1	11/15/2018	Computer	Dell	0759	Inspiron 15	Unknown
2	11/15/2018	DAS	Campbell	illegible	CR3000	3817
3	11/15/2018	Elevation	Elevation	None	1	None
4	11/15/2018	Filter pack flow pump	Thomas	06030	107CAB18	060400022677
5	11/15/2018	Flow Rate	Apex	000655	AXMC105LPMDPCV	illegible
6	11/15/2018	Infrastructure	Infrastructure	none	none	none
7	11/15/2018	Modem	Raven	06597	V4221-V	0844349884
8	11/15/2018	Ozone	ThermoElectron Inc	000741	49i A1NAA	1105347316
9	11/15/2018	Ozone Standard	ThermoElectron Inc	000363	49i A3NAA	0726124691
10	11/15/2018	Sample Tower	Aluma Tower	000178	B	none
11	11/15/2018	Shelter Temperature	Campbell	none	107-L	none
12	11/15/2018	Siting Criteria	Siting Criteria	None	1	None
13	11/15/2018	Temperature	RM Young	04687	41342	6701
14	11/15/2018	Zero air pump	Werther International	06885	C 70/4	000814270
15	11/15/2018	Zero air pump	Teledyne	000774	701H	610

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	3817	PNF126	Eric Hebert	11/15/2018	DAS	Primary

Das Date: 11/15/2018 **Audit Date** 11/15/2018
Das Time: 10:48:00 **Audit Time** 10:48:00
Das Day: 319 **Audit Day** 319

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0001	0.0001	0.0001

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/24/2018	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.0999	V	V	-0.0001
7	0.3000	0.3001	0.3000	V	V	-0.0001
7	0.5000	0.5001	0.5001	V	V	0.0000
7	0.7000	0.7001	0.7001	V	V	0.0000
7	0.9000	0.9002	0.9001	V	V	-0.0001
7	1.0000	1.0002	1.0001	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	PNF126	Eric Hebert	11/15/2018	Flow Rate	000655

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
0.00%	0.00%			**Cal Factor Full Scale**	1.02
				Rotometer Reading:	1.55

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	test pt 1	1.507	1.500	1.48	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.504	1.500	1.47	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.501	1.500	1.47	0.000	1.50	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347316	PNF126	Eric Hebert	11/15/2018	Ozone	000741

Slope:	1.01013	**Slope:**	0.00000
Intercept	-0.33327	**Intercept**	0.00000
CorrCoff	0.99988	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.26	0.18	-0.93	ppb		-1.11
primary	2	14.73	14.61	14.46	ppb		-0.15
primary	3	35.67	35.48	36.53	ppb	2.92	
primary	4	69.11	68.81	69.34	ppb	0.77	
primary	5	108.11	107.69	108.00	ppb	0.29	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.40	pass
Span	1.003	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	78.6 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	624.7 mmHg	pass
Cell A Tmp.	33.5 C	pass
Cell B Freq.	108.4 kHz	pass
Cell B Noise	1.5 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	625.3 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	6701	PNF126	Eric Hebert	11/15/2018	Temperature	04687

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00757	**Intercept**	-0.09210
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.10	0.18		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.12	-0.03	0.000	0.0	C	0.06
primary	Temp Mid Range	26.64	26.53	0.000	26.5	C	-0.05
primary	Temp High Range	49.26	48.98	0.000	48.8	C	-0.18

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PNF126	Eric Hebert	11/15/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.05	0.07		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00757	Intercept	-0.09210
Cert Date	2/13/2018	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.83	23.74	0.000	23.7	C	-0.02
primary	Temp Mid Range	23.85	23.76	0.000	23.8	C	0.05
primary	Temp Mid Range	23.38	23.30	0.000	23.4	C	0.07

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	PNF126	Technician	Eric Hebert	Site Visit Date	11/15/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	PNF126	Eric Hebert	11/15/2018	Moisture Present	Apex	4015	☐	☐

The filter sample tubing has drops of moisture in low sections outside the shelter.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator was not available for the systems audit. The reported information was obtained from the site log and site documentation.

2 **Parameter:** DasComments

The sample towers are not grounded.

3 **Parameter:** SitingCriteriaCom

The site is in a mountain bowl. The wind pattern from this site would be expected to follow up and down slope patterns. The site is also located in a hay field which is cut 2 or 3 times per year.

4 **Parameter:** ShelterCleanNotes

The shelter is in fair condition.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PNF126	**Technician**	Eric Hebert	**Site Visit Date**	11/15/2018

Site Sponsor (agency)	EPA	**USGS Map**	Carvers Gap
Operating Group	USFS/private	**Map Scale**	
AQS #	37-011-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	8287331643	**Audit Latitude**	36.105435
Site Address 1	end of paved road	**Audit Longitude**	-82.045015
Site Address 2	Roaring Creek Road	**Audit Elevation**	1216
County	Avery	**Audit Declination**	-6.3
City, State	, NC		
Zip Code	28657	**Fire Extinguisher** (Present) ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☐	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☑	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition.				
Site OK	☑	**Notes**					

Driving Directions From Hwy 19E north of Plumb tree, turn west onto Roaring Creek Road. Follow the road to end of pavement always bearing right, and continue 200 meters. Site is off dirt road in the field on the right.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID PNF126 **Technician** Eric Hebert **Site Visit Date** 11/15/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m	5 m	☐
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The site is in a mountain bowl. The wind pattern from this site would be expected to follow up and down slope patterns. The site is also located in a hay field which is cut 2 or 3 times per year.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID PNF126 **Technician** Eric Hebert **Site Visit Date** 11/15/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID PNF126 **Technician** Eric Hebert **Site Visit Date** 11/15/2018

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	Temperature only
2	**Are all the meteorological sensors operational online, and reporting data?**	☑	Temperature only
3	**Are the shields for the temperature and RH sensors clean?**	☑	
4	**Are the aspirated motors working?**	☑	N/A
5	**Is the solar radiation sensor's lens clean and free of scratches?**	☑	N/A
6	**Is the surface wetness sensor grid clean and undamaged?**	☑	N/A
7	**Are the sensor signal and power cables intact, in good condition, and well maintained?**	☑	
8	**Are the sensor signal and power cable connections protected from the elements and well maintained?**	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	PNF126	Technician	Eric Hebert	Site Visit Date	11/15/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID PNF126 **Technician** Eric Hebert **Site Visit Date** 11/15/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☐
11	Tower comments?	Met tower removed	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The sample towers are not grounded.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	PNF126	Technician	Eric Hebert	Site Visit Date	11/15/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☑	☐	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☑	☐	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☑	☐	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☑	☐	☐
Temperature translator	☐	☐	☑	Filter flow pump	☑	☐	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☐	☑	☐
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☑	☐	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☑	☐	☐	Shelter air conditioner	☑	☐	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Oct 2015	☑
Field Ops Manual	☑	Oct 2015	☑
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	Minimal information
2	Are the Site Status Report Forms being completed and current?	☐	Ozone checks on filter off date
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID PNF126 **Technician** Eric Hebert **Site Visit Date** 11/15/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained in Gainesville in 1987
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☐
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, call-in

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID PNF126 **Technician** Eric Hebert **Site Visit Date** 11/15/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
2	Are the Site Status Report Forms being completed and filed correctly?	☐	Ozone checks on filter off date
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☐	
6	Are sample flow rates recorded? How?	☑	SSRF, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	One set of gloves only
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The site operator was not available for the systems audit. The reported information was obtained from the site log and site documentation.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID PNF126 **Technician** Eric Hebert **Site Visit Date** 11/15/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	0759
DAS	Campbell	CR3000	3817	illegible
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060400022677	06030
Flow Rate	Apex	AXMC105LPMDPC	illegible	000655
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844349884	06597
Ozone	ThermoElectron Inc	49i A1NAA	1105347316	000741
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124691	000363
Sample Tower	Aluma Tower	B	none	000178
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	6701	04687
Zero air pump	Teledyne	701H	610	000774
Zero air pump	Werther International	C 70/4	000814270	06885

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BEL116-Eric Hebert-11/17/2018						
1	11/17/2018	Computer	Dell	07005	Inspiron 15	Unknown
2	11/17/2018	DAS	Campbell	000341	CR3000	2120
3	11/17/2018	Elevation	Elevation	None	1	None
4	11/17/2018	Filter pack flow pump	Thomas	02755	107CAB18	1192001881
5	11/17/2018	Flow Rate	Apex	000596	AXMC105LPMDPCV	illegible
6	11/17/2018	Infrastructure	Infrastructure	none	none	none
7	11/17/2018	Met tower	Universal Tower	06484	unknown	none
8	11/17/2018	Modem	Raven	06475	H4222-C	0808311155
9	11/17/2018	Ozone	ThermoElectron Inc	000684	49i A1NAA	1030244795
10	11/17/2018	Ozone Standard	ThermoElectron Inc	000373	49i A3NAA	0726124685
11	11/17/2018	Precipitation	Texas Electronics	06332	TR-525i-HT	43527-807
12	11/17/2018	Relative Humidity	Vaisala	06010	HMP50UA	A1040002
13	11/17/2018	Sample Tower	Aluma Tower	000127	B	none
14	11/17/2018	Shelter Temperature	Campbell	none	107-L	44281
15	11/17/2018	Shield (10 meter)	RM Young	05042	Aspirated 43408	none
16	11/17/2018	Shield (2 meter)	RM Young	05041	Aspirated 43408	none
17	11/17/2018	Siting Criteria	Siting Criteria	None	1	None
18	11/17/2018	Solar Radiation	Licor	06959	LI-200	illegible
19	11/17/2018	Solar Radiation Translator	RM Young	03412	70101-X	none
20	11/17/2018	Surface Wetness	RM Young	04608	58101	none
21	11/17/2018	Temperature	RM Young	06308	41342VO	12533
22	11/17/2018	Temperature2meter	RM Young	05045	41342VO	9641
23	11/17/2018	Wind Direction	RM Young	04405	AQ05305	35870wdr
24	11/17/2018	Wind Speed	RM Young	04405	AQ05305	35870wsp
25	11/17/2018	Zero air pump	Werther International	06913	C 70/4	000829178

DAS Data Form

DAS Time Max Error: 0.05

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2120	BEL116	Eric Hebert	11/17/2018	DAS	Primary

Das Date: 11/17/2018 **Audit Date** 11/17/2018
Das Time: 10:00:03 **Audit Time** 10:00:00
Das Day: 321 **Audit Day** 321

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0000	0.0001	0.0000	0.0001

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000
Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/24/2018	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3001	0.3001	V	V	0.0000
7	0.5000	0.5001	0.5001	V	V	0.0000
7	0.7000	0.7002	0.7002	V	V	0.0000
7	0.9000	0.9003	0.9002	V	V	-0.0001
7	1.0000	1.0003	1.0002	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	BEL116	Eric Hebert	11/17/2018	Flow Rate	000596

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.04
1.12%	1.35%			**Cal Factor Full Scale**	1.02
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.05	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	-0.03	0.000	0.01	l/m	l/m	
primary	test pt 1	1.485	1.480	1.49	0.000	1.50	l/m	l/m	1.35%
primary	test pt 2	1.488	1.480	1.49	0.000	1.50	l/m	l/m	1.35%
primary	test pt 3	1.490	1.490	1.49	0.000	1.50	l/m	l/m	0.67%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	6.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 cm	**Status**	\
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244795	BEL116	Eric Hebert	11/17/2018	Ozone	000684

Slope:	0.99399	**Slope:**	0.00000
Intercept	-0.56529	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.06	-0.13	-0.72	ppb		-0.59
primary	2	14.50	14.38	13.80	ppb		-0.58
primary	3	36.45	36.26	35.35	ppb	-2.54	
primary	4	68.53	68.23	67.38	ppb	-1.25	
primary	5	111.91	111.48	110.20	ppb	-1.15	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.10	pass
Span	1.017	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	101.1 kHz	pass
Cell A Noise	1.8 ppb	pass
Cell A Flow	0.62 lpm	pass
Cell A Pressure	717.2 mmHg	pass
Cell A Tmp.	32.4 C	pass
Cell B Freq.	92.9 kHz	pass
Cell B Noise	2.1 ppb	pass
Cell B Flow	0.56 lpm	pass
Cell B Pressure	717.9 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	35870wsp	BEL116	Eric Hebert	11/17/2018	Wind Speed	04405

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA04013	**Tfer Desc.**	wind speed motor (l
Tfer ID	01254		
Slope	1.00000	**Intercept**	0.00000
Cert Date	7/11/2018	**CorrCoff**	1.00000

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA04013	**Tfer Desc.**	wind speed motor (h
Tfer ID	01253		
Slope	1.00000	**Intercept**	0.00000
Cert Date	7/11/2018	**CorrCoff**	1.00000

Prop or Cups SN	65736
Prop or Cups Torque	0.5 **to** 0.6
Prop Correction Fact	0.0512

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.05	0.00%		
Abs Max Er	0.19	0.00%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.0		-0.19	
primary	01254	200	1.02	0.0	1.0		0.00	
primary	01254	400	2.05	0.0	2.1		0.00	
primary	01254	800	4.10	0.0	4.1		0.00	
primary	01254	1200	6.14	0.0	6.1	0.00%		
primary	01254	2400	12.29	0.0	12.3	0.00%		
primary	01254	4000	20.48	0.0	20.5	0.00%		
primary	01254	9400	48.13	0.0	48.1	0.00%		

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	35870wdr	BEL116	Eric Hebert	11/17/2018	Wind Direction	04405

Mfg	RM Young	**Parameter**	wind direction
Serial Number	None	**Tfer Desc.**	wind direction wheel
Tfer ID	01252		
Slope	1.00000	**Intercept**	0.00000
Cert Date	4/26/2013	**CorrCoff**	1.00000

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	191832	**Tfer Desc.**	transit
Tfer ID	01272		
Slope	1.00000	**Intercept**	0.00000
Cert Date	5/10/2018	**CorrCoff**	1.00000

Vane SN: N/A **C. A. Align. deg. true:**

VaneTorque 8 **to** 12 180

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	3.5	0.9		
Abs Max Er	5	2		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01252	0	☑	0.000	355	5	42.9	##########
primary	01252	45	☑	0.000	40	6	44.5	-0.5
primary	01252	90	☑	0.000	85	5	45.2	##########
primary	01252	135	☑	0.000	129	6	44.3	##########
primary	01252	180	☑	0.000	175	5	46.2	##########
primary	01252	225	☑	0.000	222	4	46.3	##########
primary	01252	270	☑	0.000	268	2	46	1
primary	01252	315	☑	0.000	312	3	44.6	##########
primary	01272	90	☐	0.000	85	5		5
primary	01272	180	☐	0.000	175	5		5
primary	01272	270	☐	0.000	268	2		2
primary	01272	360	☐	0.000	2	2		2

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12533	BEL116	Eric Hebert	11/17/2018	Temperature	06308

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00757	**Intercept**	-0.09210
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.41	0.72		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.19	0.28	0.000	0.36	C	0.08
primary	Temp Mid Range	23.02	22.94	0.000	22.50	C	-0.44
primary	Temp High Range	49.17	48.89	0.000	48.17	C	-0.72

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	Functioning	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	9641	BEL116	Eric Hebert	11/17/2018	Temperature2meter	05045

Mfg	Extech	Parameter	Temperature
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00757	Intercept	-0.09210
Cert Date	2/13/2018	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.09	0.15		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.19	0.28	0.000	0.18	C	-0.1
primary	Temp Mid Rang	23.02	22.94	0.000	22.79	C	-0.15
primary	Temp High Rang	49.17	48.89	0.000	48.90	C	0.01

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Shield	Condition	Moderately clean	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	Blower Status Switch	Condition	N/A	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	A1040002	BEL116	Eric Hebert	11/17/2018	Relative Humidity	06010

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	124432	**Tfer Desc.**	Hygroclip
Tfer ID	01225		
Slope	0.94752	**Intercept**	-0.38371
Cert Date	11/17/2018	**CorrCoff**	0.99971

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	3.4			
Abs Max Er	5.0			

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	Hygroclip	32.8	30.4	32.8	0.000	36.8	4.0
primary	RH Low Range	Hygroclip	52.9	50.3	52.9	0.000	51.8	-1.1
primary	RH Low Range	Hygroclip	75.3	70.7	75.3	0.000	80.3	5.0

Sensor Component	RH Filter	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	illegible	BEL116	Eric Hebert	11/17/2018	Solar Radiation	06959

Mfg	RM Young	
SN/Owner ID	none	03412
Parameter	Solar Radiation Translator	

Mfg	Eppley	**Parameter**	solar radiation	
Serial Number	10765	**Tfer Desc.**	SR transfer translat	
Tfer ID	01246			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	2/14/2018	**CorrCoff**	1.00000	
Mfg	Eppley	**Parameter**	solar radiation	
Serial Number	34341F3	**Tfer Desc.**	SR transfer sensor	
Tfer ID	01245			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	2/14/2018	**CorrCoff**	1.00000	

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
4.5%	3.7%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	11/17/2018	12:00	384	384	393	2.3%
primary	11/17/2018	13:00	494	494	512	3.7%
primary	11/17/2018	14:00	453	453	479	5.7%
primary	11/17/2018	15:00	329	328	349	6.5%

Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Sensor Level	**Condition**	Level	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Texas Electronics	43527-807	BEL116	Eric Hebert	11/17/2018	Precipitation	06332

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
2.0%	4.0%		

Mfg	PMP	Parameter	Precipitation
Serial Number	None	Tfer Desc.	250ml graduate
Tfer ID	01249		
Slope	1.00000	Intercept	0.00000
Cert Date	4/26/2013	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	12 sec	0.50	0.52	in	in	ml	4.0%
primary	test 2	231.5	2	12 sec	0.50	0.50	in	in	ml	0.0%

Sensor Component	Properly Sited	Condition	45 degree rule	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Installed	Status	pass
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	Fail
Sensor Component	Gauge Clean	Condition	Moderately clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	unable to test	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Surface Wetness Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	BEL116	Eric Hebert	11/17/2018	Surface Wetness	04608

Mfg	Ohmite	**Parameter**	surface wetness
Serial Number	296-1200	**Tfer Desc.**	decade box
Tfer ID	01210		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/4/2011	**CorrCoff**	1.00000

☑ **Manual Test Pass**

UseDescription	Test Type	Tfer kOhms	OutputSignal	DAS eng	OutputSignalEngUni	TferUnits	OutputSignalUnit
primary	wet	N/A	1.015	1.01	V	N/A	V
primary	dry	N/A	0.003	0.01	V	N/A	V

Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	Grid Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Grid Angle	**Condition**	about 45 deg	**Status**	pass
Sensor Component	Grid Orientation	**Condition**	North	**Status**	pass
Sensor Component	Grid Condition	**Condition**	Fair	**Status**	pass
Sensor Component	Grid Type	**Condition**	Grid without holes	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	44281	BEL116	Eric Hebert	11/17/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.11	0.11		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00757	Intercept	-0.09210
Cert Date	2/13/2018	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.31	26.20	0.000	26.1	C	-0.11
primary	Temp Mid Range	26.26	26.15	0.000	26.1	C	-0.1

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
BEL116	Eric Hebert	11/17/2018

Shelter Make	Shelter Model	Shelter Size
Unknown	Unknown	Unknown

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Poor	Status	Fail
Sensor Component	Signal Cable	Condition	Fair	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Precipitation	BEL116	Eric Hebert	11/17/2018	Sensor Heater	Texas Electronic	2408	☐	☐
The tipping bucket rain gauge heater wires were found to be interfering with the operation of the tipping mechanism. The condition was corrected prior to the performance audit.								
Precipitation	BEL116	Eric Hebert	11/17/2018	Properly Sited	Texas Electronic	2408	☐	☐
Objects violate the 45 degree rule for the tipping bucket rain gage.								
Temperature	BEL116	Eric Hebert	11/17/2018	System Memo	RM Young	2405	☐	☐
The sensor signal cables are showing signs of wear.								

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is located between Washington DC and Baltimore, MD near a major transportation corridor. Although the site surroundings are woodland and agriculture, the region surrounding the research center is densely populated and urban.

2 **Parameter:** MetSensorComme

The trees are beginning to encroach on the lower temperature sensor.

3 **Parameter:** MetOpMaintCom

The outer insulation of both temperature sensor signal cables is broken. The 10 meter temperature sensor signal cable has been spliced.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	BEL116	**Technician**	Eric Hebert	**Site Visit Date**	11/17/2018

Site Sponsor (agency)	EPA	**USGS Map**	Laurel
Operating Group	BARC/private	**Map Scale**	
AQS #	24-033-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, SO2, NOy, NOx, CO, Hg	**QAPP Latitude**	39.0283
Deposition Measurement	dry, wet, Hg	**QAPP Longitude**	-76.8175
Land Use	urban - agriculture	**QAPP Elevation Meters**	46
Terrain	flat	**QAPP Declination**	11.25
Conforms to MLM	No	**QAPP Declination Date**	2/23/2006
Site Telephone	(301) 474-3019	**Audit Latitude**	39.028177
Site Address 1	BARC old airport	**Audit Longitude**	-76.817127
Site Address 2	Springfield Road	**Audit Elevation**	47
County	Prince George's	**Audit Declination**	-11
City, State	Laurel, MD		
Zip Code	20708	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☑	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Unknown	**Model**	Unknown	**Shelter Size**	Unknown
Shelter Clean	☑	**Notes**					
Site OK	☑	**Notes**					

Driving Directions

From the Baltimore - Washington Parkway (route 295) take exit 11(Powder Mill Road). Go east for approximately 0.5 miles and turn right (south) onto Springfield Road. Continue approximately 0.8 miles and look for a gate on the left. The site is on the right of the dirt road approximately 1 mile through the two gates.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/17/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km	25 km	☐
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The site is located between Washington DC and Baltimore, MD near a major transportation corridor. Although the site surroundings are woodland and agriculture, the region surrounding the research center is densely populated and urban.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	11/17/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	
3	Are the tower and sensors plumb?	☑	
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	
8	Is the rain gauge plumb?	☑	
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	
11	Is it inclined approximately 30 degrees?	☑	About 45 degrees

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The trees are beginning to encroach on the lower temperature sensor.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/17/2018

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	
2	**Are all the meteorological sensors operational online, and reporting data?**	☑	
3	**Are the shields for the temperature and RH sensors clean?**	☑	
4	**Are the aspirated motors working?**	☑	
5	**Is the solar radiation sensor's lens clean and free of scratches?**	☑	
6	**Is the surface wetness sensor grid clean and undamaged?**	☑	
7	**Are the sensor signal and power cables intact, in good condition, and well maintained?**	☑	Signs of wear
8	**Are the sensor signal and power cable connections protected from the elements and well maintained?**	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The outer insulation of both temperature sensor signal cables is broken. The 10 meter temperature sensor signal cable has been spliced.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	11/17/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 15 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/17/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?		

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	11/17/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☑	☐	Data logger	☐	☑	☐
Wind direction sensor	☐	☑	☐	Data logger	☐	☐	☑
Temperature sensor	☐	☑	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☑	☐	Computer	☑	☐	☐
Solar radiation sensor	☑	☐	☐	Modem	☐	☑	☐
Surface wetness sensor	☐	☑	☐	Printer	☐	☐	☑
Wind sensor translator	☐	☑	☐	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☑	☐	UPS	☐	☑	☐
Tipping bucket rain gauge	☐	☑	☐	Lightning protection device	☐	☐	☑
Ozone analyzer	☑	☐	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☑	☐	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Feb 2014	☑
HASP	☑	Oct 2015	☑
Field Ops Manual	☑	Oct 2015	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/17/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by previous site operator
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	Weekly	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	Weekly	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☐
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, call-in

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/17/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean glove on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S10-rev002

Site ID BEL116 **Technician** Eric Hebert **Site Visit Date** 11/17/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07005
DAS	Campbell	CR3000	2120	000341
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	1192001881	02755
Flow Rate	Apex	AXMC105LPMDPC	illegible	000596
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	06484
Modem	Raven	H4222-C	0808311155	06475
Ozone	ThermoElectron Inc	49i A1NAA	1030244795	000684
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124685	000373
Precipitation	Texas Electronics	TR-525i-HT	43527-807	06332
Relative Humidity	Vaisala	HMP50UA	A1040002	06010
Sample Tower	Aluma Tower	B	none	000127
Shelter Temperature	Campbell	107-L	44281	none
Shield (10 meter)	RM Young	Aspirated 43408	none	05042
Shield (2 meter)	RM Young	Aspirated 43408	none	05041
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	illegible	06959
Solar Radiation Translator	RM Young	70101-X	none	03412
Surface Wetness	RM Young	58101	none	04608
Temperature	RM Young	41342VO	12533	06308
Temperature2meter	RM Young	41342VO	9641	05045
Wind Direction	RM Young	AQ05305	35870wdr	04405
Wind Speed	RM Young	AQ05305	35870wsp	04405
Zero air pump	Werther International	C 70/4	000829178	06913

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DUK008-Eric Hebert-12/05/2018						
1	12/5/2018	DAS	Campbell	000818	CR850	29012
2	12/5/2018	Flow Rate	Apex	000664	AXMC105LPMDPCV	illegible
3	12/5/2018	Modem	Sierra wireless	06998	GX440	Unknown
4	12/5/2018	Temperature	RM Young	06987	41342VC	024331

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	DUK008	Eric Hebert	12/05/2018	Flow Rate	000664

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
1.35%	1.35%			**Cal Factor Full Scale**	0
				Rotometer Reading:	1.45

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	test pt 1	1.484	1.480	1.50	0.000	1.50	l/m	l/m	1.35%
primary	test pt 2	1.487	1.480	1.51	0.000	1.50	l/m	l/m	1.35%
primary	test pt 3	1.482	1.480	1.50	0.000	1.50	l/m	l/m	1.35%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	024331	DUK008	Eric Hebert	12/05/2018	Temperature	06987

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00757	**Intercept**	-0.09210
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.52	0.72		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.10	0.19	0.000	0.0	C	-0.17
primary	Temp Mid Range	25.71	25.61	0.000	24.9	C	-0.72
primary	Temp Mid Range	25.55	25.45	0.000	24.9	C	-0.55
primary	Temp High Range	47.51	47.24	0.000	46.6	C	-0.66

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Field Systems Comments

1 **Parameter:** DasComments

All measurements (temperature and flow rate) are being made above tree canopy approximately 30 meters above ground. There are no CASTNET ozone measurements at this time. The site is considered a small footprint site with logger and flow system on the walk-up tower.

2 **Parameter:** DocumentationCo

The site operator was completing the SSRF observation section on the day of filter removal rather than the installation day.

3 **Parameter:** SitingCriteriaCom

The station measurements are being mace above the tree canopy in the Duke Experimental Forest near Durham, NC.

4 **Parameter:** ShelterCleanNotes

The shelter is custom built and in very good condition.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	DUK008	**Technician**	Eric Hebert	**Site Visit Date**	12/05/2018

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	EPA	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type			
Air Pollutant Analyzer		**QAPP Latitude**	
Deposition Measurement		**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	35.9745
Site Address 1		**Audit Longitude**	-79.099
Site Address 2		**Audit Elevation**	164
County	Orange	**Audit Declination**	
City, State	, NC		**Present**
Zip Code		**Fire Extinguisher**	☑
Time Zone	Eastern	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☑
Backup Operator		**Security Fence**	☑
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Shelter Working Room	☑	**Make**	Custom	**Model**	Unknown	**Shelter Size**	
Shelter Clean	☑	**Notes**	The shelter is custom built and in very good condition.				
Site OK	☑	**Notes**					
Driving Directions							

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID DUK008 **Technician** Eric Hebert **Site Visit Date** 12/05/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The station measurements are being mace above the tree canopy in the Duke Experimental Forest near Durham, NC.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	DUK008	Technician	Eric Hebert	Site Visit Date	12/05/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	Temperature only
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	Temperature only
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID DUK008 **Technician** Eric Hebert **Site Visit Date** 12/05/2018

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	Temperature only
2	**Are all the meteorological sensors operational online, and reporting data?**	☑	Temperature only
3	**Are the shields for the temperature and RH sensors clean?**	☑	Temperature only
4	**Are the aspirated motors working?**	☑	N/A
5	**Is the solar radiation sensor's lens clean and free of scratches?**	☑	N/A
6	**Is the surface wetness sensor grid clean and undamaged?**	☑	N/A
7	**Are the sensor signal and power cables intact, in good condition, and well maintained?**	☑	
8	**Are the sensor signal and power cable connections protected from the elements and well maintained?**	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID DUK008 **Technician** Eric Hebert **Site Visit Date** 12/05/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☐	30 meters above ground
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	N/A
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	N/A
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		1/4 teflon by 5 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	N/A
8	Are there moisture traps in the sample lines?	☑	N/A
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID DUK008 **Technician** Eric Hebert **Site Visit Date** 12/05/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	N/A

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?		

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

All measurements (temperature and flow rate) are being made above tree canopy approximately 30 meters above ground. There are no CASTNET ozone measurements at this time. The site is considered a small footprint site with logger and flow system on the walk-up tower.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID DUK008 **Technician** Eric Hebert **Site Visit Date** 12/05/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☐	☑	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☐	☑	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☐	☐	☑
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☐	☑
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☐	☑
Solar radiation translator	☐	☐	☑	UPS	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☐	☐	☑	Shelter heater	☐	☐	☑
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☐	☐	☑
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☐		☐
SSRF	☐		☐
Site Ops Manual	☐		☐
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☐	There is no site logbook
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The site operator was completing the SSRF observation section on the day of filter removal rather than the installation day.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID DUK008 **Technician** Eric Hebert **Site Visit Date** 12/05/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	N/A	☐
Visual Inspections	☑	N/A	☐
Translator Zero/Span Tests (climatronics)	☑	N/A	☐
Manual Rain Gauge Test	☑	N/A	☐
Confirm Reasonableness of Current Values	☑	Daily	☐
Test Surface Wetness Response	☑	N/A	☐

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	N/A	☐
Automatic Zero/Span Tests	☑	N/A	☐
Manual Zero/Span Tests	☑	N/A	☐
Automatic Precision Level Tests	☑	N/A	☐
Manual Precision Level Test	☑	N/A	☐
Analyzer Diagnostics Tests	☑	N/A	☐
In-line Filter Replacement (at inlet)	☑	N/A	☐
In-line Filter Replacement (at analyze	☑	N/A	☐
Sample Line Check for Dirt/Water	☑	N/A	☐
Zero Air Desiccant Check	☑	N/A	☐

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	N/A
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	N/A
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID DUK008 **Technician** Eric Hebert **Site Visit Date** 12/05/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	email

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S10-rev002

Site ID DUK008 **Technician** Eric Hebert **Site Visit Date** 12/05/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	29012	000818
Flow Rate	Apex	AXMC105LPMDPC	illegible	000664
Modem	Sierra wireless	GX440	Unknown	06998
Temperature	RM Young	41342VC	024331	06987

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
COW137-Sandy Grenville-12/06/2018						
1	12/6/2018	Computer	Dell	07049	Inspiron 15	1K2MC12
2	12/6/2018	DAS	Campbell	000401	CR3000	2529
3	12/6/2018	elevation	Elevation	none	1	None
4	12/6/2018	Filter pack flow pump	Thomas	02758	107CAB18	001871
5	12/6/2018	Flow Rate	Apex	000467	AXMC105LPMDPCV	43973
6	12/6/2018	Infrastructure	Infrastructure	none	none	none
7	12/6/2018	Modem	Raven	06806	V4221-V	0936444095
8	12/6/2018	Ozone	ThermoElectron Inc	000726	49i A1NAA	1105347314
9	12/6/2018	Ozone Standard	ThermoElectron Inc	000441	49i A3NAA	CM08200017
10	12/6/2018	Sample Tower	Aluma Tower	03499	A	none
11	12/6/2018	Shelter Temperature	Campbell	none	107-L	none
12	12/6/2018	Siting Criteria	Siting Criteria	None	1	None
13	12/6/2018	Temperature	RM Young	02934	41342	none
14	12/6/2018	UPS	APC	none	650	unknown
15	12/6/2018	Zero air pump	Werther International	06940	C 70/4	000821897

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2529	COW137	Sandy Grenville	12/06/2018	DAS	Primary

Das Date: 12/6 /2018
Das Time: 15:59:20
Das Day: 340

Audit Date 12/6 /2018
Audit Time 15:59:21
Audit Day 340

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0005	0.0001	0.0005

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2018	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2996	0.2997	V	V	0.0001
7	0.5000	0.4995	0.4990	V	V	-0.0005
7	0.7000	0.6994	0.6994	V	V	0.0000
7	0.9000	0.8993	0.8992	V	V	-0.0001
7	1.0000	0.9992	0.9991	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	43973	COW137	Sandy Grenville	12/06/2018	Flow Rate	000467

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 220-H
Tfer ID	01414		
Slope	1.00055	**Intercept**	-0.01570
Cert Date	2/21/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
2.60%	3.23%			**Cal Factor Full Scale**	1
				Rotometer Reading:	1.6

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	-0.01	l/m	l/m	
primary	test pt 1	1.514	1.530	1.50	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 2	1.532	1.550	1.51	0.000	1.50	l/m	l/m	-3.23%
primary	test pt 3	1.530	1.540	1.50	0.000	1.50	l/m	l/m	-2.60%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347314	COW137	Sandy Grenville	12/06/2018	Ozone	000726

Slope:	0.99914	**Slope:**	0.00000
Intercept	-0.12425	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.27	0.15	0.07	ppb		-0.08
primary	2	16.57	16.41	16.12	ppb		-0.29
primary	3	35.52	35.30	35.13	ppb	-0.48	
primary	4	67.78	67.47	67.53	ppb	0.09	
primary	5	111.68	111.24	110.90	ppb	-0.31	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	Not functioning	Fail
Offset	0.02	pass
Span	1.020	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	109.3 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	673.2 mmHg	pass
Cell A Tmp.	36.2 C	pass
Cell B Freq.	86.8 kHz	pass
Cell B Noise	0.4 ppb	pass
Cell B Flow	0.62 lpm	pass
Cell B Pressure	673.8 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	COW137	Sandy Grenville	12/06/2018	Temperature	02934

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00798	**Intercept**	0.09168
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.07	0.10		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.17	0.08	0.000	0.2	C	0.1
primary	Temp Mid Range	25.05	24.76	0.000	24.7	C	-0.02
primary	Temp High Range	48.97	48.49	0.000	48.4	C	-0.09

Sensor Component	Shield	**Condition**	Dirty	**Status**	Fail
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	COW137	Sandy Grenville	12/06/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.08	1.16		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00798	Intercept	0.09168
Cert Date	2/13/2018	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	17.18	16.95	0.000	18.1	C	1.16
primary	Temp Mid Range	26.66	26.36	0.000	25.2	C	-1.12
primary	Temp Mid Range	27.23	26.92	0.000	26.0	C	-0.97

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	COW137	Technician	Sandy Grenville	Site Visit Date	12/06/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Field Systems Comments

1 **Parameter:** DasComments

The met tower has been removed and a new sample tower has been installed.

2 **Parameter:** SitingCriteriaCom

Construction was completed on new building with a parking lot, in October 2004. The parking area is within 60 meters of the site.

3 **Parameter:** ShelterCleanNotes

The shelter walls and floor have been replaced since the previous audit. There are some wet spots from an apparent leak near the north and south walls.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	COW137	**Technician**	Sandy Grenville	**Site Visit Date**	12/06/2018

Site Sponsor (agency)	EPA/USFS	**USGS Map**	Prentiss
Operating Group	USFS	**Map Scale**	
AQS #	37-113-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	8283697919	**Audit Latitude**	35.060527
Site Address 1	Southeastern Forest Experiment Statio	**Audit Longitude**	-83.43034
Site Address 2	3160 Coweeta Lab Road	**Audit Elevation**	683
County	Macon	**Audit Declination**	-5.1
City, State	, NC		
Zip Code	28763	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter walls and floor have been replaced since the previous audit. There are some wet spots from an apparent leak near the north and south walls.				
Site OK	☑	**Notes**					

Driving Directions

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 12/06/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m	60 m	☐
Tree line	50 m	40 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Construction was completed on new building with a parking lot, in October 2004. The parking area is within 60 meters of the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 12/06/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 12/06/2018

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	Temperature only
2	**Are all the meteorological sensors operational online, and reporting data?**	☑	Temperature only
3	**Are the shields for the temperature and RH sensors clean?**	☑	
4	**Are the aspirated motors working?**	☑	
5	**Is the solar radiation sensor's lens clean and free of scratches?**	☑	N/A
6	**Is the surface wetness sensor grid clean and undamaged?**	☑	N/A
7	**Are the sensor signal and power cables intact, in good condition, and well maintained?**	☑	
8	**Are the sensor signal and power cable connections protected from the elements and well maintained?**	☑	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	COW137	Technician	Sandy Grenville	Site Visit Date	12/06/2018

Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☑	

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 12/06/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑
11	Tower comments?	Met tower removed	

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The met tower has been removed and a new sample tower has been installed.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 12/06/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A		Yes	No	N/A
Wind speed sensor	☐	☐	☑	Data logger	☐	☑	☐
Wind direction sensor	☐	☐	☑	Data logger	☐	☐	☑
Temperature sensor	☐	☑	☐	Strip chart recorder	☐	☐	☑
Relative humidity sensor	☐	☐	☑	Computer	☐	☑	☐
Solar radiation sensor	☐	☐	☑	Modem	☐	☑	☐
Surface wetness sensor	☐	☐	☑	Printer	☐	☐	☑
Wind sensor translator	☐	☐	☑	Zero air pump	☐	☑	☐
Temperature translator	☐	☐	☑	Filter flow pump	☐	☑	☐
Humidity sensor translator	☐	☐	☑	Surge protector	☐	☑	☐
Solar radiation translator	☐	☐	☑	UPS	☐	☑	☐
Tipping bucket rain gauge	☐	☐	☑	Lightning protection device	☐	☐	☑
Ozone analyzer	☑	☐	☐	Shelter heater	☐	☑	☐
Filter pack flow controller	☐	☑	☐	Shelter air conditioner	☐	☑	☐
Filter pack MFC power supply	☐	☐	☑				

Does the site have the required and most recent QC documents and report forms?

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Feb 2014	☐
HASP	☑	Feb 2014	☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	Minimal information
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	COW137	Technician	Sandy Grenville	Site Visit Date	12/06/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

Are regular operational QA/QC checks performed on meteorological instruments?

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	N/A	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	N/A	☑
Test Surface Wetness Response	☑	N/A	☑

Are regular operational QA/QC checks performed on the ozone analyzer?

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	As needed	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	As needed	☑
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	Call-in only

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 12/06/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S10-rev002

Site ID COW137 **Technician** Sandy Grenville **Site Visit Date** 12/06/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	1K2MC12	07049
DAS	Campbell	CR3000	2529	000401
elevation	Elevation	1	None	none
Filter pack flow pump	Thomas	107CAB18	001871	02758
Flow Rate	Apex	AXMC105LPMDPC	43973	000467
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0936444095	06806
Ozone	ThermoElectron Inc	49i A1NAA	1105347314	000726
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200017	000441
Sample Tower	Aluma Tower	A	none	03499
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	none	02934
UPS	APC	650	unknown	none
Zero air pump	Werther International	C 70/4	000821897	06940

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 4/1/2019 6:50:06 PM

SiteVisitDate	Site	Technician
11/08/2018	ABT147	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.11	c	**P**
2	Temperature max error	P	4	0.5	3	0.16	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00265	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.47031	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.9	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.83	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.02	ppb	**P**
9	Ozone % difference max	P	7	10	4	1.8	%	**P**
10	Flow Rate average % difference	P	10	5	4	26.11	%	**Fail**
11	Flow Rate max % difference	P	10	5	4	26.11	%	**Fail**
12	DAS Voltage average error	P	7	0.003	56	0.0001	V	**P**
13	Shelter Temperature average error	P	5	2	15	0.14	c	**P**
14	Shelter Temperature max error	P	5	2	15	0.17	c	**P**

SiteVisitDate	Site	Technician
11/08/2018	ABT147	Eric Hebert

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Moisture Present **CommentCode** 72

The filter sample tubing has drops of moisture in low sections outside the shelter.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator reported that the "filter time off" field on the SSRF form should be the time that the filter is removed from the tower rather than the time that the filter flow pump is turned off.

2 **Parameter:** DasComments

The met tower has been removed.

3 **Parameter:** DocumentationCo

All site instrument manuals are on the site computer desktop folder.

4 **Parameter:** SitingCriteriaCom

Manure is routinely spread on the hay fields surrounding the site during the summer.

5 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

6 **Parameter:** MetSensorComme

Temperature mounted in naturally aspirated shield on sample tower.

EEMS Spot Report

Data Compiled: 4/2/2019 10:58:31 AM

SiteVisitDate	Site	Technician
10/03/2018	ACA416	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.14	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.26	c	**P**
3	Wind Speed average error below 5m/s in m/s	P	3	0.5	8	0.32	m/s	**P**
4	Wind Speed max error below 5m/s in m/s	P	3	0.5	8	0.56	m/s	**Fail**
5	Wind Speed average % difference above 5 m/s	P	3	5	8	8.2	%	**Fail**
6	Wind Speed max % difference above 5 m/s	P	3	5	8	26.2	%	**Fail**
7	Wind Speed Torque average error	P	3	0.5	1	0.20	g-cm	**P**
8	Wind Speed Torque max error	P	3	0.5	1	0.2	g-cm	**P**
9	Wind Direction Input Deg True average error (de	P	2	5	8	3.8	degrees	**P**
10	Wind Direction Input Deg True max error (deg)	P	2	5	8	6	degrees	**Fail**
11	Wind Direction Linearity average error (deg)	P	2	5	16	1.9	degrees	**P**
12	Wind Direction Linearity max error (deg)	P	2	5	16	6	degrees	**Fail**
13	Wind Direction Torque average error	P	2	30	1	8	g-cm	**P**
14	Wind Direction Torque max error	P	2	30	1	12	g-cm	**P**
15	Relative Humidity average below 85%	P	6	10	6	2.4	%	**P**
16	Relative Humidity max below 85%	P	6	10	6	3.7	%	**P**
17	Solar Radiation % diff of avg	P	9	10	16	0.80	%	**P**
18	Solar Radiation % diff of max STD value	P	9	10	16	2.7	%	**P**
19	Precipitation average % difference	P	1	10	2	6.0	%	**P**
20	Precipitation max % difference	P	1	10	2	6.0	%	**P**
21	Ozone Slope	P	0	1.1	4	1.05148	unitless	**P**
22	Ozone Intercept	P	0	5	4	0.62233	ppb	**P**
23	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
24	Ozone % difference avg	P	7	10	4	6.8	%	**P**
25	Ozone Absolute Difference g1	P	7	3	1	0.61	ppb	**P**
26	Ozone Absolute Difference g2	P	7	1.5	1	1.15	ppb	**P**
27	Ozone % difference max	P	7	10	4	8.0	%	**P**
28	DAS Voltage average error	P	13	0.003	7	0.0003	V	**P**
29	Shelter Temperature average error	P	5	2	6	0.28	c	**P**
30	Shelter Temperature max error	P	5	2	6	0.39	c	**P**

SiteVisitDate	Site	Technician
10/03/2018	ACA416	Eric Hebert

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

This site is operated by both the NPS and the State of Maine DEP. It is not visited by ARS for semiannual calibration and maintenance visits. The site operator does not perform many of the routine checks conducted at other CASTNET sites, such as tip checks, wetness sensor tests, and visual checks of the blowers. The state of Maine personnel maintain the meteorological systems and the ozone monitor.

2 **Parameter:** SiteOpsProcedures

The meteorological and ozone instrument checks and maintenance are performed by the State of Maine DEP.

3 **Parameter:** ShelterCleanNotes

The shelter is new, clean and well organized.

4 **Parameter:** PollAnalyzerCom

New sample lines have been installed in the new shelter.

5 **Parameter:** MetSensorComme

The wind speed sensor response at the high speed test was much lower than expected. This condition has been observed during previous audits.

6 **Parameter:** MetOpMaintCom

The sensor signal cables are beginning to show signs of wear.

EEMS Spot Report

Data Compiled: 3/13/2019 8:24:06 PM

SiteVisitDate	Site	Technician
10/20/2018	ALH157	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98941	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.29214	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.13	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.05	ppb	**P**
7	Ozone % difference max	P	7	10	4	1.2	%	**P**

EEMS Spot Report

Data Compiled: 4/2/2019 11:21:13 AM

SiteVisitDate	Site	Technician
10/04/2018	ASH135	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	18	0.07	c	**P**
2	Temperature max error	P	4	0.5	18	0.13	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97553	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.19571	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.52	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.44	ppb	**P**
9	Ozone % difference max	P	7	10	4	3.1	%	**P**
10	Flow Rate average % difference	P	10	5	2	1.1	%	**P**
11	Flow Rate max % difference	P	10	5	2	1.32	%	**P**
12	DAS Voltage average error	P	7	0.003	28	0.0000	V	**P**
13	Shelter Temperature average error	P	5	2	18	0.60	c	**P**
14	Shelter Temperature max error	P	5	2	18	0.66	c	**P**

SiteVisitDate	Site	Technician
10/04/2018	ASH135	Eric Hebert

Field Systems Comments

1 **Parameter:** DasComments

The met tower has been removed and the 10 meter temperature sensor is mounted in a naturally aspirated shield on the sample tower.

2 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the sample train is leak tested once each month.

3 **Parameter:** SitingCriteriaCom

The evergreen plantation previously 20 meters south of the site has been harvested.

4 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, clean, and very well organized. Rot is beginning at the bottom of the walls and floor.

EEMS Spot Report

Data Compiled: 4/1/2019 8:14:21 PM

SiteVisitDate	Site	Technician
11/17/2018	BEL116	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.09	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.15	c	**P**
3	Surface Wetness Wetness Sensor		0		1	0		
4	Wind Speed average error below 5m/s in m/s	P	3	0.5	12	0.05	m/s	**P**
5	Wind Speed max error below 5m/s in m/s	P	3	0.5	12	0.19	m/s	**P**
6	Wind Speed average % difference above 5 m/s	P	3	5	12	0.0	%	**P**
7	Wind Speed max % difference above 5 m/s	P	3	5	12	0.0	%	**P**
8	Wind Speed Torque average error	P	3	0.5	1	0.55	g-cm	**Fail**
9	Wind Speed Torque max error	P	3	0.5	1	0.6	g-cm	**Fail**
10	Wind Direction Input Deg True average error (de	P	2	5	12	3.5	degrees	**P**
11	Wind Direction Input Deg True max error (deg)	P	2	5	12	5	degrees	**P**
12	Wind Direction Linearity average error (deg)	P	2	5	24	0.9	degrees	**P**
13	Wind Direction Linearity max error (deg)	P	2	5	24	2	degrees	**P**
14	Wind Direction Torque average error	P	2	30	1	10	g-cm	**P**
15	Wind Direction Torque max error	P	2	30	1	12	g-cm	**P**
16	Temperature average error	P	4	0.5	18	0.41	c	**P**
17	Temperature max error	P	4	0.5	18	0.72	c	**Fail**
18	Relative Humidity average below 85%	P	6	10	6	3.4	%	**P**
19	Relative Humidity max below 85%	P	6	10	6	5.0	%	**P**
20	Solar Radiation % diff of avg	P	9	10	4	4.48	%	**P**
21	Solar Radiation % diff of max STD value	P	9	10	4	3.7	%	**P**
22	Precipitation average % difference	P	1	10	2	2.0	%	**P**
23	Precipitation max % difference	P	1	10	2	4.0	%	**P**
24	Ozone Slope	P	0	1.1	4	0.99399	unitless	**P**
25	Ozone Intercept	P	0	5	4	-0.56529	ppb	**P**
26	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
27	Ozone % difference avg	P	7	10	4	2.2	%	**P**
28	Ozone Absolute Difference g1	P	7	3	1	-0.59	ppb	**P**
29	Ozone Absolute Difference g2	P	7	1.5	1	-0.58	ppb	**P**
30	Ozone % difference max	P	7	10	4	4.0	%	**P**
31	Flow Rate average % difference	P	10	5	4	1.12	%	**P**
32	Flow Rate max % difference	P	10	5	4	1.35	%	**P**
33	DAS Voltage average error	P	7	0.003	70	0.0000	V	**P**

SiteVisitDate	Site	Technician
11/17/2018	BEL116	Eric Hebert

34	Surface Wetness Response	P	12	0.5	1	1.01		**P**
35	Shelter Temperature average error	P	5	2	12	0.10	c	**P**
36	Shelter Temperature max error	P	5	2	12	0.11	c	**P**

SiteVisitDate	Site	Technician
11/17/2018	BEL116	Eric Hebert

Field Performance Comments

1 **Parameter:** Precipitation **SensorComponent:** Sensor Heater **CommentCode** 108

The tipping bucket rain gauge heater wires were found to be interfering with the operation of the tipping mechanism. The condition was corrected prior to the performance audit.

2 **Parameter:** Precipitation **SensorComponent:** Properly Sited **CommentCode** 193

Objects violate the 45 degree rule for the tipping bucket rain gage.

3 **Parameter:** Temperature **SensorComponent:** System Memo **CommentCode** 4

The sensor signal cables are showing signs of wear.

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is located between Washington DC and Baltimore, MD near a major transportation corridor. Although the site surroundings are woodland and agriculture, the region surrounding the research center is densely populated and urban.

2 **Parameter:** MetSensorComme

The trees are beginning to encroach on the lower temperature sensor.

3 **Parameter:** MetOpMaintCom

The outer insulation of both temperature sensor signal cables is broken. The 10 meter temperature sensor signal cable has been spliced.

EEMS Spot Report

Data Compiled: 3/14/2019 11:23:11 AM

SiteVisitDate	Site	Technician
11/11/2018	BVL130	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98685	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.87873	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.6	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.98	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.83	ppb	**P**
7	Ozone % difference max	P	7	10	4	5.8	%	**P**

EEMS Spot Report

Data Compiled: 3/14/2019 11:56:00 AM

SiteVisitDate	Site	Technician
11/16/2018	BWR139	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.03497	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.85768	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.4	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-1.81	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.39	ppb	**P**
7	Ozone % difference max	P	7	10	4	10.2	%	**Fail**

EEMS Spot Report

Data Compiled: 4/1/2019 5:45:57 PM

SiteVisitDate	Site	Technician
11/07/2018	CAT175	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	18	0.15	c	**P**
2	Temperature max error	P	4	0.5	18	0.16	c	**P**
3	Flow Rate average % difference	P	10	5	4	0.99	%	**P**
4	Flow Rate max % difference	P	10	5	4	1.18	%	**P**

SiteVisitDate	Site	Technician
11/07/2018	CAT175	Eric Hebert

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Moisture Present **CommentCode** 72

The filter sample tubing has drops of moisture in low sections outside the shelter.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The SSRF forms are not complete.

2 **Parameter:** DasComments

The shelter is not temperature controlled. The site is solar and DC battery powered. The met tower has been removed and the temperature is being measured from the sample tower at 10 meters above ground.

3 **Parameter:** DocumentationCo

The site copies of the SSRF are no longer kept onsite.

4 **Parameter:** ShelterCleanNotes

The shelter is seriously deteriorated with rot and mold on the floor and walls. There are many unused and possibly depleted batteries stored in the shelter. The vegetation has been allowed to grow. The shelter roof has been repaired.

5 **Parameter:** PollAnalyzerCom

Ozone monitoring is no longer being conducted at the site.

EEMS Spot Report

Data Compiled: 3/14/2019 12:51:32 PM

SiteVisitDate	Site	Technician
12/05/2018	CND125	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97813	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.17465	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.49	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.07	ppb	**P**
7	Ozone % difference max	P	7	10	4	3.2	%	**P**

EEMS Spot Report

Data Compiled: 3/23/2019 1:17:57 PM

SiteVisitDate	Site	Technician
12/06/2018	COW137	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	12	0.07	c	**P**
2	Temperature max error	P	4	0.5	12	0.10	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99914	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.12425	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.7	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.08	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.29	ppb	**P**
9	Ozone % difference max	P	7	10	4	1.8	%	**P**
10	Flow Rate average % difference	P	10	5	6	2.59	%	**P**
11	Flow Rate max % difference	P	10	5	6	3.23	%	**P**
12	DAS Voltage average error	P	7	0.003	63	0.0001	V	**P**
13	Shelter Temperature average error	P	5	2	15	1.08	c	**P**
14	Shelter Temperature max error	P	5	2	15	1.16	c	**P**

SiteVisitDate	Site	Technician
12/06/2018	COW137	Sandy Grenville

Field Systems Comments

1 **Parameter:** DasComments

The met tower has been removed and a new sample tower has been installed.

2 **Parameter:** SitingCriteriaCom

Construction was completed on new building with a parking lot, in October 2004. The parking area is within 60 meters of the site.

3 **Parameter:** ShelterCleanNotes

The shelter walls and floor have been replaced since the previous audit. There are some wet spots from an apparent leak near the north and south walls.

EEMS Spot Report

Data Compiled: 3/14/2019 11:44:52 AM

SiteVisitDate	Site	Technician
11/14/2018	DCP114	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01609	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.37187	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.6	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.01	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	1.17	ppb	**P**
7	Ozone % difference max	P	7	10	4	8.0	%	**P**

EEMS Spot Report

Data Compiled: 4/2/2019 9:53:46 AM

SiteVisitDate	Site	Technician
10/10/2018	DEN417	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.18	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.26	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00467	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.05102	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.5	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-1.3	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.54	ppb	**P**
9	Ozone % difference max	P	7	10	4	3.8	%	**P**
10	Flow Rate average % difference	P	10	5	8	1.93	%	**P**
11	Flow Rate max % difference	P	10	5	8	2.07	%	**P**
12	DAS Voltage average error	P	7	0.003	70	0.0002	V	**P**
13	Shelter Temperature average error	P	5	2	18	0.58	c	**P**
14	Shelter Temperature max error	P	5	2	18	0.97	c	**P**

SiteVisitDate	Site	Technician
10/10/2018	DEN417	Martin Valvur

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Filter Position **CommentCode** 71

The filter attachment plate is mounted too low in the enclosure resulting in the filter being exposed to wind-driven rain and in the standard geometric orientation.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator uses one gloved hand, and the same glove, to remove and install the filter pack. Leak checks are performed when the ambient temperature is above -10 C.

2 **Parameter:** ShelterCleanNotes

The shelter is in good condition, clean, neat, and very well organized.

EEMS Spot Report

Data Compiled: 4/2/2019 12:35:57 PM

SiteVisitDate	Site	Technician
12/05/2018	DUK008	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	4	0.53	c	**Fail**
2	Temperature max error	P	4	0.5	4	0.72	c	**Fail**
3	Flow Rate average % difference	P	10	5	2	1.35	%	**P**
4	Flow Rate max % difference	P	10	5	2	1.35	%	**P**

SiteVisitDate	Site	Technician
12/05/2018	DUK008	Eric Hebert

Field Systems Comments

1 **Parameter:** DasComments

All measurements (temperature and flow rate) are being made above tree canopy approximately 30 meters above ground. There are no CASTNET ozone measurements at this time. The site is considered a small footprint site with logger and flow system on the walk-up tower.

2 **Parameter:** DocumentationCo

The site operator was completing the SSRF observation section on the day of filter removal rather than the installation day.

3 **Parameter:** SitingCriteriaCom

The station measurements are being mace above the tree canopy in the Duke Experimental Forest near Durham, NC.

4 **Parameter:** ShelterCleanNotes

The shelter is custom built and in very good condition.

EEMS Spot Report

Data Compiled: 3/14/2019 11:40:19 AM

SiteVisitDate	Site	Technician
11/14/2018	GRS420	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.96669	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.34372	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.28	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.59	ppb	**P**
7	Ozone % difference max	P	7	10	4	4.6	%	**P**

EEMS Spot Report

Data Compiled: 4/2/2019 10:24:53 AM

SiteVisitDate	Site	Technician
10/02/2018	HOW191	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.03	c	**P**
2	Temperature max error	P	4	0.5	6	0.07	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97614	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.04959	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.1	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.41	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.24	ppb	**P**
9	Ozone % difference max	P	7	10	4	2.6	%	**P**
10	Flow Rate average % difference	P	10	5	6	0.00	%	**P**
11	Flow Rate max % difference	P	10	5	6	0.00	%	**P**
12	DAS Voltage average error	P	7	0.003	56	0.0001	V	**P**
13	Shelter Temperature average error	P	5	2	12	0.77	c	**P**
14	Shelter Temperature max error	P	5	2	12	1.03	c	**P**

SiteVisitDate	Site	Technician
10/02/2018	HOW191	Eric Hebert

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell B Noise **CommentCode** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

2 **Parameter:** Ozone **SensorComponent:** Cell A Noise **CommentCode** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator reported that gloves are not consistently used to handle the filter pack.

2 **Parameter:** SitingCriteriaCom

The CASTNET filter pack at this location is located above a tree canopy at approximately 23.5 meters from the ground. This is an AmeriFlux site which is approximately 2.5 km to the SW of the HOW132 CASTNET site.

3 **Parameter:** ShelterCleanNotes

The custom built shelter is clean and organized.

4 **Parameter:** MetSensorComme

Other than a temperature sensor located at the CASTNET filter location the meteorological instrumentation is being operated by the University of Maine and AmeriFlux.

EEMS Spot Report

Data Compiled: 3/14/2019 11:16:39 AM

SiteVisitDate	Site	Technician
11/10/2018	LRL117	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99021	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.71289	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.83	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.63	ppb	**P**
7	Ozone % difference max	P	7	10	4	4.5	%	**P**

EEMS Spot Report

Data Compiled: 3/14/2019 11:29:54 AM

SiteVisitDate	Site	Technician
11/13/2018	MAC426	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99643	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.55514	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.0	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.54	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.63	ppb	**P**
7	Ozone % difference max	P	7	10	4	4.0	%	**P**

EEMS Spot Report

Data Compiled: 3/14/2019 10:58:30 AM

SiteVisitDate	Site	Technician
10/28/2018	OXF122	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01638	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.2987	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.2	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.17	ppb	**P**
7	Ozone % difference max	P	7	10	4	1.4	%	**P**

EEMS Spot Report

Data Compiled: 4/1/2019 7:23:57 PM

SiteVisitDate	Site	Technician
11/15/2018	PNF126	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.10	c	**P**
2	Temperature max error	P	4	0.5	6	0.18	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01013	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.33327	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99988	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.3	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-1.11	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.15	ppb	**P**
9	Ozone % difference max	P	7	10	4	3.0	%	**P**
10	Flow Rate average % difference	P	10	5	4	0.00	%	**P**
11	Flow Rate max % difference	P	10	5	4	0.00	%	**P**
12	DAS Voltage average error	P	7	0.003	70	0.0001	V	**P**
13	Shelter Temperature average error	P	5	2	15	0.05	c	**P**
14	Shelter Temperature max error	P	5	2	15	0.07	c	**P**

SiteVisitDate	Site	Technician
11/15/2018	PNF126	Eric Hebert

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Moisture Present **CommentCode** 72

The filter sample tubing has drops of moisture in low sections outside the shelter.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator was not available for the systems audit. The reported information was obtained from the site log and site documentation.

2 **Parameter:** DasComments

The sample towers are not grounded.

3 **Parameter:** SitingCriteriaCom

The site is in a mountain bowl. The wind pattern from this site would be expected to follow up and down slope patterns. The site is also located in a hay field which is cut 2 or 3 times per year.

4 **Parameter:** ShelterCleanNotes

The shelter is in fair condition.

EEMS Spot Report

Data Compiled: 3/14/2019 12:43:11 PM

SiteVisitDate	Site	Technician
12/04/2018	QAK172	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99049	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.12281	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.7	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.08	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.05	ppb	**P**
7	Ozone % difference max	P	7	10	4	1.0	%	**P**

EEMS Spot Report

Data Compiled: 3/20/2019 4:48:23 PM

SiteVisitDate	Site	Technician
10/22/2018	RED004	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	1.38	c	**Fail**
2	Temperature max error	P	4	0.5	9	2.24	c	**Fail**
3	Flow Rate average % difference	P	10	5	2	1.53	%	**P**
4	Flow Rate max % difference	P	10	5	2	1.63	%	**P**
5	DAS Voltage average error	P	7	0.003	14	0.0017	V	**P**

SiteVisitDate	Site	Technician
10/22/2018	RED004	Sandy Grenville

Field Systems Comments

1 **Parameter:** DocumentationCo

There is no site logbook and all manuals are kept electronically since the site is a small footprint site with no place to store hardcopies.

2 **Parameter:** SitingCriteriaCom

The site has been cleared approximately 8 meters around the base of the tower. Herbicide was used.

3 **Parameter:** ShelterCleanNotes

Small footprint site with enclosure for instruments only. No shelter.

EEMS Spot Report

Data Compiled: 4/1/2019 4:44:02 PM

SiteVisitDate	Site	Technician
10/27/2018	SAL133	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.06	c	**P**
2	Temperature max error	P	4	0.5	9	0.14	c	**P**
3	Ozone Slope	P	0	1.1	4	1.04441	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.41066	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.5	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.53	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.48	ppb	**P**
9	Ozone % difference max	P	7	10	4	4.1	%	**P**
10	Flow Rate average % difference	P	10	5	4	4.67	%	**P**
11	Flow Rate max % difference	P	10	5	4	5.1	%	**Fail**
12	DAS Voltage average error	P	7	0.003	63	0.0001	V	**P**
13	Shelter Temperature average error	P	5	2	15	0.65	c	**P**
14	Shelter Temperature max error	P	5	2	15	1.12	c	**P**

SiteVisitDate	Site	Technician
10/27/2018	SAL133	Sandy Grenville

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and a zero/span/precision test is performed every two weeks.

2 **Parameter:** SitingCriteriaCom

The site is located next to a field usually planted with corn or soy beans.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition and there is evidence of a leak in the shelter roof and ants are present. It is clean, neat, and well organized.

4 **Parameter:** MetOpMaintCom

The temperature signal cable is showing signs of wear.

EEMS Spot Report

Data Compiled: 3/14/2019 10:42:11 AM

SiteVisitDate	Site	Technician
10/26/2018	SAN189	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98377	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.01678	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99983	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-1.9	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.2	ppb	**P**
7	Ozone % difference max	P	7	10	4	8.5	%	**P**

EEMS Spot Report

Data Compiled: 3/14/2019 12:29:52 PM

SiteVisitDate	Site	Technician
11/19/2018	SHN418	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98746	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.55993	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.35	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.78	ppb	**P**
7	Ozone % difference max	P	7	10	4	5.6	%	**P**

EEMS Spot Report

Data Compiled: 3/14/2019 9:57:57 AM

SiteVisitDate	Site	Technician
10/25/2018	STK138	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97103	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.13936	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.4	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.07	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.24	ppb	**P**
7	Ozone % difference max	P	7	10	4	2.8	%	**P**

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell B Flow **CommentCode** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

EEMS Spot Report

Data Compiled: 3/13/2019 7:33:13 PM

SiteVisitDate	Site	Technician
10/19/2018	VIN140	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01647	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.04168	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.8	%	**P**
5	Ozone Absolute Difference g2	P	7	1.5	1	0.22	ppb	**P**
6	Ozone % difference max	P	7	10	4	2.4	%	**P**

EEMS Spot Report

Data Compiled: 3/13/2019 8:32:44 PM

SiteVisitDate	Site	Technician
10/23/2018	VOY413	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00442	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.24024	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.3	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.25	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.1	ppb	**P**
7	Ozone % difference max	P	7	10	4	0.6	%	**P**

EEMS Spot Report

Data Compiled: 3/14/2019 12:35:06 PM

SiteVisitDate	Site	Technician
12/01/2018	WSP144	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99263	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.43695	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-1.56	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.5	ppb	**P**
7	Ozone % difference max	P	7	10	4	9.8	%	**P**

EEMS Spot Report

Data Compiled: 4/2/2019 11:38:08 AM

SiteVisitDate	Site	Technician
10/08/2018	WST109	Korey Devins

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.07	c	**P**
2	Temperature max error	P	4	0.5	9	0.13	c	**P**
3	Ozone Slope	P	0	1.1	4	0.95382	unitless	**P**
4	Ozone Intercept	P	0	5	4	1.30927	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.7	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	1.09	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.70	ppb	**P**
9	Ozone % difference max	P	7	10	4	4.7	%	**P**
10	Flow Rate average % difference	P	10	5	2	0.44	%	**P**
11	Flow Rate max % difference	P	10	5	2	0.66	%	**P**
12	DAS Voltage average error	P	7	0.003	56	0.0001	V	**P**
13	Shelter Temperature average error	P	5	2	15	0.42	c	**P**
14	Shelter Temperature max error	P	5	2	15	0.64	c	**P**

SiteVisitDate	Site	Technician
10/08/2018	WST109	Korey Devins

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Moisture Present **CommentCode** 72

The filter sample tubing has drops of moisture in low sections outside the shelter.

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

Ozone sample train leak checks are being conducted every two weeks.

2 **Parameter:** SitingCriteriaCom

The site is in a small clearing surrounded by mountain forest.

3 **Parameter:** SiteOKNotes

State of NH Department of Environmental Services contact is Tom Fazzina (603) 271-0911 and tfazzina@DES.state.NH.US

4 **Parameter:** MetSensorComme

The temperature sensor is now mounted in a naturally aspirated shield on the sample tower.

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
VIN140-Sandy Grenville-10/19/2018						
1	10/19/2018	DAS	Campbell	000358	CR3000	2136
2	10/19/2018	Ozone	ThermoElectron Inc	000740	49i A1NAA	1105347311
3	10/19/2018	Ozone Standard	ThermoElectron Inc	000546	49i A3NAA	0929938239
4	10/19/2018	Zero air pump	Werther International	06906	C 70/4	000821908

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347311	VIN140	Sandy Grenville	10/19/2018	Ozone	000740

Slope:	1.01647	**Slope:**	0.00000
Intercept	0.04168	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.10	0.00	-0.11	ppb		-0.11
primary	2	16.16	16.00	16.22	ppb		0.22
primary	3	35.23	35.01	35.72	ppb	2.01	
primary	4	67.41	67.10	68.68	ppb	2.33	
primary	5	107.71	107.28	108.80	ppb	1.41	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	Not functioning	Fail
Offset	0.10	pass
Span	1.026	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	105.3 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	707.4 mmHg	pass
Cell A Tmp.	31.7 C	pass
Cell B Freq.	97.8 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	707.9 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ALH157-Sandy Grenville-10/20/2018						
1	10/20/2018	DAS	Campbell	000428	CR3000	2534
2	10/20/2018	Ozone	ThermoElectron Inc	000615	49i A1NAA	1009241787
3	10/20/2018	Ozone Standard	ThermoElectron Inc	000329	49i A3NAA	0622717853
4	10/20/2018	Zero air pump	Werther International	06910	C 70/4	000829160

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241787	ALH157	Sandy Grenville	10/20/2018	Ozone	000615

Slope:	0.98941	**Slope:**	0.00000
Intercept	0.29214	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.13	0.02	0.15	ppb		0.13
primary	2	16.34	16.18	16.13	ppb		-0.05
primary	3	36.60	36.38	36.83	ppb	1.23	
primary	4	68.22	67.91	67.34	ppb	-0.84	
primary	5	108.55	108.12	107.20	ppb	-0.85	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.20	pass
Span	1.000	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	104.1 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	717.7 mmHg	pass
Cell A Tmp.	31.7 C	pass
Cell B Freq.	98.2 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	718.3 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
VOY413-Sandy Grenville-10/23/2018						
1	10/23/2018	DAS	Environmental Sys Corp	90632	8816	2505
2	10/23/2018	Ozone	ThermoElectron Inc	90730	49C	49C-70522-366
3	10/23/2018	Ozone Standard	ThermoElectron Inc	90569	49C	49C-59260-322
4	10/23/2018	Zero air pump	Twin Tower Engineering	90719	TT70/E4	526294

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-70522-366	VOY413	Sandy Grenville	10/23/2018	Ozone	90730

Slope:	1.00442	**Slope:**	0.00000
Intercept	-0.24024	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.36	0.24	-0.01	ppb		-0.25
primary	2	15.91	15.75	15.65	ppb		-0.1
primary	3	34.92	34.70	34.56	ppb	-0.4	
primary	4	66.76	66.45	66.47	ppb	0.03	
primary	5	109.56	109.13	109.40	ppb	0.25	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.40	pass
Span	1.009	pass
Zero Voltage	Not tested	pass
Fullscale Voltage	Not tested	pass
Cell A Freq.	72.1 kHz	pass
Cell A Noise	1.2 ppb	pass
Cell A Flow	0.89 lpm	pass
Cell A Pressure	712.6 mmHg	pass
Cell A Tmp.	29.4 C	pass
Cell B Freq.	91.0 kHz	pass
Cell B Noise	1.3 ppb	pass
Cell B Flow	0.80 lpm	pass
Cell B Pressure	713.0 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
STK138-Sandy Grenville-10/25/2018						
1	10/25/2018	DAS	Campbell	000349	CR3000	2128
2	10/25/2018	Ozone	ThermoElectron Inc	000625	49i A1NAA	1009241797
3	10/25/2018	Ozone Standard	ThermoElectron Inc	000688	49i A3NAA	1030244817
4	10/25/2018	Zero air pump	Werther International	06915	C 70/4	000829162

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241797	STK138	Sandy Grenville	10/25/2018	Ozone	000625

Slope:	0.97103	**Slope:**	0.00000
Intercept	0.13936	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.21	0.09	0.16	ppb		0.07
primary	2	16.04	15.88	15.64	ppb		-0.24
primary	3	35.23	35.01	34.09	ppb	-2.66	
primary	4	67.36	67.05	65.32	ppb	-2.61	
primary	5	110.11	109.68	106.60	ppb	-2.85	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.003	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	113.5 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	689.4 mmHg	pass
Cell A Tmp.	32.4 C	pass
Cell B Freq.	100.1 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.00 lpm	Fail
Cell B Pressure	689.9 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	STK138	Sandy Grenville	10/25/2018	Cell B Flow	ThermoElectron	3361	☐	☐

This analyzer diagnostic check is outside the manufacturer's recommended value.

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SAN189-Martin Valvur-10/26/2018						
1	10/26/2018	DAS	Campbell	000360	CR3000	2138
2	10/26/2018	Ozone	ThermoElectron Inc	000729	49i A1NAA	1105347323
3	10/26/2018	Ozone Standard	ThermoElectron Inc	000367	49i A3NAA	0726124683
4	10/26/2018	Zero air pump	Werther International	06875	C 70/4	000814272

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347323	SAN189	Martin Valvur	10/26/2018	Ozone	000729

Slope:	0.98377	**Slope:**	0.00000
Intercept	-1.01678	**Intercept**	0.00000
CorrCoff	0.99983	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00470	**Intercept**	0.08880
Cert Date	6/12/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.50	0.40	-1.50	ppb		-1.9
primary	2	14.20	14.04	12.84	ppb		-1.2
primary	3	34.39	34.14	33.19	ppb	-2.82	
primary	4	65.70	65.30	64.18	ppb	-1.73	
primary	5	113.21	112.59	109.00	ppb	-3.24	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.012	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	98.3 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	692.8 mmHg	pass
Cell A Tmp.	32.5 C	pass
Cell B Freq.	89.3 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.65 lpm	pass
Cell B Pressure	692.2 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
OXF122-Sandy Grenville-10/28/2018						
1	10/28/2018	DAS	Campbell	000425	CR3000	2528
2	10/28/2018	Ozone	ThermoElectron Inc	000610	49i A1NAA	1009241778
3	10/28/2018	Ozone Standard	ThermoElectron Inc	000545	49i A3NAA	0929938241
4	10/28/2018	Zero air pump	Werther International	06911	PC70/4	000829167

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241778	OXF122	Sandy Grenville	10/28/2018	Ozone	000610

Slope:	1.01638	**Slope:**	0.00000
Intercept	-0.29870	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.23	0.11	-0.09	ppb		-0.2
primary	2	16.29	16.13	15.96	ppb		-0.17
primary	3	35.67	35.45	35.86	ppb	1.15	
primary	4	68.58	68.27	68.91	ppb	0.93	
primary	5	110.24	109.81	111.40	ppb	1.44	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.030	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	106.7 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	686.3 mmHg	pass
Cell A Tmp.	33.2 C	pass
Cell B Freq.	96.8 kHz	pass
Cell B Noise	1.3 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	686.9 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
LRL117-Eric Hebert-11/10/2018						
1	11/10/2018	DAS	Campbell	000344	CR300	2123
2	11/10/2018	Ozone	ThermoElectron Inc	000701	49i A1NAA	1030244808
3	11/10/2018	Ozone Standard	ThermoElectron Inc	000444	49i A3NAA	CM08200020
4	11/10/2018	Zero air pump	Werther International	06904	C 70/4	000821901

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244808	LRL117	Eric Hebert	11/10/2018	Ozone	000701

Slope:	0.99021	**Slope:**	0.00000
Intercept	-0.71289	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.71	0.63	-0.20	ppb		-0.83
primary	2	14.08	13.96	13.33	ppb		-0.63
primary	3	36.07	35.88	34.72	ppb	-3.29	
primary	4	70.16	69.86	68.42	ppb	-2.08	
primary	5	113.63	113.19	111.40	ppb	-1.59	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Moderately clean	pass
Battery Backup	N/A	pass
Offset	-0.10	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	115.6 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	695.8 mmHg	pass
Cell A Tmp.	32.5 C	pass
Cell B Freq.	84.8 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	696.4 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BVL130-Eric Hebert-11/11/2018						
1	11/11/2018	DAS	Campbell	000424	CR3000	2539
2	11/11/2018	Ozone	ThermoElectron Inc	000739	49i A1NAA	1105347318
3	11/11/2018	Ozone Standard	ThermoElectron Inc	000512	49i A3NAA	0922236890
4	11/11/2018	Zero air pump	Werther International	06926	PC70/4	000836218

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347318	BVL130	Eric Hebert	11/11/2018	Ozone	000739

Slope:	0.98685	**Slope:**	0.00000
Intercept	-0.87873	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.53	0.45	-0.53	ppb		-0.98
primary	2	14.36	14.24	13.41	ppb		-0.83
primary	3	35.35	35.16	33.86	ppb	-3.77	
primary	4	70.67	70.37	68.20	ppb	-3.13	
primary	5	114.23	113.79	111.60	ppb	-1.94	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Moderately clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.015	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	103.5 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	728.1 mmHg	pass
Cell A Tmp.	35.3 C	pass
Cell B Freq.	94.0 kHz	pass
Cell B Noise	0.4 ppb	pass
Cell B Flow	0.73 lpm	pass
Cell B Pressure	729.1 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MAC426-Eric Hebert-11/13/2018						
1	11/13/2018	DAS	Environmental Sys Corp	none	8832	unknown4
2	11/13/2018	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745085
3	11/13/2018	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1015543061
4	11/13/2018	Zero air pump	Werther International	none	PC70/4	606489

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030745085	MAC426	Eric Hebert	11/13/2018	Ozone	none

Slope:	0.99643	**Slope:**	0.00000
Intercept	-0.55514	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.90	0.82	0.28	ppb		-0.54
primary	2	15.94	15.81	15.18	ppb		-0.63
primary	3	37.20	37.00	36.31	ppb	-1.88	
primary	4	68.63	68.33	67.53	ppb	-1.18	
primary	5	114.80	114.36	113.40	ppb	-0.84	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.50	pass
Span	1.020	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	136.3 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.81 lpm	pass
Cell A Pressure	736.5 mmHg	pass
Cell A Tmp.	32.8 C	pass
Cell B Freq.	112.1 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.81 lpm	pass
Cell B Pressure	737.4 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DCP114-Sandy Grenville-11/14/2018						
1	11/14/2018	DAS	Campbell	000345	CR3000	2124
2	11/14/2018	Ozone	ThermoElectron Inc	000702	49i A1NAA	1030244799
3	11/14/2018	Ozone Standard	ThermoElectron Inc	000515	49i A3NAA	0922236891
4	11/14/2018	Zero air pump	Werther International	06939	PC70/4	000829175

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244799	DCP114	Sandy Grenville	11/14/2018	Ozone	000702

Slope:	1.01609	**Slope:**	0.00000
Intercept	0.37187	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.41	0.29	0.30	ppb		0.01
primary	2	14.75	14.59	15.76	ppb		1.17
primary	3	34.54	34.33	35.13	ppb	2.3	
primary	4	68.38	68.07	69.44	ppb	1.99	
primary	5	111.85	111.41	113.60	ppb	1.95	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.10	pass
Span	1.028	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	101.4 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	721.3 mmHg	pass
Cell A Tmp.	27.9 C	pass
Cell B Freq.	105.2 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	721.0 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GRS420-Eric Hebert-11/14/2018						
1	11/14/2018	DAS	Environmental Sys Corp	none	8832	A4115K
2	11/14/2018	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943903
3	11/14/2018	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450193
4	11/14/2018	Zero air pump	Werther International	none	PC70/4	531385

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1023943903	GRS420	Eric Hebert	11/14/2018	Ozone	none

Slope:	0.96669	**Slope:**	0.00000
Intercept	-0.34372	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.04	-0.03	-0.31	ppb		-0.28
primary	2	14.57	14.45	13.86	ppb		-0.59
primary	3	36.90	36.71	35.07	ppb	-4.57	
primary	4	68.59	68.29	65.12	ppb	-4.75	
primary	5	113.42	112.98	109.20	ppb	-3.4	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	0.979	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	95.9 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.65 lpm	pass
Cell A Pressure	684.6 mmHg	pass
Cell A Tmp.	31.5 C	pass
Cell B Freq.	98.6 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	685.2 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BWR139-Eric Hebert-11/16/2018						
1	11/16/2018	DAS	Campbell	000431	CR3000	2536
2	11/16/2018	Ozone	ThermoElectron Inc	000618	49i A1NAA	1009241789
3	11/16/2018	Ozone Standard	ThermoElectron Inc	000697	49i A3NAA	1030244814
4	11/16/2018	Zero air pump	Werther International	06877	C 70/4	000815258

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241789	BWR139	Eric Hebert	11/16/2018	Ozone	000618

Slope:	1.03497	**Slope:**	0.00000
Intercept	-1.85768	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.06	-0.01	-1.82	ppb		-1.81
primary	2	13.73	13.61	12.22	ppb		-1.39
primary	3	34.84	34.65	34.19	ppb	-1.34	
primary	4	68.62	68.32	68.42	ppb	0.15	
primary	5	112.86	112.42	114.70	ppb	2.01	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Moderately clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.048	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	98.9 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	726.4 mmHg	pass
Cell A Tmp.	31.3 C	pass
Cell B Freq.	100.8 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	727.3 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SHN418-Eric Hebert-11/19/2018						
1	11/19/2018	DAS	Environmental Sys Corp	90658	8816	2643
2	11/19/2018	Ozone	ThermoElectron Inc	none	49i A3NAA	0903334535
3	11/19/2018	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460009
4	11/19/2018	Zero air pump	Werther International	none	C 70/4	000855578

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0903334535	SHN418	Eric Hebert	11/19/2018	Ozone	none

Slope:	0.98746	**Slope:**	0.00000
Intercept	0.55993	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.55	-0.61	-0.26	ppb		0.35
primary	2	14.05	13.93	14.71	ppb		0.78
primary	3	33.62	33.44	33.54	ppb	0.3	
primary	4	67.54	67.25	66.71	ppb	-0.81	
primary	5	108.80	108.38	107.70	ppb	-0.63	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.10	pass
Span	0.995	pass
Zero Voltage	0.0007	pass
Fullscale Voltage	1.0005	pass
Cell A Freq.	88.8 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	658.4 mmHg	pass
Cell A Tmp.	34.2 C	pass
Cell B Freq.	99.8 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.65 lpm	pass
Cell B Pressure	657.8 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
WSP144-Eric Hebert-12/01/2018						
1	12/1/2018	DAS	Campbell	000430	CR3000	2525
2	12/1/2018	Ozone	ThermoElectron Inc	000734	49i A1NAA	1105347317
3	12/1/2018	Ozone Standard	ThermoElectron Inc	000543	49i A3NAA	0929938240
4	12/1/2018	Zero air pump	Werther International	06880	C 70/4	000814273

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347317	WSP144	Eric Hebert	12/01/2018	Ozone	000734

Slope:	0.99263	**Slope:**	0.00000
Intercept	-1.43695	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.45	0.37	-1.19	ppb		-1.56
primary	2	15.48	15.35	13.85	ppb		-1.5
primary	3	37.61	37.41	35.69	ppb	-4.71	
primary	4	68.06	67.77	66.03	ppb	-2.6	
primary	5	116.46	116.01	113.60	ppb	-2.1	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.021	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	107.6 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	733.3 mmHg	pass
Cell A Tmp.	34.7 C	pass
Cell B Freq.	96.4 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	732.7 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
QAK172-Sandy Grenville-12/04/2018						
1	12/4/2018	DAS	Campbell	000418	CR3000	2518
2	12/4/2018	Ozone	ThermoElectron Inc	000683	49i A1NAA	1030244798
3	12/4/2018	Ozone Standard	ThermoElectron Inc	000368	49i A3NAA	0726124682
4	12/4/2018	Zero air pump	Werther International	06870	PC70/4	000814278

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244798	QAK172	Sandy Grenville	12/04/2018	Ozone	000683

Slope:	0.99049	**Slope:**	0.00000
Intercept	0.12281	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.40	0.28	0.20	ppb		-0.08
primary	2	15.61	15.45	15.40	ppb		-0.05
primary	3	34.40	34.19	34.40	ppb	0.61	
primary	4	66.98	66.67	66.00	ppb	-1.01	
primary	5	111.40	110.96	110.00	ppb	-0.87	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.001	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	97.3 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	687.9 mmHg	pass
Cell A Tmp.	26.5 C	pass
Cell B Freq.	96.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.73 lpm	pass
Cell B Pressure	687.3 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CND125-Eric Hebert-12/05/2018						
1	12/5/2018	DAS	Campbell	000499	CR3000	3816
2	12/5/2018	Ozone	ThermoElectron Inc	000692	49i A1NAA	1030244803
3	12/5/2018	Ozone Standard	ThermoElectron Inc	000376	49i A3NAA	0726124693
4	12/5/2018	Zero air pump	Werther International	06868	C 70/4	000814284

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244803	CND125	Eric Hebert	12/05/2018	Ozone	000692

Slope:	0.97813	**Slope:**	0.00000
Intercept	-0.17465	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.04	-0.11	-0.60	ppb		-0.49
primary	2	14.97	14.85	14.78	ppb		-0.07
primary	3	38.66	38.46	37.23	ppb	-3.25	
primary	4	68.04	67.75	66.31	ppb	-2.15	
primary	5	113.50	113.06	110.30	ppb	-2.47	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Dirty	Fail
Battery Backup	N/A	pass
Offset	-0.20	pass
Span	1.003	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	92.7 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	714.3 mmHg	pass
Cell A Tmp.	36.1 C	pass
Cell B Freq.	100.5 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	713.7 mmHg	pass
Cell B Tmp.	N/A	pass
Line Loss	Not tested	pass
System Memo		pass