2020 – 3rd 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

EPA Contract No. EP-W-18-005

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 Specialists, Inc.
ASTM	American Society for Testing and Materials
BLM-WSO	Bureau of Land Management – Wyoming State Office
CASTNET	Clean Air Status and Trends Network
CMAQ	Community Multiscale Air Quality
DAS	data acquisition system
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
MN PCA	Minnesota Pollution Control Agency
m/s	meters per second
mv	millivolt
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NYSERDA	New York State Energy Research and Development Authority
PE	Performance Evaluation
QAPP	Quality Assurance Project Plan
SCDHEC	South Carolina Department of Health and Environmental Control
SOP	standard operating procedure
TDEP	Total Deposition
TEI	Thermo Environmental Instruments
USDA-FS	United States Department of Agriculture – Forest Service
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USNO	United States Naval Observatory
VDC	volts direct current
WDEQ	Wyoming Department of Environmental Quality
WDNR	Wisconsin Department of Natural Resources
WRR	World Radiation Reference
WSLH	Wisconsin State Laboratory of Hygiene

1.0 CASTNET Quarterly Report

1.1 Introduction

The Clean Air Status and Trends Network (CASTNET) is a national air monitoring program established in 1988 by the US EPA. Nearly all CASTNET sites measures weekly concentrations of acidic gases and particles to provide accountability for EPA's emission reduction programs. Most sites measure ground-level ozone as well as supplemental measurements such as meteorology and/or other trace gas concentrations.

Ambient concentrations 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 critical loads research.

Historically, CASTNET pollutant flux measurements have been reported as the aggregate product of weekly measured concentrations and model-estimated deposition velocities. The Multi-layer Model (MLM) was used to derive deposition velocity estimates from on-site meteorological parameters, land use types, and site characteristics. In 2011, EPA discontinued meteorological measurements at most EPA-sponsored CASTNET sites.

Currently, CASTNET pollutant flux estimates are calculated as the aggregate product of weekly measured chemical concentrations and gridded 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.

Since 2011 nearly all CASTNET ozone monitors have adhered to the requirements for State or Local Air Monitoring Stations (SLAMS) as specified by the EPA in 40 CFR Part 58. As such, the ozone data collected must meet the requirements in 40 CFR Part 58 Appendix A, which defines the quality assurance (QA) requirements for gaseous pollutant ambient air monitoring. The audits performed by EEMS under this contract fulfilled the requirement for annual performance evaluation audits of pollutant monitors in the network. The QA requirements can be found at:
https://www.epa.gov/amtic/regulations-guidance-and-monitoring-plans

Currently 87 sites at 85 distinct locations measure ground-level ozone concentrations. Annual performance evaluation (PE), ozone audit data are submitted to the Air Quality System (AQS) database.

As of September 2020, the network is comprised of 97 active rural sampling sites across the United States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Bureau of Land Management – Wyoming State Office (BLM-WSO) and several independent partners. Wood Environment and Infrastructure Solutions (Wood) is responsible for operating the EPA sponsored sites, and Air Resource Specialists, 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 reported 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.

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

Sensor	Parameter	Audit Challenge	Acceptance Criteria
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
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 and ≤ ± 0.003 ppm actual difference
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, at least annually.

Field site systems audits (FSA) 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 Third Quarter 2020

This report consists of the systems and performance, and other audit results from the CASTNET sites visited during the third quarter (July through September) of 2020. The site locations, sponsor, visit dates, and parameters audited are included in Table 2. The number of sites visited during this period were fewer than scheduled due to the impact of the COVID-19 pandemic.

Table 2. CASTNET Site Audit Visits

Site ID	Sponsor	Date	MET	FSA	O3 PE	NOy	FLOW
CRM435	NPS	7/6/2020		**1**	**1**		
NPT006	EPA	7/8/2020		**1**	**1**		**1**
HWF187	EPA	7/13/2020		**1**	**1**	**1**	**1**
CNT169	EPA	7/15/2020			**1**		
CTH110	EPA	7/20/2020		**1**	**1**		**1**
MKG113	EPA	7/21/2020		**1**	**1**		**1**
KEF112	EPA	7/22/2020		**1**	**1**		**1**
PSU106	EPA	7/27/2020		**1**	**1**		**1**
ARE128	EPA	7/28/2020		**1**	**1**		**1**
WSP144	EPA	7/30/2020			**1**		
PND165	EPA	8/8/2020			**1**	**1**	
GRT434	NPS	8/10/2020		**1**	**1**		

Site ID	Sponsor	Date	MET	FSA	O3 PE	NOy	FLOW
YEL408	NPS	8/11/2020			**1**		
GLR468	NPS	8/13/2020			**1**		
MAC426	NPS	8/19/2020			**1**	**1**	
CHE185	EPA	8/21/2020			**1**		
CAD150	EPA	8/22/2020			**1**		
CVL151	EPA	8/23/2020			**1**		
CHC432	NPS	8/24/2020			**1**		
ZIO433	NPS	8/26/2020			**1**		
CAN407	NPS	8/27/2020		**1**	**1**		**1**
DIN431	NPS	8/28/2020		**1**	**1**		**1**
DCP114	EPA	8/29/2020			**1**		
BEL116	EPA	9/21/2020	**1**	**1**	**1**		**1**
PET427	NPS	9/24/2020		**1**	**1**		**1**
WST109	EPA	9/25/2020		**1**	**1**		**1**
GRC474	NPS	9/25/2020		**1**	**1**		**1**
ASH135	EPA	9/27/2020		**1**	**1**		**1**
ABT147	EPA	9/28/2020		**1**	**1**		**1**
CHA467	NPS	9/28/2020		**1**	**1**		**1**
RED006	EPA	9/29/2020		**1**			**1**
CAVE	NPS	9/29/2020		**1**	**1**		
VOY413	NPS	9/30/2020			**1**		

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 system report where necessary. Copies of the spot reports that were sent 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.*

Results of the PE audits of the gaseous pollutant monitors other than ozone, were submitted immediately following the PE and are not included in this report. All TTP PE results of gaseous pollutant monitors are uploaded to AQS and are available there. All audit data and reports are available from the EPA CASTNET website: https://java.epa.gov/castnet/reportPage.do

2.0 NADP Quarterly Report

2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates two 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 precipitation event-based Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992, and as of July 2019 is no longer in operation. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from approximately 90 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 networks of the NADP are sponsored by several federal, state, and local agencies as well as private organizations.

The NADP Program Office (PO) operates and administers the two precipitation chemistry networks (NTN and MDN), two atmospheric concentration networks (AMNet and AMoN), and two analytical laboratories (CAL and HAL), from the Wisconsin State Lab of Hygiene (WSLH) at the University of Wisconsin in Madison. The network equipment depot (NED) is also located at the WSLH.

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 Third Quarter 2020

This report presents the NADP sites surveyed during the third quarter (July through September) of 2020. The station locations, sponsors, network. and dates of the surveys are presented in Table 3.

The number of sites visited during this period were fewer than scheduled due to the impact of the COVID-19 pandemic.

Table 3. NADP Site Survey Visits

Site ID	Sponsor	Date	NTN	MDN	AMoN
ID03	NPS	7/6/2020	**1**		**1**
ID07	EPA	7/8/2020			**1**
ID11	USGS	7/9/2020	**1**		
NY20	NYSERDA	7/13/2020			**1**
FL05	US FWS	7/14/2020	**1**	**1**	
WY95	EPA	7/15/2020			**1**
CA88	USGS	7/20/2020	**1**		
NY67	EPA	7/20/2020			**1**
CA66	NPS	7/21/2020	**1**		
PA56	EPA	7/21/2020			**1**
PA29	USDA-FS	7/22/2020	**1**		**1**
CA45	USGS	7/23/2020	**1**		
CA76	USGS	7/24/2020	**1**		
PA42	PSU	7/24/2020	**1**		
OR10	USDA-FS	7/27/2020	**1**		
PA96	EPA	7/27/2020			**1**
OR97	EPA	7/28/2020	**1**		
PA00	EPA	7/28/2020	**1**		**1**
PA13	NPS	7/28/2020	**1**	**1**	
OR18	USGS	7/29/2020	**1**		
NJ98	EPA	7/30/2020			**1**
WY06	EPA	8/8/2020			**1**

Site ID	Sponsor	Date	NTN	MDN	AMoN
WY94	NPS	8/10/2020			**1**
WY08	NPS / WY DEQ	8/11/2020	**1**	**1**	
MT05	NPS	8/13/2020		**1**	
KY10	NPS	8/19/2020	**1**	**1**	
KY22	USGS	8/21/2020	**1**		
OK99	EPA	8/21/2020			**1**
AR03	EPA	8/22/2020			**1**
MS30	USDA-FS	8/23/2020			**1**
KY35	USGS	8/24/2020	**1**		
KY03	USGS	8/25/2020	**1**		**1**
KY19	USGS	8/25/2020	**1**		
UT09	NPS	8/27/2020			**1**
OH54	EPA	8/29/2020			**1**
LA12	USGS	9/2/2020	**1**		
MS12	NOAA	9/3/2020	**1**	**1**	
MD99	MD DNR	9/22/2020			**1**
NH02	EPA	9/25/2020			**1**
ME04	EPA / Penobscot Nat	9/26/2020	**1**	**1**	
ME93	EPA	9/27/2020			**1**
MN23	USGS / MN PCA	9/27/2020	**1**	**1**	
AZ98	EPA	9/28/2020			**1**
CT15	EPA	9/28/2020			**1**
MN02	EPA	9/29/2020			**1**
MN32	NPS	9/30/2020	**1**		

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 the EPA OneDrive account where the NADP PO and the U.S. EPA POs can access them and download them as needed.

Given the volume of data generated, and the fact that data is distributed and/or is available via the internet, 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*
CRM435-Martin Valvur-07/06/2020						
1	7/6/2020	Computer	Gateway	none	Probook	5CD1520H6N
2	7/6/2020	DAS	Environmental Sys Corp	none	8816	3504
3	7/6/2020	Modem	Sierra wireless	none	Airlink	unknown
4	7/6/2020	Ozone	ThermoElectron Inc	none	49iQ-ABBN	1183030010
5	7/6/2020	Ozone Standard	ThermoElectron Inc	90605	49C	49C-62025-333
6	7/6/2020	Sample Tower	Aluma Tower	missing	B	none
7	7/6/2020	siting criteria	Siting Criteria	none	none	None
8	7/6/2020	Zero air pump	Werther International	none	C 70/4	000847661

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1183030010	CRM435	Martin Valvur	07/06/2020	Ozone	none

Slope:	0.97287	**Slope:**	0.00000
Intercept	0.04425	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.13	0.09	0.38	ppb		0.29
primary	2	14.48	14.40	13.83	ppb		-0.57
primary	3	37.67	37.53	36.49	ppb	-2.81	
primary	4	66.91	66.70	64.92	ppb	-2.7	
primary	5	118.35	118.00	114.90	ppb	-2.66	

Sensor Component	Condition	Status
Audit Pressure	617.7 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	Good	pass
Tree dewline >10m or below inlet	True	pass
Offset	1.7	pass
Span	0.988	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	90.5 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	1.31 lpm	pass
Cell A Pressure	589.7 mmHg	pass
Cell A Tmp.	28.3 C	pass
Cell B Freq.	90.4 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	N/A	Pass
Cell B Pressure	589.3 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition	50 m	Status	Fail
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition	60 m	Status	Fail
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition	10 m	Status	Fail
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The station monitor is located in the electrical room inside the visitors center.

2 **Parameter:** PollAnalyzerCom

The station does not operate a dry deposition filter system.

3 **Parameter:** MetSensorComme

The combination RH/temperature sensor could not be submerged for audit. It is mounted only two feet above the building roof.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CRM435	**Technician**	Martin Valvur	**Site Visit Date**	07/06/2020

Site Sponsor (agency)	NPS	**USGS Map**	
Operating Group	NPS	**Map Scale**	
AQS #	160230101	**Map Date**	
Meteorological Type			
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement		**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	43.462158
Site Address 1		**Audit Longitude**	-113.561718
Site Address 2		**Audit Elevation**	1803
County	Butte	**Audit Declination**	12
City, State	Arco, ID		**Present**
Zip Code	83213	**Fire Extinguisher**	☑
Time Zone	Mountain	**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 Steps**	☐

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

Shelter Clean ☐ **Notes** The station monitor is located in the electrical room inside the visitors center.

Site OK ☐ **Notes**

Driving Directions

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CRM435	Technician	Martin Valvur	Site Visit Date	07/06/2020

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?	☐	No, two feet above roof
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)	☐	No, two feet above roof
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 combination RH/temperature sensor could not be submerged for audit. It is mounted only two feet above the building roof.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	CRM435	Technician	Martin Valvur	Site Visit Date	07/06/2020

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?	☑	
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	CRM435	Technician	Martin Valvur	Site Visit Date	07/06/2020

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 8 meters
4	Describe dry dep sample tube.		N/A
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?	☐	No
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	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 station does not operate a dry deposition filter system.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CRM435 **Technician** Martin Valvur **Site Visit Date** 07/06/2020

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	CRM435	Technician	Martin Valvur	Site Visit Date	07/06/2020

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	☐	N/A	☐
Site Ops Manual	☑	Electronic copy	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	N/A
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	N/A
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	CRM435	Technician	Martin Valvur	Site Visit Date	07/06/2020

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	N/A
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	N/A
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	☑	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	☑	Every 2 weeks	☑
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?	☑	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 CRM435 **Technician** Martin Valvur **Site Visit Date** 07/06/2020

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	N/A
2	Are the Site Status Report Forms being completed and filed correctly?	☑	N/A
3	Are data downloads and backups being performed as scheduled?	☑	N/A
4	Are general observations being made and recorded? How?	☑	N/A
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	N/A
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	N/A
8	Are filters protected from contamination during handling and shipping? How?	☑	N/A
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	N/A

QC Check Performed		Frequency		Compliant
Multi-point MFC Calibrations	☑	N/A		☑
Flow System Leak Checks	☑	N/A		☑
Filter Pack Inspection	☑	N/A		☑
Flow Rate Setting Checks	☑	N/A		☑
Visual Check of Flow Rate Rotometer	☑	N/A		☑
In-line Filter Inspection/Replacement	☑	N/A		☑
Sample Line Check for Dirt/Water	☑	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-S10-rev002

Site ID CRM435 **Technician** Martin Valvur **Site Visit Date** 07/06/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Gateway	Probook	5CD1520H6N	none
DAS	Environmental Sys Corp	8816	3504	none
Modem	Sierra wireless	Airlink	unknown	none
Ozone	ThermoElectron Inc	49iQ-ABBN	1183030010	none
Ozone Standard	ThermoElectron Inc	49C	49C-62025-333	90605
Sample Tower	Aluma Tower	B	none	missing
siting criteria	Siting Criteria	none	None	none
Zero air pump	Werther International	C 70/4	000847661	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
NPT006-Martin Valvur-07/08/2020						
1	7/8/2020	Computer	Dell	07069	Inspiron 15	263MC12
2	7/8/2020	DAS	Campbell	000353	CR3000	2131
3	7/8/2020	elevation	Elevation	none	none	none
4	7/8/2020	Filter pack flow pump	Permotec	none	BL30EB	432201630446
5	7/8/2020	Flow Rate	Apex	00854	AXMC105LPMDPCV	illegible
6	7/8/2020	Infrastructure	Infrastructure	none	none	none
7	7/8/2020	Modem	Sierra wireless	06990	GX440	Unknown
8	7/8/2020	Ozone	ThermoElectron Inc	000612	49i A1NAA	1009241779
9	7/8/2020	Ozone Standard	ThermoElectron Inc	000448	49i A3NAA	CM08200024
10	7/8/2020	Sample Tower	Aluma Tower	000839	AT516D1	AT214153Z12
11	7/8/2020	Shelter Temperature	Campbell	none	107-L	none
12	7/8/2020	siting criteria	Siting Criteria	none	none	None
13	7/8/2020	Temperature	RM Young	04681	41342VC	6695
14	7/8/2020	Zero air pump	Werther International	000626	PC 70/4	000815300

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	NPT006	Martin Valvur	07/08/2020	Flow Rate	00854

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	5/6/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
1.45%	1.63%			

Cal Factor Zero	0
Cal Factor Full Scale	1
Rotometer Reading:	3

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.00	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	3.036	3.040	2.96	0.000	3.00	l/m	l/m	-1.41%
primary	test pt 2	3.038	3.040	2.96	0.000	3.00	l/m	l/m	-1.32%
primary	test pt 3	3.059	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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	4.0 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241779	NPT006	Martin Valvur	07/08/2020	Ozone	000612

Slope:	1.03208	**Slope:**	0.00000
Intercept	-0.55726	**Intercept**	0.00000
CorrCoff:	0.99990	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.09	0.05	0.25	ppb		0.2
primary	2	13.20	13.12	12.70	ppb		-0.42
primary	3	38.77	38.63	39.13	ppb	1.29	
primary	4	64.60	64.39	65.02	ppb	0.97	
primary	5	114.74	114.40	118.10	ppb	3.18	

Sensor Component	Condition	Status
Audit Pressure	683.7 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	False	Fail
Tree dewline >10m or below inlet	True	pass
Offset	0.000	pass
Span	1.081	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	113.9 kHz	pass
Cell A Noise	2.0 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	657.8 mmHg	pass
Cell A Tmp.	43.9 C	Fail
Cell B Freq.	92.6 kHz	pass
Cell B Noise	1.3 ppb	pass
Cell B Flow	0.73 lpm	pass
Cell B Pressure	657.5 mmHg	pass
Line Loss	Not tested	pass
System Memo	See comments	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	6695	NPT006	Martin Valvur	07/08/2020	Temperature	04681

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	1.00026	**Intercept**	-0.01710
Cert Date	1/29/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.25	0.30		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.07	0.09	0.000	-0.2	C	-0.3
primary	Temp Mid Range	25.25	25.26	0.000	25.0	C	-0.23
primary	Temp High Range	46.66	46.66	0.000	46.4	C	-0.22

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	NPT006	Martin Valvur	07/08/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.58	0.93		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.79	22.80	0.000	23.1	C	0.31
primary	Temp Mid Range	22.22	22.23	0.000	23.2	C	0.93
primary	Temp Mid Range	21.56	21.57	0.000	22.1	C	0.49

Sensor Component	System Memo	Condition	See comments	Status	pass

Infrastructure Data For

Site ID	NPT006	Technician	Martin Valvur	Site Visit Date	07/08/2020

Shelter Make	Shelter Model	Shelter Size
Ekto		

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	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	Not functioning	Status	Fail
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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	NPT006	Martin Valvur	07/08/2020	Cell A Tmp.	ThermoElectron	3362	☐	☐

This analyzer diagnostic check is outside the manufacturer's recommended value.

Field Systems Comments

1 **Parameter:** DasComments

The shelter air conditioner is not functioning. The shelter temperature sensor is accurate. The ozone monitor cell temperature was above acceptable limits.

2 **Parameter:** SitingCriteriaCom

Site is located in wooded mountainous area.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	NPT006	**Technician**	Martin Valvur	**Site Visit Date**	07/08/2020

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	Nez Perce Tribe	**Map Scale**	
AQS #	160499991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**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**	46.276031
Site Address 1		**Audit Longitude**	-116.020137
Site Address 2		**Audit Elevation**	965
County	Idaho	**Audit Declination**	14.0
City, State	Kamiah, ID		
Zip Code	83536		**Present**
Time Zone	Pacific	**Fire Extinguisher** ☑	In vehicle
Primary Operator		**First Aid Kit** ☑	In vehicle
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 Steps ☑	

Shelter Working Room ☑ **Make** Ekto **Model** **Shelter Size**

Shelter Clean ☑ **Notes**

Site OK ☑ **Notes**

Driving Directions From the town of Kamiah, travel east on route 12. immediately after crossing the Clearwater river, turn left onto Woodland drive. Travel approximately 7 miles on Woodland Dr and look for the road leading to the 140 foot tower.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	NPT006	Technician	Martin Valvur	Site Visit Date	07/08/2020

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	NPT006	Technician	Martin Valvur	Site Visit Date	07/08/2020

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	NPT006	Technician	Martin Valvur	Site Visit Date	07/08/2020

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 10 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 NPT006 **Technician** Martin Valvur **Site Visit Date** 07/08/2020

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?	☐	No

		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 shelter air conditioner is not functioning. The shelter temperature sensor is accurate. The ozone monitor cell temperature was above acceptable limits.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	NPT006	Technician	Martin Valvur	Site Visit Date	07/08/2020

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 schedule	☐		☐

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	NPT006	Technician	Martin Valvur	Site Visit Date	07/08/2020

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	☐	N/A	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐	N/A	☑
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

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	NPT006	Technician	Martin Valvur	Site Visit Date	07/08/2020

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, logbook
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 NPT006 **Technician** Martin Valvur **Site Visit Date** 07/08/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	263MC12	07069
DAS	Campbell	CR3000	2131	000353
elevation	Elevation	none	none	none
Filter pack flow pump	Permotec	BL30EB	432201630446	none
Flow Rate	Apex	AXMC105LPMDPC	illegible	00854
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	GX440	Unknown	06990
Ozone	ThermoElectron Inc	49i A1NAA	1009241779	000612
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200024	000448
Sample Tower	Aluma Tower	AT516D1	AT214153Z12	000839
Shelter Temperature	Campbell	107-L	none	none
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342VC	6695	04681
Zero air pump	Werther International	PC 70/4	000815300	000626

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
HWF187-Korey Devins-07/13/2020						
1	7/13/2020	Computer	Dell	07034	Inspiron 15	Unknown
2	7/13/2020	DAS	Campbell	000356	CR3000	2134
3	7/13/2020	Elevation	Elevation	None	1	None
4	7/13/2020	Filter pack flow pump	Thomas	02358	illegible	illegible
5	7/13/2020	Flow Rate	Apex	000592	AXMC105LPMDPCV	illegible
6	7/13/2020	Infrastructure	Infrastructure	none	none	none
7	7/13/2020	Modem	Digi	07158	LR54	unknown
8	7/13/2020	Ozone	ThermoElectron Inc	000731	49i A1NAA	1105347309
9	7/13/2020	Ozone Standard	ThermoElectron Inc	000450	49i A3NAA	CM08200026
10	7/13/2020	Sample Tower	Aluma Tower	000864	B	unknown
11	7/13/2020	Shelter Temperature	Campbell	none	107-L	unknown
12	7/13/2020	Siting Criteria	Siting Criteria	None	1	None
13	7/13/2020	Temperature	RM Young	03934	41342	1860
14	7/13/2020	Zero air pump	Werther International	06931	C 70/4	000836212
15	7/13/2020	Zero air pump	Teledyne	000772	701H	608

DAS Data Form

DAS Time Max Error: 3.45

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2134	HWF187	Korey Devins	07/13/2020	DAS	Primary

Das Date: 7 /13/2020 **Audit Date** 7 /13/2020
Das Time: 11:46:27 **Audit Time** 11:43:00
Das Day: 195 **Audit Day** 195

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0001

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	1/28/2020	**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	0.4995	0.4995	V	V	0.0000
7	0.7000	0.6995	0.6994	V	V	-0.0001
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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	HWF187	Korey Devins	07/13/2020	Flow Rate	000592

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00032	**Intercept**	-0.02240
Cert Date	2/17/2020	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
0.89%	1.34%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.01	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	1.473	1.490	1.53	0.000	1.51	l/m	l/m	1.34%
primary	test pt 2	1.474	1.500	1.53	0.000	1.51	l/m	l/m	0.67%
primary	test pt 3	1.476	1.500	1.53	0.000	1.51	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**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347309	HWF187	Korey Devins	07/13/2020	Ozone	000731

Slope:	0.99352	**Slope:**	0.00000
Intercept	-0.48948	**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	0.99950	**Intercept**	0.29010
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.30	0.00	-0.54	ppb		-0.54
primary	2	14.96	14.67	14.16	ppb		-0.51
primary	3	36.52	36.24	35.49	ppb	-2.09	
primary	4	66.30	66.04	65.13	ppb	-1.39	
primary	5	110.45	110.21	109.00	ppb	-1.1	

Sensor Component	Condition	Status
Audit Pressure	713.4 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Moderately clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	False	fail
Offset	-0.2	pass
Span	1.001	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.2 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	696.7 mmHg	pass
Cell A Tmp.	38.5 C	pass
Cell B Freq.	88.0 kHz	pass
Cell B Noise	1.1 ppb	pass
Cell B Flow	0.56 lpm	pass
Cell B Pressure	697.3 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	1860	HWF187	Korey Devins	07/13/2020	Temperature	03934

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00797	**Intercept**	0.12950
Cert Date	2/14/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.30	0.44		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.16	0.03	0.000	0.4	C	0.32
primary	Temp Mid Range	26.96	26.62	0.000	26.5	C	-0.14
primary	Temp High Range	45.36	44.87	0.000	44.4	C	-0.44

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	unknown	HWF187	Korey Devins	07/13/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.22	0.39		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00797	Intercept	0.12950
Cert Date	2/14/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	30.84	30.47	0.000	30.1	C	-0.39
primary	Temp Mid Range	29.41	29.05	0.000	29.3	C	0.22
primary	Temp Mid Range	28.94	28.58	0.000	28.5	C	-0.06

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	HWF187	Technician	Korey Devins	Site Visit Date	07/13/2020

Shelter Make	Shelter Model	Shelter Size
ESF	none	1630 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	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	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	HWF187	Korey Devins	07/13/2020	Moisture Present	Apex	4026	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

It was discussed with the operator that the outside filter change field on the SSRF refers to the ozone inlet filter and not the dry deposition filter pack.

2 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the sample train is leak tested every other week.

3 **Parameter:** SitingCriteriaCom

Trees are beginning to approach the limit for ozone inlet criteria. The conditions were discussed with the site operator.

4 **Parameter:** ShelterCleanNotes

The shelter is in fair condition.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	HWF187	**Technician**	Korey Devins	**Site Visit Date**	07/13/2020

Site Sponsor (agency)	EPA	**USGS Map**	Newcomb
Operating Group	SUNY/ESF	**Map Scale**	
AQS #	36-031-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, Hg	**QAPP Latitude**	43.9732
Deposition Measurement	dry, wet, Hg	**QAPP Longitude**	-74.2232
Land Use	woodland - mixed	**QAPP Elevation Meters**	502
Terrain	complex	**QAPP Declination**	14.5
Conforms to MLM	No	**QAPP Declination Date**	6/17/2004
Site Telephone	(518) 582-4800	**Audit Latitude**	43.973044
Site Address 1	Adirondack Ecological Center	**Audit Longitude**	-74.223317
Site Address 2		**Audit Elevation**	497
County	Essex	**Audit Declination**	-14
City, State	Newcomb, NY		
Zip Code	12852		
Time Zone	Eastern		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

	Present	
Fire Extinguisher	☑	Inspected in Oct 2019
First Aid Kit	☑	
Safety Glasses	☑	
Safety Hard Hat	☑	
Climbing Belt	☑	
Security Fence	☐	
Secure Shelter	☐	
Stable Entry Steps	☑	

Shelter Working Room	☑	**Make**	ESF	**Model**	none	**Shelter Size**	1630 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition.				
Site OK	☑	**Notes**					

Driving Directions From I-87 take exit 29 west to Newcomb. Continue through Newcomb (about 6 miles). Just west of town, turn right (north) at the Adirondack Ecological Center. Continue past the building on the dirt road to the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	HWF187	Technician	Korey Devins	Site Visit Date	07/13/2020

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	HWF187	Technician	Korey Devins	Site Visit Date	07/13/2020

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	HWF187	Technician	Korey Devins	Site Visit Date	07/13/2020

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?	☑	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	HWF187	Technician	Korey Devins	Site Visit Date	07/13/2020

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	HWF187	Technician	Korey Devins	Site Visit Date	07/13/2020

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	☑	May 2019	☑
HASP	☑	May 2019	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	HWF187	Technician	Korey Devins	Site Visit Date	07/13/2020

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)	☑	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:

The ozone inlet filter is replaced and the sample train is leak tested every other week.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	HWF187	Technician	Korey Devins	Site Visit Date	07/13/2020

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:

It was discussed with the operator that the outside filter change field on the SSRF refers to the ozone inlet filter and not the dry deposition filter pack.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID HWF187 **Technician** Korey Devins **Site Visit Date** 07/13/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07034
DAS	Campbell	CR3000	2134	000356
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	illegible	illegible	02358
Flow Rate	Apex	AXMC105LPMDPC	illegible	000592
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07158
Ozone	ThermoElectron Inc	49i A1NAA	1105347309	000731
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200026	000450
Sample Tower	Aluma Tower	B	unknown	000864
Shelter Temperature	Campbell	107-L	unknown	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	1860	03934
Zero air pump	Teledyne	701H	608	000772
Zero air pump	Werther International	C 70/4	000836212	06931

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CTH110-Korey Devins-07/20/2020						
1	7/20/2020	Computer	Dell	07044	Inspiron 15	Unknown
2	7/20/2020	DAS	Campbell	000415	CR3000	2510
3	7/20/2020	Elevation	Elevation	None	1	None
4	7/20/2020	Filter pack flow pump	Thomas	02664	107CA18	1092135217
5	7/20/2020	Flow Rate	Apex	000557	AXMC105LPMDPCV	unknown
6	7/20/2020	Infrastructure	Infrastructure	none	none	none
7	7/20/2020	Modem	Digi	07208	LR54	unknown
8	7/20/2020	Ozone	ThermoElectron Inc	000735	49i A1NAA	1105347308
9	7/20/2020	Ozone Standard	ThermoElectron Inc	000447	49i A3NAA	CM08200023
10	7/20/2020	Sample Tower	Aluma Tower	666363	B	AT-5107-E-4-10
11	7/20/2020	Shelter Temperature	Campbell	none	107-L	none
12	7/20/2020	Shield (10 meter)	RM Young	none	unknown	none
13	7/20/2020	Siting Criteria	Siting Criteria	None	1	None
14	7/20/2020	Temperature	RM Young	06301	41342	12540
15	7/20/2020	Zero air pump	Werther International	06864	PC70/4	000815261

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2510	CTH110	Korey Devins	07/20/2020	DAS	Primary

Das Date: 7 /20/2020
Das Time: 13:55:00
Das Day: 202

Audit Date 7 /20/2020
Audit Time 13:55:00
Audit Day 202

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	1/28/2020	**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	0.6994	V	V	-0.0001
7	0.9000	0.8994	0.8992	V	V	-0.0002
7	1.0000	0.9992	0.9990	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	unknown	CTH110	Korey Devins	07/20/2020	Flow Rate	000557

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00032	**Intercept**	-0.02240
Cert Date	2/17/2020	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
				Cal Factor Full Scale	0.89
1.96%	1.96%			**Rotometer Reading:**	1.6

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalE	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	1.505	1.530	1.68	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 2	1.504	1.530	1.68	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.513	1.530	1.68	0.000	1.50	l/m	l/m	-1.96%

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**	2.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	190 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347308	CTH110	Korey Devins	07/20/2020	Ozone	000735

Slope:	0.95439	**Slope:**	0.00000
Intercept	-0.44109	**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	0.99950	**Intercept**	0.29010
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.39	0.09	-0.33	ppb		-0.42
primary	2	14.49	14.20	13.20	ppb		-1
primary	3	35.83	35.55	33.41	ppb	-6.21	
primary	4	67.20	66.94	63.32	ppb	-5.56	
primary	5	110.94	110.70	105.30	ppb	-5	

Sensor Component	Condition	Status
Audit Pressure	715.7 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	0.2	pass
Span	1.000	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	100.3 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.58 lpm	pass
Cell A Pressure	680.3 mmHg	pass
Cell A Tmp.	36.5 C	pass
Cell B Freq.	93.4 kHz	pass
Cell B Noise	1.1 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	680.9 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12540	CTH110	Korey Devins	07/20/2020	Temperature	06301

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00797	**Intercept**	0.12950
Cert Date	2/14/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.14	0.24		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.71	0.58	0.000	0.3	C	-0.24
primary	Temp Mid Range	25.26	24.93	0.000	24.9	C	-0.03

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CTH110	Korey Devins	07/20/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.09	0.10		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00797	Intercept	0.12950
Cert Date	2/14/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	30.85	30.48	0.000	30.4	C	-0.09
primary	Temp Mid Range	30.57	30.20	0.000	30.3	C	0.08
primary	Temp Mid Range	30.68	30.31	0.000	30.4	C	0.1

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	CTH110	Technician	Korey Devins	Site Visit Date	07/20/2020

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-6)	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	Fair	Status	pass
Sensor Component	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	CTH110	Korey Devins	07/20/2020	Moisture Present	Apex	3324	☐	☐

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

Field Systems Comments

1 **Parameter:** DasComments

The meteorological tower has been removed and the temperature sensor has been moved to the east leg of the sample tower at 10 meters above the ground. The shield has been changed from aspirated to naturally aspirated.

2 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and a Z/S/P is performed every two weeks.

3 **Parameter:** SitingCriteriaCom

There is a point source north of Ithaca within 40 km of the site. The tree line is less than 50 m from the site. The siting is acceptable even with the noted exceptions. Trees and overgrowth have recently been removed from the site which has improved siting criteria.

4 **Parameter:** ShelterCleanNotes

The condition of the shelter walls are beginning to deteriorate.

5 **Parameter:** MetSensorComme

The temperature sensor is mounted on the east leg of the sample tower. The temperature sensor was found hanging loose outside of the shield.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CTH110	**Technician**	Korey Devins	**Site Visit Date**	07/20/2020

Site Sponsor (agency)	EPA	**USGS Map**	Mecklenburg
Operating Group	IES	**Map Scale**	
AQS #	36-109-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, ammonia	**QAPP Latitude**	42.4010
Deposition Measurement	dry, wet	**QAPP Longitude**	-76.6535
Land Use	woodland - mixed	**QAPP Elevation Meters**	515
Terrain	rolling	**QAPP Declination**	12.3
Conforms to MLM	No	**QAPP Declination Date**	12/28/2004
Site Telephone	(607) 564-7622	**Audit Latitude**	42.400875
Site Address 1	CR 136 (Connecticut Hill Road)	**Audit Longitude**	-76.653516
Site Address 2		**Audit Elevation**	511
County	Tompkins	**Audit Declination**	-12.0
City, State	Newfield, NY		
Zip Code	14867	**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 Steps** ☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2116-6)	**Shelter Size**	640 cuft
Shelter Clean	☐	**Notes**	The condition of the shelter walls are beginning to deteriorate.				
Site OK	☑	**Notes**					

Driving Directions

From Ithaca take route 13 south to hwy 327. Bear right onto hwy 327 and go past both the lower and upper entrances for Robert Treman St Park. Turn left at the second left past the upper entrance to the park onto Trumbell Corners Road. Continue on Trumbell Corners Rd for approximately one mile to the stop sign. Turn right at the stop onto Connecticut Hill Road and continue for approximately 1/4 mile where it veers to the right. The site is up the hill on the left just after the turn in the road.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CTH110	Technician	Korey Devins	Site Visit Date	07/20/2020

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?	☑	East
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:

The temperature sensor is mounted on the east leg of the sample tower. The temperature sensor was found hanging loose outside of the shield.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	CTH110	Technician	Korey Devins	Site Visit Date	07/20/2020

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	CTH110	Technician	Korey Devins	Site Visit Date	07/20/2020

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	CTH110	Technician	Korey Devins	Site Visit Date	07/20/2020

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 meteorological tower has been removed and the temperature sensor has been moved to the east leg of the sample tower at 10 meters above the ground. The shield has been changed from aspirated to naturally aspirated.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	CTH110	Technician	Korey Devins	Site Visit Date	07/20/2020

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 schedule	☐		☐

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	CTH110	Technician	Korey Devins	Site Visit Date	07/20/2020

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained at ESE 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)	☑	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:

The ozone inlet filter is replaced and a Z/S/P is performed every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	CTH110	Technician	Korey Devins	Site Visit Date	07/20/2020

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 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 CTH110 **Technician** Korey Devins **Site Visit Date** 07/20/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07044
DAS	Campbell	CR3000	2510	000415
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	1092135217	02664
Flow Rate	Apex	AXMC105LPMDPC	unknown	000557
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07208
Ozone	ThermoElectron Inc	49i A1NAA	1105347308	000735
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200023	000447
Sample Tower	Aluma Tower	B	AT-5107-E-4-10	666363
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	RM Young	unknown	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	12540	06301
Zero air pump	Werther International	PC70/4	000815261	06864

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MKG113-Korey Devins-07/21/2020						
1	7/21/2020	Computer	Dell	07030	Inspiron 15	Unknown
2	7/21/2020	DAS	Campbell	000404	CR3000	2521
3	7/21/2020	Elevation	Elevation	None	1	None
4	7/21/2020	Filter pack flow pump	Thomas	03639	107CAB18	049400004427
5	7/21/2020	Flow Rate	Apex	000637	AXMC105LPMDPCV	illegible
6	7/21/2020	Infrastructure	Infrastructure	none	none	none
7	7/21/2020	Modem	Digi	07161	LR54	unknown
8	7/21/2020	Ozone	ThermoElectron Inc	000723	49i A1NAA	1105347327
9	7/21/2020	Ozone Standard	ThermoElectron Inc	000370	49i A3NAA	0726124689
10	7/21/2020	Sample Tower	Aluma Tower	666362	B	AT-5107-E-4-11
11	7/21/2020	Shelter Temperature	Campbell	none	107-L	none
12	7/21/2020	Siting Criteria	Siting Criteria	None	1	None
13	7/21/2020	Temperature	RM Young	04312	41342	4009
14	7/21/2020	Zero air pump	Werther International	06897	C 70/4	000821893

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2521	MKG113	Korey Devins	07/21/2020	DAS	Primary

Das Date: 7 /21/2020
Das Time: 12:14:15
Das Day: 203

Audit Date 7 /21/2020
Audit Time 12:14:15
Audit Day 203

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	1/28/2020	**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	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2996	V	V	-0.0001
7	0.5000	0.4996	0.4995	V	V	-0.0001
7	0.7000	0.6995	0.6993	V	V	-0.0002
7	0.9000	0.8993	0.8991	V	V	-0.0002
7	1.0000	0.9992	0.9990	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	MKG113	Korey Devins	07/21/2020	Flow Rate	000637

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00032	**Intercept**	-0.02240
Cert Date	2/17/2020	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.011
				Cal Factor Full Scale	0.971
3.46%	3.87%			**Rotometer Reading:**	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	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	0.01	l/m	l/m	
primary	test pt 1	1.517	1.540	1.54	0.000	1.49	l/m	l/m	-3.25%
primary	test pt 2	1.519	1.540	1.54	0.000	1.49	l/m	l/m	-3.25%
primary	test pt 3	1.528	1.550	1.54	0.000	1.49	l/m	l/m	-3.87%

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**	3.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	40 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347327	MKG113	Korey Devins	07/21/2020	Ozone	000723

Slope:	0.99187	**Slope:**	0.00000
Intercept	-0.09786	**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	0.99950	**Intercept**	0.29010
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.26	-0.03	0.23	ppb		0.26
primary	2	15.84	15.55	15.15	ppb		-0.4
primary	3	35.83	35.55	35.02	ppb	-1.5	
primary	4	68.12	67.86	66.93	ppb	-1.38	
primary	5	111.40	111.16	110.40	ppb	-0.69	

Sensor Component	Condition	Status
Audit Pressure	730.0 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Moderately clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	-0.1	pass
Span	0.997	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	93.5 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	700.8 mmHg	pass
Cell A Tmp.	37.2 C	pass
Cell B Freq.	95.1 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	701.7 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4009	MKG113	Korey Devins	07/21/2020	Temperature	04312

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00797	**Intercept**	0.12950
Cert Date	2/14/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.07	0.10		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.29	0.16	0.000	0.2	C	0.04
primary	Temp Mid Range	25.15	24.82	0.000	24.8	C	-0.07
primary	Temp High Range	47.80	47.29	0.000	47.2	C	-0.1

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	MKG113	Korey Devins	07/21/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.55	0.71		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00797	Intercept	0.12950
Cert Date	2/14/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	29.67	29.31	0.000	28.9	C	-0.45
primary	Temp Mid Range	27.53	27.18	0.000	26.7	C	-0.49
primary	Temp Mid Range	29.15	28.79	0.000	28.1	C	-0.71

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	MKG113	Technician	Korey Devins	Site Visit Date	07/21/2020

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-4)	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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition	60 m	Status	Fail
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	MKG113	Korey Devins	07/21/2020	Moisture Present	Apex	3997	☐	☐

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

Field Systems Comments

1 **Parameter:** DasComments

The Met tower has been removed and the temperature sensor is now mounted on the sample tower in a naturally aspirated shield.

2 **Parameter:** SiteOpsProcedures

The onsite calibration line for automatic QC checks is attached downstream of the ozone inlet filter.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and organized and in good condition.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	MKG113	**Technician**	Korey Devins	**Site Visit Date**	07/21/2020

Site Sponsor (agency)	EPA	**USGS Map**	Hadley
Operating Group	PA/private	**Map Scale**	
AQS #	42-085-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	41.4250
Deposition Measurement	dry	**QAPP Longitude**	-80.1447
Land Use	woodland - mixed, agriculture	**QAPP Elevation Meters**	384
Terrain	gently rolling	**QAPP Declination**	9.25
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(724) 253-3685	**Audit Latitude**	41.426847
Site Address 1	M. K. Goddard St. Park	**Audit Longitude**	-80.145247
Site Address 2	684 Lake Wilhelm Rd.	**Audit Elevation**	377
County	Mercer	**Audit Declination**	-9.3
City, State	Sandy Lake, PA		
Zip Code	16145	**Fire Extinguisher** ☑	New in 2014
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 Steps** ☑	

Present

Shelter Working Room ☑	**Make**	Ekto	**Model**	8810 (s/n 2116-4)	**Shelter Size**	640 cuft
Shelter Clean ☑	**Notes**	The shelter is clean and organized and in good condition.				
Site OK ☑	**Notes**					

Driving Directions From I-79 take exit 130 (route 358). Go west and bear right onto Sheakleyville Road. Continue less than a mile to the stop sign, and turn right onto Lake Wilhelm Road. Continue approximately 1.5 miles, just after crossing the lake the site will be visible on the right at the state park headquarters facility.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	MKG113	Technician	Korey Devins	Site Visit Date	07/21/2020

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	MKG113	Technician	Korey Devins	Site Visit Date	07/21/2020

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	MKG113	Technician	Korey Devins	Site Visit Date	07/21/2020

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?	☐	One tree as tall as inlet within 12 meters

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 MKG113 **Technician** Korey Devins **Site Visit Date** 07/21/2020

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	MKG113	Technician	Korey Devins	Site Visit Date	07/21/2020

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	☑	March 2015	☐
HASP	☑	March 2015	☐
Field Ops Manual	☑	March 2015	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	MKG113	Technician	Korey Devins	Site Visit Date	07/21/2020

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	July 2006, refresher training by Howell and Lavery
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	☑	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?	☐	line attached after filter
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 onsite calibration line for automatic QC checks is attached downstream of the ozone inlet filter.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID MKG113 **Technician** Korey Devins **Site Visit Date** 07/21/2020

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed various times of day
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	☑	Weekly	☑
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 MKG113 **Technician** Korey Devins **Site Visit Date** 07/21/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07030
DAS	Campbell	CR3000	2521	000404
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	049400004427	03639
Flow Rate	Apex	AXMC105LPMDPC	illegible	000637
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07161
Ozone	ThermoElectron Inc	49i A1NAA	1105347327	000723
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124689	000370
Sample Tower	Aluma Tower	B	AT-5107-E-4-11	666362
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4009	04312
Zero air pump	Werther International	C 70/4	000821893	06897

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
KEF112-Korey Devins-07/22/2020						
1	7/22/2020	Computer	Dell	07054	Inspiron 15	Unknown
2	7/22/2020	DAS	Campbell	000414	CR3000	2537
3	7/22/2020	Elevation	Elevation	None	1	None
4	7/22/2020	Filter pack flow pump	Thomas	000965	107CA18	00000878
5	7/22/2020	Flow Rate	Apex	000671	AXMC105LPMDPCV	illegible
6	7/22/2020	Infrastructure	Infrastructure	none	none	none
7	7/22/2020	Modem	Digi	07192	LR54	unknown
8	7/22/2020	Ozone	ThermoElectron Inc	000700	49i A1NAA	1030244793
9	7/22/2020	Ozone Standard	ThermoElectron Inc	000432	49i A3NAA	CM08200008
10	7/22/2020	Sample Tower	Aluma Tower	03443	A	none
11	7/22/2020	Shelter Temperature	Campbell	none	107-L	none
12	7/22/2020	Siting Criteria	Siting Criteria	None	1	None
13	7/22/2020	Temperature	RM Young	06388	41342	13992
14	7/22/2020	Zero air pump	Werther International	06932	C 70/4	000829174

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2537	KEF112	Korey Devins	07/22/2020	DAS	Primary

Das Date: 7 /22/2020 **Audit Date** 7 /22/2020
Das Time: 13:01:29 **Audit Time** 13:01:30
Das Day: 204 **Audit Day** 204

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	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	1/28/2020	**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	0.4996	V	V	0.0000
7	0.7000	0.6995	0.6995	V	V	0.0000
7	0.9000	0.8993	0.8994	V	V	0.0001
7	1.0000	0.9992	0.9993	V	V	0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	KEF112	Korey Devins	07/22/2020	Flow Rate	000671

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00032	**Intercept**	-0.02240
Cert Date	2/17/2020	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.014
				Cal Factor Full Scale	0.972
3.03%	3.25%			**Rotometer Reading:**	1.6

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.01	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	1.518	1.540	1.53	0.000	1.49	l/m	l/m	-3.25%
primary	test pt 2	1.520	1.540	1.53	0.000	1.50	l/m	l/m	-2.60%
primary	test pt 3	1.519	1.540	1.53	0.000	1.49	l/m	l/m	-3.25%

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**	3.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	300 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244793	KEF112	Korey Devins	07/22/2020	Ozone	000700

Slope:	0.97185	**Slope:**	0.00000
Intercept	0.24380	**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	0.99950	**Intercept**	0.29010
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.09	-0.20	0.43	ppb		0.63
primary	2	15.60	15.31	14.84	ppb		-0.47
primary	3	34.81	34.53	33.66	ppb	-2.55	
primary	4	68.03	67.77	66.00	ppb	-2.65	
primary	5	110.14	109.90	107.20	ppb	-2.49	

Sensor Component	Condition	Status
Audit Pressure	708.6 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	False	Fail
Offset	0.2	pass
Span	0.986	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	85.5 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	672.7 mmHg	pass
Cell A Tmp.	34.1 C	pass
Cell B Freq.	83.5 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	673.3 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	13992	KEF112	Korey Devins	07/22/2020	Temperature	06388

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00797	**Intercept**	0.12950
Cert Date	2/14/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.12	0.18		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.28	0.15	0.000	0.2	C	0.04
primary	Temp Mid Range	26.08	25.75	0.000	25.6	C	-0.13
primary	Temp High Range	47.65	47.14	0.000	47.0	C	-0.18

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	KEF112	Korey Devins	07/22/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.39	0.58		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00797	Intercept	0.12950
Cert Date	2/14/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.20	25.86	0.000	25.7	C	-0.13
primary	Temp Mid Range	26.98	26.64	0.000	26.2	C	-0.46
primary	Temp Mid Range	26.85	26.51	0.000	25.9	C	-0.58

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	KEF112	Technician	Korey Devins	Site Visit Date	07/22/2020

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-14)	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	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	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	Condition	Poor	Status	Fail
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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	KEF112	Korey Devins	07/22/2020	Moisture Present	Apex	3652	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** SitingCriteriaCom

The site is in a clearing within the Kane Experimental Forest, the tree line is within 10 meters of the site.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and very well organized. The floor has been replaced but the bottom of walls are beginning to deteriorate.

4 **Parameter:** PollAnalyzerCom

Trees to the east are within 10 meters of the ozone inlet and at the same height as the inlet.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	KEF112	**Technician**	Korey Devins	**Site Visit Date**	07/22/2020

Site Sponsor (agency)	EPA	**USGS Map**	James City
Operating Group	PAFS/private	**Map Scale**	
AQS #	42-047-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	41.5981
Deposition Measurement	dry, wet	**QAPP Longitude**	-78.7683
Land Use	woodland - mixed	**QAPP Elevation Meters**	622
Terrain	rolling	**QAPP Declination**	10.5
Conforms to MLM	Yes	**QAPP Declination Date**	2/24/2006
Site Telephone	(814) 837-8069	**Audit Latitude**	41.598119
Site Address 1	Kane Experimental Forest Hdqts	**Audit Longitude**	-78.767866
Site Address 2	Seven Mile Road	**Audit Elevation**	618
County	Elk	**Audit Declination**	-10.3
City, State	Kane, PA		
Zip Code	16735	**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 Steps** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2149-14)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is clean and very well organized. The floor has been replaced but the bottom of walls are beginning to deteriorate.				
Site OK	☑	**Notes**					

Driving Directions

From Kane go south on route 66 for approximately 1 mile. Just past the 2nd cemetery turn left. Continue to the stop sign just over the railroad tracks. Turn right and continue approximately 3.2 miles through the town of Lamont. About 0.5 mile past Lamont, turn left on a gravel road which is marked with a brown Forest Service sign for the NE Forest Experimental Station. Continue approximately 2 miles and bear left at the fork. The site is behind the green Forest Service buildings on the left.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	KEF112	Technician	Korey Devins	Site Visit Date	07/22/2020

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	KEF112	Technician	Korey Devins	Site Visit Date	07/22/2020

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 KEF112 **Technician** Korey Devins **Site Visit Date** 07/22/2020

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 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:

Trees to the east are within 10 meters of the ozone inlet and at the same height as the inlet.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID KEF112 **Technician** Korey Devins **Site Visit Date** 07/22/2020

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, SampleTower not grounded

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	KEF112	Technician	Korey Devins	Site Visit Date	07/22/2020

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	☑	March 2015	☐
HASP	☑	March 2015	☐
Field Ops Manual	☑	March 2015	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	KEF112	Technician	Korey Devins	Site Visit Date	07/22/2020

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Current operator trained by previous operator, who was 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	☑	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, 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 inlet filter is replaced and a zero/span/precision check is performed every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	KEF112	Technician	Korey Devins	Site Visit Date	07/22/2020

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, 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	☑	As needed	☑
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 KEF112 **Technician** Korey Devins **Site Visit Date** 07/22/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07054
DAS	Campbell	CR3000	2537	000414
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	00000878	000965
Flow Rate	Apex	AXMC105LPMDPC	illegible	000671
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07192
Ozone	ThermoElectron Inc	49i A1NAA	1030244793	000700
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200008	000432
Sample Tower	Aluma Tower	A	none	03443
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	13992	06388
Zero air pump	Werther International	C 70/4	000829174	06932

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PSU106-Korey Devins-07/27/2020						
1	7/27/2020	Computer	Dell	07046	Inspiron 15	Unknown
2	7/27/2020	DAS	Campbell	000407	CR3000	2512
3	7/27/2020	Elevation	Elevation	None	1	None
4	7/27/2020	Filter pack flow pump	Thomas	06023	107CAB18	060400022676
5	7/27/2020	Flow Rate	Apex	000549	AXMC105LPMDPCV	illegible
6	7/27/2020	Infrastructure	Infrastructure	none	none	none
7	7/27/2020	Modem	Digi	07181	LR54	unknown
8	7/27/2020	Ozone	ThermoElectron Inc	000678	49i A1NAA	1030244791
9	7/27/2020	Ozone Standard	ThermoElectron Inc	000372	49i A3NAA	0726124684
10	7/27/2020	Sample Tower	Aluma Tower	02747	A	none
11	7/27/2020	Shelter Temperature	Campbell	none	107-L	none
12	7/27/2020	Siting Criteria	Siting Criteria	None	1	None
13	7/27/2020	Temperature	RM Young	05046	41342VC	9642
14	7/27/2020	Zero air pump	Werther International	06921	C 70/4	000836216

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2512	PSU106	Korey Devins	07/27/2020	DAS	Primary

Das Date: 7 /27/2020 **Audit Date** 7 /27/2020
Das Time: 16:16:45 **Audit Time** 16:16:45
Das Day: 209 **Audit Day** 209

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	1/28/2020	**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	0.2998	0.2997	V	V	-0.0001
7	0.5000	0.4996	0.4995	V	V	-0.0001
7	0.7000	0.6995	0.6994	V	V	-0.0001
7	0.9000	0.8993	0.8992	V	V	-0.0001
7	1.0000	0.9993	0.9991	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	PSU106	Korey Devins	07/27/2020	Flow Rate	000549

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00032	**Intercept**	-0.02240
Cert Date	2/17/2020	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.04
				Cal Factor Full Scale	0.95
3.85%	3.85%			**Rotometer Reading:**	1.6

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.02	0.000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	-0.03	l/m	l/m	
primary	test pt 1	1.537	1.560	1.55	0.000	1.50	l/m	l/m	-3.85%
primary	test pt 2	1.536	1.560	1.55	0.000	1.50	l/m	l/m	-3.85%
primary	test pt 3	1.537	1.560	1.55	0.000	1.50	l/m	l/m	-3.85%

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**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244791	PSU106	Korey Devins	07/27/2020	Ozone	000678

Slope:	0.99347	**Slope:**	0.00000
Intercept	-0.54192	**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	0.99950	**Intercept**	0.29010
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.40	0.10	-0.43	ppb		-0.53
primary	2	15.90	15.61	14.93	ppb		-0.68
primary	3	35.23	34.95	34.17	ppb	-2.26	
primary	4	67.95	67.69	66.77	ppb	-1.37	
primary	5	111.54	111.30	110.00	ppb	-1.17	

Sensor Component	Condition	Status
Audit Pressure	723.6 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	0.2	pass
Span	1.010	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	95.8 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	699.8 mmHg	pass
Cell A Tmp.	33.3 C	pass
Cell B Freq.	102.1 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	700.4 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	9642	PSU106	Korey Devins	07/27/2020	Temperature	05046

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00797	**Intercept**	0.12950
Cert Date	2/14/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.13	0.31		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.36	0.23	0.000	0.5	C	0.31
primary	Temp Mid Range	25.90	25.57	0.000	25.5	C	-0.03
primary	Temp High Range	47.24	46.74	0.000	46.7	C	-0.06

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	PSU106	Korey Devins	07/27/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.33	0.48		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00797	Intercept	0.12950
Cert Date	2/14/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.72	26.38	0.000	26.3	C	-0.06
primary	Temp Mid Range	25.28	24.95	0.000	25.4	C	0.48
primary	Temp Mid Range	24.30	23.98	0.000	24.4	C	0.44

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	PSU106	Technician	Korey Devins	Site Visit Date	07/27/2020

Shelter Make	Shelter Model	Shelter Size
PSU	N/A	3840 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	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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition	9 km	Status	Fail
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition	10 m	Status	Fail
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	PSU106	Korey Devins	07/27/2020	Moisture Present	Apex	4044	☐	☐

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

Field Systems Comments

1 **Parameter:** DasComments

The meteorological tower has been removed.

2 **Parameter:** SitingCriteriaCom

The site is within 10 km of State College which has a population of approximately 50,000. The site is located in a university agricultural research field.

3 **Parameter:** ShelterCleanNotes

The shelter is owned by the university and is clean and orderly. The site is part of the Surfrad network.

4 **Parameter:** MetOpMaintCom

The 10-meter 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	PSU106	**Technician**	Korey Devins	**Site Visit Date**	07/27/2020

Site Sponsor (agency)	EPA	**USGS Map**	Pine Grove Mills
Operating Group	PSU	**Map Scale**	
AQS #	42-027-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	40.7209
Deposition Measurement	dry	**QAPP Longitude**	-77.9316
Land Use	agriculture	**QAPP Elevation Meters**	376
Terrain	rolling - complex	**QAPP Declination**	10.9
Conforms to MLM	Marginally	**QAPP Declination Date**	9/16/2005
Site Telephone	(814) 237-5778	**Audit Latitude**	40.720902
Site Address 1	PSU Agriculture Research Farm	**Audit Longitude**	-77.931759
Site Address 2	Tadpole Road	**Audit Elevation**	364
County	Centre	**Audit Declination**	-10.7
City, State	Rockspring, PA		
Zip Code	16865	**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 Steps** ☑	

Shelter Working Room	☑	**Make**	PSU	**Model**	N/A	**Shelter Size**	3840 cuft
Shelter Clean	☑	**Notes**	The shelter is owned by the university and is clean and orderly. The site is part of the Surfrad network.				
Site OK	☑	**Notes**					

Driving Directions

From 322 on the east side of State College, take SR 3024 south. After the traffic light at the intersection of route 26, SR 3024 will change to Whitehall Road. Continue on Whitehall road for approximately 3 miles to Fairbrook. Turn left on Tadpole Road in Fairbrook at the church. Continue approximately 0.5 miles, the site will be in the field on the right.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PSU106	Technician	Korey Devins	Site Visit Date	07/27/2020

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	PSU106	Technician	Korey Devins	Site Visit Date	07/27/2020

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:

The 10-meter temperature sensor is now mounted in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	PSU106	Technician	Korey Devins	Site Visit Date	07/27/2020

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 20 meters
4	Describe dry dep sample tube.		3/8 teflon by 20 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	PSU106	Technician	Korey Devins	Site Visit Date	07/27/2020

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 meteorological tower has been removed.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	PSU106	Technician	Korey Devins	Site Visit Date	07/27/2020

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	☑	May 2019	☑
HASP	☑	May 2019	☑
Field Ops Manual	☑	May 2019	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	PSU106	Technician	Korey Devins	Site Visit Date	07/27/2020

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?	☐	No backup operator
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	☑	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?	☑	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	PSU106	Technician	Korey Devins	Site Visit Date	07/27/2020

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 PSU106 **Technician** Korey Devins **Site Visit Date** 07/27/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07046
DAS	Campbell	CR3000	2512	000407
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060400022676	06023
Flow Rate	Apex	AXMC105LPMDPC	illegible	000549
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07181
Ozone	ThermoElectron Inc	49i A1NAA	1030244791	000678
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124684	000372
Sample Tower	Aluma Tower	A	none	02747
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	9642	05046
Zero air pump	Werther International	C 70/4	000836216	06921

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ARE128-Korey Devins-07/29/2020						
1	7/29/2020	Computer	Dell	07045	Inspiron 15	Unknown
2	7/29/2020	DAS	Campbell	000400	CR3000	2524
3	7/29/2020	Elevation	Elevation	None	1	None
4	7/29/2020	Filter pack flow pump	Thomas	02661	107CA110	000012187C
5	7/29/2020	Flow Rate	Apex	000462	AXMC105LPMDPCV	42228
6	7/29/2020	Infrastructure	Infrastructure	none	none	none
7	7/29/2020	Modem	Digi	07189	LR54	unknown
8	7/29/2020	Ozone	ThermoElectron Inc	000725	49i A1NAA	1105347326
9	7/29/2020	Ozone Standard	ThermoElectron Inc	000747	49i A3NAA	1105347330
10	7/29/2020	Sample Tower	Aluma Tower	666361	B	none
11	7/29/2020	Shelter Temperature	Campbell	none	107-L	none
12	7/29/2020	Siting Criteria	Siting Criteria	None	1	None
13	7/29/2020	Temperature	RM Young	05048	41342VC	9683
14	7/29/2020	Zero air pump	Werther International	06866	PC70/4	000815262

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2524	ARE128	Korey Devins	07/29/2020	DAS	Primary

Das Date: 7 /29/2020
Das Time: 11:40:00
Das Day: 211

Audit Date 7 /29/2020
Audit Time 11:40:00
Audit Day 211

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	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	1/28/2020	**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	0.6994	V	V	-0.0001
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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	42228	ARE128	Korey Devins	07/29/2020	Flow Rate	000462

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00032	**Intercept**	-0.02240
Cert Date	2/17/2020	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.04
3.23%	3.23%			**Cal Factor Full Scale**	1.01
				Rotometer Reading:	1.6

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	-0.07	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	1.524	1.550	1.51	0.000	1.50	l/m	l/m	-3.23%
primary	test pt 2	1.526	1.550	1.51	0.000	1.50	l/m	l/m	-3.23%
primary	test pt 3	1.529	1.550	1.51	0.000	1.50	l/m	l/m	-3.23%

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**	2.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347326	ARE128	Korey Devins	07/29/2020	Ozone	000725

Slope:	0.97883	**Slope:**	0.00000
Intercept	-0.78681	**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	0.99950	**Intercept**	0.29010
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.33	0.03	-0.40	ppb		-0.43
primary	2	15.60	15.31	14.05	ppb		-1.26
primary	3	34.73	34.45	32.65	ppb	-5.37	
primary	4	67.77	67.51	65.20	ppb	-3.48	
primary	5	108.96	108.72	105.80	ppb	-2.72	

Sensor Component	Condition	Status
Audit Pressure	737.2 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	0.000	pass
Span	1.006	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.1 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	709.7 mmHg	pass
Cell A Tmp.	35.1 C	pass
Cell B Freq.	116.3 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	710.6 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	9683	ARE128	Korey Devins	07/29/2020	Temperature	05048

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00797	**Intercept**	0.12950
Cert Date	2/14/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.13	0.20		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.28	0.15	0.000	0.0	C	-0.11
primary	Temp Mid Range	27.68	27.33	0.000	27.2	C	-0.09
primary	Temp High Range	46.93	46.43	0.000	46.2	C	-0.2

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ARE128	Korey Devins	07/29/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.45	0.70		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00797	Intercept	0.12950
Cert Date	2/14/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.33	26.99	0.000	27.0	C	0.01
primary	Temp Mid Range	26.17	25.83	0.000	26.5	C	0.63
primary	Temp Mid Range	26.23	25.89	0.000	26.6	C	0.7

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ARE128	Technician	Korey Devins	Site Visit Date	07/29/2020

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-7)	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	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition	20 m	Status	Fail
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition	20 m	Status	Fail

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	ARE128	Korey Devins	07/29/2020	Moisture Present	Apex	3308	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator handles the filter caps with bare hands but handles the filter pack using the Ziploc filter bag.

2 **Parameter:** DasComments

The meteorological tower has been removed.

3 **Parameter:** SitingCriteriaCom

The site is located in an active orchard where spraying occurs. Fruit trees are rotated with corn and other crops.

4 **Parameter:** MetOpMaintCom

The 10-meter temperature sensor has been moved to a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ARE128	**Technician**	Korey Devins	**Site Visit Date**	07/29/2020

Site Sponsor (agency)	EPA	**USGS Map**	Arendtsville
Operating Group	PSU/private	**Map Scale**	
AQS #	42-001-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMROVE	**QAPP Latitude**	39.9231
Deposition Measurement	dry, wet, Hg, PM	**QAPP Longitude**	-77.3078
Land Use	agriculture	**QAPP Elevation Meters**	269
Terrain	complex - rolling	**QAPP Declination**	10.9
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(717) 677-9866	**Audit Latitude**	39.923241
Site Address 1	PSU Fruit Research Orchard	**Audit Longitude**	-77.307863
Site Address 2	Winding Road	**Audit Elevation**	266
County	Adams	**Audit Declination**	-11
City, State	Arendtsville, PA		
Zip Code	17307	**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 Steps** ☑	

Present

Shelter Working Room ☑	**Make**	Ekto	**Model**	8810 (s/n 2116-7)	**Shelter Size**	640 cuft
Shelter Clean ☑	**Notes**					
Site OK ☑	**Notes**					

Driving Directions

From Gettysburg take route 34 north to Biglerville. At the intersection of 34 and 234 turn left (west) to Arendtsville. Continue into the town of Arendtsville. At the stop sign next to the gas station, turn left and immediately turn right, onto Chambersburg Street. Continue approximately 0.4 miles and turn right onto Winding Road. There is a sign for Boyer Nursery & Orchard. The site will be visible at the top of the hill in the orchard on the right.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ARE128	Technician	Korey Devins	Site Visit Date	07/29/2020

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	ARE128	Technician	Korey Devins	Site Visit Date	07/29/2020

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:

The 10-meter temperature sensor has been moved to a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	ARE128	Technician	Korey Devins	Site Visit Date	07/29/2020

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?	☑	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	ARE128	Technician	Korey Devins	Site Visit Date	07/29/2020

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 meteorological tower has been removed.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	ARE128	Technician	Korey Devins	Site Visit Date	07/29/2020

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	☑	May 2019	☑
HASP	☑	May 2019	☑
Field Ops Manual	☑	May 2019	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	ARE128	Technician	Korey Devins	Site Visit Date	07/29/2020

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Refresher training by Lavery and Howell, July 2006
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Refresher training by Lavery and Howell, July 2006
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	☑	Weekly	☐
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?	☑	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 ARE128 **Technician** Korey Devins **Site Visit Date** 07/29/2020

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, 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?	☐	Gloves not consistently used
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 handles the filter caps with bare hands but handles the filter pack using the Ziploc filter bag.

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

Site ID ARE128 **Technician** Korey Devins **Site Visit Date** 07/29/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07045
DAS	Campbell	CR3000	2524	000400
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	000012187C	02661
Flow Rate	Apex	AXMC105LPMDPC	42228	000462
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07189
Ozone	ThermoElectron Inc	49i A1NAA	1105347326	000725
Ozone Standard	ThermoElectron Inc	49i A3NAA	1105347330	000747
Sample Tower	Aluma Tower	B	none	666361
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	9683	05048
Zero air pump	Werther International	PC70/4	000815262	06866

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GRT434-Martin Valvur-08/10/2020						
1	8/10/2020	Computer	Hewlett Packard	none	ProBook	CNU02532PM
2	8/10/2020	DAS	Environmental Sys Corp	None	8832	A3793K
3	8/10/2020	Ozone	ThermoElectron Inc	none	49i A3NAA	0703334536
4	8/10/2020	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1023943899
5	8/10/2020	Sample Tower	Aluma Tower	none	FOT-10	218298
6	8/10/2020	Shelter Temperature	ARS	none	unknown	none
7	8/10/2020	Temperature2meter	Vaisala	none	HMP45AC	Y0730041
8	8/10/2020	Zero air pump	Werther International	none	C 120/TC	001007354

DAS Data Form

DAS Time Max Error: 0.83

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A3793K	GRT434	Martin Valvur	08/10/2020	DAS	Primary

Das Date: 8 /10/2020
Das Time: 12:32:10
Das Day: 223

Audit Date 8 /10/2020
Audit Time 12:33:00
Audit Day 223

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0003	0.0001	0.0003

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	1/28/2020	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
16	0.0000	-0.0005	-0.0004	V	V	0.0001
16	0.1000	0.9996	0.9996	V	V	0.0000
16	0.3000	2.9998	3.0001	V	V	0.0003
16	0.5000	4.9996	4.9996	V	V	0.0000
16	0.7000	7.0002	7.0003	V	V	0.0001
16	0.9000	9.0001	9.0002	V	V	0.0001
16	1.0000	1.0002	1.0003	V	V	0.0001

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0703334536	GRT434	Martin Valvur	08/10/2020	Ozone	none

Slope:	1.02367	**Slope:**	0.00000
Intercept	0.11388	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.06	-0.09	0.32	ppb		0.41
primary	2	12.96	12.89	13.13	ppb		0.24
primary	3	34.16	34.03	34.93	ppb	2.61	
primary	4	64.62	64.41	65.75	ppb	2.06	
primary	5	112.17	111.84	114.80	ppb	2.61	

Sensor Component	Condition	Status
Audit Pressure	599 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	0.10	pass
Span	0.994	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	95.9 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.52 lpm	pass
Cell A Pressure	591.0 kHz	pass
Cell A Tmp.	32.7 C	pass
Cell B Freq.	73.3 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.58 lpm	pass
Cell B Pressure	590.1 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	Y0730041	GRT434	Martin Valvur	08/10/2020	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.36	0.48		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	28.88	28.89	0.0000	29.14	C	0.25
primary	Temp Mid Range	28.90	28.91	0.0000	29.39	C	0.48

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	GRT434	Martin Valvur	08/10/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.13	1.81		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.03	24.04	0.000	25.1	C	1.07
primary	Temp Mid Range	22.46	22.47	0.000	24.3	C	1.81
primary	Temp Mid Range	24.49	24.50	0.000	24.0	C	-0.51

Field Systems Comments

1 **Parameter:** PollAnalyzerCom

There is no dry deposition filter pack operating at this site.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	GRT434	**Technician**	Martin Valvur	**Site Visit Date**	08/10/2020

Site Sponsor (agency)	NPS	**USGS Map**	
Operating Group	NPS	**Map Scale**	
AQS #	56-039-0008	**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**	-110.599484
Site Address 1		**Audit Longitude**	2128
Site Address 2		**Audit Elevation**	43.670815
County	Teton	**Audit Declination**	11
City, State	Moose, WY		
Zip Code	83012		
Time Zone	Mountain		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

	Present		
Fire Extinguisher	☐		
First Aid Kit	☐		
Safety Glasses	☐		
Safety Hard Hat	☐		
Climbing Belt	☐		
Security Fence	☐		
Secure Shelter	☐		
Stable Entry Steps	☐		

Shelter Working Room	☑	**Make**		**Model**		**Shelter Size**	
Shelter Clean	☑	**Notes**					
Site OK	☑	**Notes**					
Driving Directions							

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	GRT434	Technician	Martin Valvur	Site Visit Date	08/10/2020

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	GRT434	Technician	Martin Valvur	Site Visit Date	08/10/2020

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	GRT434	Technician	Martin Valvur	Site Visit Date	08/10/2020

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 10 meters
4	Describe dry dep sample tube.		N/A
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?	☐	Not present
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	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 dry deposition filter pack operating at this site.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID GRT434 **Technician** Martin Valvur **Site Visit Date** 08/10/2020

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?	☐	not 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	GRT434	Technician	Martin Valvur	Site Visit Date	08/10/2020

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	☐	N/A	☐
Site Ops Manual	☐		☐
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	N/A
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	N/A
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	GRT434	Technician	Martin Valvur	Site Visit Date	08/10/2020

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?	☐	N/A
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	☑	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	☑	Monthly	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☐		☑
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?	☑	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	GRT434	Technician	Martin Valvur	Site Visit Date	08/10/2020

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☐	N/A
2	Are the Site Status Report Forms being completed and filed correctly?	☐	N/A
3	Are data downloads and backups being performed as scheduled?	☐	N/A
4	Are general observations being made and recorded? How?	☑	logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☐	N/A
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☐	N/A
8	Are filters protected from contamination during handling and shipping? How?	☐	N/A
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	N/A

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☐	N/A	☑
Flow System Leak Checks	☐	N/A	☑
Filter Pack Inspection	☐	N/A	☑
Flow Rate Setting Checks	☐	N/A	☑
Visual Check of Flow Rate Rotometer	☐	N/A	☑
In-line Filter Inspection/Replacement	☐	N/A	☑
Sample Line Check for Dirt/Water	☐	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-S10-rev002

Site ID GRT434 **Technician** Martin Valvur **Site Visit Date** 08/10/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	CNU02532PM	none
DAS	Environmental Sys Corp	8832	A3793K	None
Ozone	ThermoElectron Inc	49i A3NAA	0703334536	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1023943899	none
Sample Tower	Aluma Tower	FOT-10	218298	none
Shelter Temperature	ARS	unknown	none	none
Temperature2meter	Vaisala	HMP45AC	Y0730041	none
Zero air pump	Werther International	C 120/TC	001007354	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAN407-Martin Valvur-08/27/2020						
1	8/27/2020	Computer	Hewlett Packard	none	EliteBook	CNV1360668
2	8/27/2020	DAS	Environmental Sys Corp	None	8864	C2598
3	8/27/2020	Elevation	Elevation	None	1	None
4	8/27/2020	Filter pack flow pump	Thomas	none	107CA18	illegible
5	8/27/2020	flow rate	Mykrolis	03388	FC280SAV-4S	AW9403022
6	8/27/2020	Infrastructure	Infrastructure	none	none	none
7	8/27/2020	Met tower	Universal Tower	01357	unknown	none
8	8/27/2020	MFC power supply	Tylan	03678	RO-32	FP9404002
9	8/27/2020	Modem	Sierra wireless	none	GX450	LA54620441001003
10	8/27/2020	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745086
11	8/27/2020	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745084
12	8/27/2020	Sample Tower	Aluma Tower	illegible	B	none
13	8/27/2020	Shelter Temperature	ARS	none	none	none
14	8/27/2020	Siting Criteria	Siting Criteria	None	1	None
15	8/27/2020	Temperature2meter	RM Young	none	41432VC	029455
16	8/27/2020	Zero air pump	Twin Tower Engineering	90721	TT70/E4	526297

DAS Data Form

DAS Time Max Error: 0.67

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	C2598	CAN407	Martin Valvur	08/27/2020	DAS	Primary

Das Date: 8 /27/2020 **Audit Date** 8 /27/2020
Das Time: 07:57:20 **Audit Time** 07:58:00
Das Day: 240 **Audit Day** 240

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0003	0.0002	0.0003

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	1/28/2020	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
1	0.0000	-0.0001	-0.0004	V	V	-0.0003
1	0.1000	0.0997	0.0995	V	V	-0.0002
1	0.3000	0.2999	0.2997	V	V	-0.0002
1	0.5000	0.5000	0.4997	V	V	-0.0003
1	0.7000	0.6995	0.6995	V	V	0.0000
1	0.9000	0.8995	0.8992	V	V	-0.0003
1	1.0000	1.0000	0.9998	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Mykrolis	AW9403022	CAN407	Martin Valvur	08/27/2020	flow rate	03388

Mfg	Tylan
SN/Owner ID	FP9404002 03678
Parameter:	MFC power supply

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	5/6/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
0.86%	1.22%			

Cal Factor Zero	-0.026
Cal Factor Full Scale	5.32
Rotometer Reading:	3.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.02	0.0000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.0000	0.01	l/m	l/m	
primary	test pt 1	3.017	3.020	2.82	0.0000	3.00	l/m	l/m	-0.70%
primary	test pt 2	3.022	3.020	2.81	0.0000	3.00	l/m	l/m	-0.66%
primary	test pt 3	3.041	3.040	2.81	0.0000	3.00	l/m	l/m	-1.22%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	275 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030745086	CAN407	Martin Valvur	08/27/2020	Ozone	none

Slope:	0.98565	**Slope:**	0.00000
Intercept	-0.03337	**Intercept**	0.00000
CorrCoff:	0.99997	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.10	0.06	0.42	ppb		0.36
primary	2	14.10	14.02	13.70	ppb		-0.32
primary	3	36.53	36.39	35.48	ppb	-2.53	
primary	4	66.19	65.98	64.80	ppb	-1.8	
primary	5	111.31	110.98	109.60	ppb	-1.25	

Sensor Component	Condition	Status
Audit Pressure	618 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	-0.2	pass
Span	1.001	pass
Zero Voltage	0.000	pass
Fullscale Voltage	1.0003	pass
Cell A Freq.	89.1 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	597.7 mmHg	pass
Cell A Tmp.	31.4 C	pass
Cell B Freq.	93.2 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	597.1 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	029455	CAN407	Martin Valvur	08/27/2020	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.19	0.35		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.07	0.09	0.0000	0.13	C	0.04
primary	Temp Mid Range	24.24	24.25	0.0000	24.42	C	0.17
primary	Temp High Rang	47.51	47.51	0.0000	47.86	C	0.35

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CAN407	Martin Valvur	08/27/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.56	0.79		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.79	24.80	0.000	25.6	C	0.79
primary	Temp Mid Range	24.75	24.76	0.000	24.4	C	-0.33
primary	Temp Mid Range	26.56	26.57	0.000	26.0	C	-0.56

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	CAN407	Technician	Martin Valvur	Site Visit Date	08/27/2020

Shelter Make	Shelter Model	Shelter Size
NPS	R46453	640 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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Field Systems Comments

1 **Parameter:** DasComments

The shelter heating and air conditioning systems are both operating simultaneously.

2 **Parameter:** SitingCriteriaCom

The small parking lot at the visitors center is approximately 200m to the northeast.

3 **Parameter:** ShelterCleanNotes

The shelter is in good condition, well organized and well maintained.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CAN407	**Technician**	Martin Valvur	**Site Visit Date**	08/27/2020

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Musselman Arch
Operating Group	NPS	**Map Scale**	
AQS #	49-037-0101	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	woodland - mixed, desert range	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	(435) 259-4141	**Audit Latitude**	38.458323
Site Address 1	Visitors Center	**Audit Longitude**	-109.82126
Site Address 2	route 313	**Audit Elevation**	1794
County	San Juan	**Audit Declination**	11.6
City, State	Moab, UT		**Present**
Zip Code	84532	**Fire Extinguisher**	☑ Inspected April 2015
Time Zone	Mountain	**First Aid Kit**	☑ in vehicle
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 Steps**	☑

Shelter Working Room	☑	**Make**	NPS	**Model**	R46453	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, well organized and well maintained.				
Site OK	☑	**Notes**					

Driving Directions From I-70, take exit 180 south on route 191. Approximately 9 miles north of Moab, turn right (west) on route 313 at the sign for Canyonlands National Park. Follow 313 west for 25 miles passing the state park and continuing straight to Canyonlands. The site is at the end of the dirt road behind the visitors center, in the maintenance area.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CAN407	Technician	Martin Valvur	Site Visit Date	08/27/2020

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	CAN407	Technician	Martin Valvur	Site Visit Date	08/27/2020

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	CAN407	Technician	Martin Valvur	Site Visit Date	08/27/2020

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 10 meters
4	Describe dry dep sample tube.		3/8 teflon by 10 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 CAN407 **Technician** Martin Valvur **Site Visit Date** 08/27/2020

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?	☑	heat and a/c running simultaneously

		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 shelter heating and air conditioning systems are both operating simultaneously.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	CAN407	Technician	Martin Valvur	Site Visit Date	08/27/2020

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	☑	2015	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	Flow & observation sections
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	CAN407	Technician	Martin Valvur	Site Visit Date	08/27/2020

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	☑	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 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?	☑	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	CAN407	Technician	Martin Valvur	Site Visit Date	08/27/2020

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?	☑	Dataview and 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	☑	As needed	☑
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 CAN407 **Technician** Martin Valvur **Site Visit Date** 08/27/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	EliteBook	CNV1360668	none
DAS	Environmental Sys Corp	8864	C2598	None
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	illegible	none
flow rate	Mykrolis	FC280SAV-4S	AW9403022	03388
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	01357
MFC power supply	Tylan	RO-32	FP9404002	03678
Modem	Sierra wireless	GX450	LA54620441001003	none
Ozone	ThermoElectron Inc	49i A3NAA	1030745086	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1030745084	none
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41432VC	029455	none
Zero air pump	Twin Tower Engineering	TT70/E4	526297	90721

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DIN431-Martin Valvur-08/28/2020						
1	8/28/2020	Computer	Hewlett Packard	none	ProBook	5CB22906V2
2	8/28/2020	DAS	Environmental Sys Corp	None	8864	C2603
3	8/28/2020	elevation	Elevation	none	none	none
4	8/28/2020	Filter pack flow pump	Thomas	none	107CA18	0191007241
5	8/28/2020	flow rate	Mykrolis	none	FC280SAV-4S	AW902153
6	8/28/2020	Infrastructure	Infrastructure	none	none	none
7	8/28/2020	MFC power supply	Tylan	none	RO-32	FP9706002
8	8/28/2020	Modem	US Robotics	none	V.92	1MCWZ4iN2382
9	8/28/2020	Ozone	ThermoElectron Inc	none	49i A3NAA	1211052490
10	8/28/2020	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460050
11	8/28/2020	Shelter Temperature	ARS	none	unknown	none
12	8/28/2020	siting criteria	Siting Criteria	none	none	None
13	8/28/2020	Temperature2meter	RM Young	none	41342	4273
14	8/28/2020	Zero air pump	Werther International	none	PC70/4	531395

DAS Data Form

DAS Time Max Error: 0.27

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	C2603	DIN431	Martin Valvur	08/28/2020	DAS	Primary

Das Date: 8 /28/2020
Das Time: 08:31:44
Das Day: 241

Audit Date 8 /28/2020
Audit Time 08:32:00
Audit Day 241

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0003	0.0006	0.0003	0.0006

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	1/28/2020	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
3	0.0000	-0.0007	-0.0008	V	V	-0.0001
3	0.1000	0.0998	0.0993	V	V	-0.0005
3	0.3000	0.2999	0.2998	V	V	-0.0001
3	0.5000	0.4998	0.4995	V	V	-0.0003
3	0.7000	0.6997	0.6993	V	V	-0.0004
3	0.9000	0.9000	0.8994	V	V	-0.0006
3	1.0000	0.9999	0.9996	V	V	-0.0003

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Mykrolis	AW902153	DIN431	Martin Valvur	08/28/2020	flow rate	none

Mfg	Tylan	
SN/Owner ID	FP9706002	none
Parameter:	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	5/6/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
1.57%	2.58%			

Cal Factor Zero	0.042
Cal Factor Full Scale	10.81
Rotometer Reading:	3.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	-0.06	0.0000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.05	0.0000	0.02	l/m	l/m	
primary	test pt 1	3.056	3.060	0.00	0.0000	3.03	l/m	l/m	-0.92%
primary	test pt 2	3.097	3.100	0.00	0.0000	3.02	l/m	l/m	-2.58%
primary	test pt 3	3.052	3.050	0.00	0.0000	3.01	l/m	l/m	-1.21%

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**	350 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1211052490	DIN431	Martin Valvur	08/28/2020	Ozone	none

Slope:	0.98984	**Slope:**	0.00000
Intercept	-0.43922	**Intercept**	0.00000
CorrCoff:	0.99996	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.17	0.13	0.29	ppb		0.16
primary	2	16.25	16.17	15.15	ppb		-1.02
primary	3	36.75	36.61	35.48	ppb	-3.13	
primary	4	65.77	65.56	64.39	ppb	-1.8	
primary	5	113.53	113.19	111.80	ppb	-1.24	

Sensor Component	Condition	Status
Audit Pressure	643.2 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	0.1	pass
Span	0.9999	pass
Zero Voltage	0.0001	pass
Fullscale Voltage	0.9995	pass
Cell A Freq.	91.1 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	626.0 mmHg	pass
Cell A Tmp.	34.6 C	pass
Cell B Freq.	95.2 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	624.8 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4273	DIN431	Martin Valvur	08/28/2020	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.14	0.32		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.30	0.32	0.0000	0.00	C	-0.32
primary	Temp Low Rang	24.93	24.94	0.0000	24.97	C	0.03
primary	Temp Low Rang	47.25	47.25	0.0000	47.32	C	0.07

Sensor Component	Shield	Condition	Moderately clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	DIN431	Martin Valvur	08/28/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.72	0.97		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.20	25.21	0.000	24.2	C	-0.97
primary	Temp Mid Range	23.03	23.04	0.000	22.2	C	-0.83
primary	Temp Mid Range	21.36	21.37	0.000	21.7	C	0.37

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	DIN431	Technician	Martin Valvur	Site Visit Date	08/28/2020

Shelter Make	Shelter Model	Shelter Size
American Portable Buildings	A0810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type C	Status	pass
Sensor Component	Conduit	Condition	Good	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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition	40 m	Status	Fail
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Field Systems Comments

1 **Parameter:** DasComments

All sensors, filter pack, and ozone sample inlet are on a single, crank-down tower.

2 **Parameter:** SiteOpsProcedures

The site operator is not responsible for manual zero/span/precision checks, or multipoint calibrations, of the ozone analyzer.

3 **Parameter:** DocumentationCo

There are no hardcopies of manuals and operating procedures on-site. All documentation is available via the internet. Status of updates to documentation is evaluated during TSA by EPA.

4 **Parameter:** SitingCriteriaCom

A small parking lot for park service employees is located approximately 40 meters north of the site.

5 **Parameter:** ShelterCleanNotes

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

6 **Parameter:** MetSensorComme

The ambient temperature sensor is mounted approximately 8 meters from the ground and above the shelter roof.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	DIN431	**Technician**	Martin Valvur	**Site Visit Date**	08/28/2020

Site Sponsor (agency)	NPS	**USGS Map**	Dinosaur Quarry
Operating Group	NPS	**Map Scale**	
AQS #	49-047-1002	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	40.4373
Deposition Measurement	dry	**QAPP Longitude**	-109.3046
Land Use	Desert	**QAPP Elevation Meters**	1463
Terrain	complex	**QAPP Declination**	10.7
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	40.4373
Site Address 1		**Audit Longitude**	-109.3046
Site Address 2		**Audit Elevation**	1463
County	Uintah	**Audit Declination**	10.7
City, State	Jensen, UT		**Present**
Zip Code	84035	**Fire Extinguisher** ☐	Not present
Time Zone	Mountain	**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 Steps** ☑	

Shelter Working Room	☑	**Make**	American Portable Bu	**Model**	A0810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, clean, and well organized.				
Site OK	☑	**Notes**					

Driving Directions Go east on route 40 from Vernal, UT. Turn north on route 149 and follow signs for Dinosaur National Monument.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	DIN431	Technician	Martin Valvur	Site Visit Date	08/28/2020

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?	☐	Mounted on south of tower, over shelter
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:

The ambient temperature sensor is mounted approximately 8 meters from the ground and above the shelter roof.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	DIN431	Technician	Martin Valvur	Site Visit Date	08/28/2020

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?	☑	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	DIN431	Technician	Martin Valvur	Site Visit Date	08/28/2020

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?	☐	No
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 DIN431 **Technician** Martin Valvur **Site Visit Date** 08/28/2020

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?	One tower 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:

All sensors, filter pack, and ozone sample inlet are on a single, crank-down tower.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	DIN431	Technician	Martin Valvur	Site Visit Date	08/28/2020

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	☐	Not present	☐
SSRF	☑		☑
Site Ops Manual	☐	Not present	☐
HASP	☐	Not present	☐
Field Ops Manual	☐	Not present	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	Flow & observation sections
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:

There are no hardcopies of manuals and operating procedures on-site. All documentation is available via the internet. Status of updates to documentation is evaluated during TSA by EPA.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	DIN431	Technician	Martin Valvur	Site Visit Date	08/28/2020

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	☑	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	☐	Not performed	☐
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐	Not performed	☐
Analyzer Diagnostics Tests	☐	Not performed	☐
In-line Filter Replacement (at inlet)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☐	Not performed	☐
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:

The site operator is not responsible for manual zero/span/precision checks, or multipoint calibrations, of the ozone analyzer.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	DIN431	Technician	Martin Valvur	Site Visit Date	08/28/2020

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	☐	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:

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID DIN431 **Technician** Martin Valvur **Site Visit Date** 08/28/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	5CB22906V2	none
DAS	Environmental Sys Corp	8864	C2603	None
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CA18	0191007241	none
flow rate	Mykrolis	FC280SAV-4S	AW902153	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9706002	none
Modem	US Robotics	V.92	1MCWZ4iN2382	none
Ozone	ThermoElectron Inc	49i A3NAA	1211052490	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	CM08460050	none
Shelter Temperature	ARS	unknown	none	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	RM Young	41342	4273	none
Zero air pump	Werther International	PC70/4	531395	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BEL116-Eric Hebert-09/22/2020						
1	9/22/2020	Computer	Dell	07005	Inspiron 15	Unknown
2	9/22/2020	DAS	Campbell	000341	CR3000	2120
3	9/22/2020	Elevation	Elevation	None	1	None
4	9/22/2020	Filter pack flow pump	Thomas	02755	107CAB18	1192001881
5	9/22/2020	Flow Rate	Apex	000548	AXMC105LPMDPCV	50742
6	9/22/2020	Infrastructure	Infrastructure	none	none	none
7	9/22/2020	Met tower	Universal Tower	06484	unknown	none
8	9/22/2020	Modem	Raven	06475	H4222-C	0808311155
9	9/22/2020	Ozone	ThermoElectron Inc	000684	49i A1NAA	1030244795
10	9/22/2020	Ozone Standard	ThermoElectron Inc	000373	49i A3NAA	0726124685
11	9/22/2020	Precipitation	Texas Electronics	06332	TR-525i-HT	43527-807
12	9/22/2020	Relative Humidity	Vaisala	07116	HMP60	NO850846
13	9/22/2020	Sample Tower	Aluma Tower	000127	B	none
14	9/22/2020	Shelter Temperature	Campbell	none	107-L	44281
15	9/22/2020	Shield (10 meter)	RM Young	05042	Aspirated 43408	none
16	9/22/2020	Shield (2 meter)	RM Young	05041	Aspirated 43408	none
17	9/22/2020	Siting Criteria	Siting Criteria	None	1	None
18	9/22/2020	Solar Radiation	Licor	06959	LI-200	illegible
19	9/22/2020	Solar Radiation Translator	RM Young	03412	70101-X	none
20	9/22/2020	Surface Wetness	RM Young	04608	58101	none
21	9/22/2020	Temperature	RM Young	06985	41342VO	024086
22	9/22/2020	Temperature2meter	RM Young	02989	41342VO	Illegable
23	9/22/2020	Wind Direction	RM Young	04405	AQ05305	35870wdr
24	9/22/2020	Wind Speed	RM Young	04405	AQ05305	35870wsp
25	9/22/2020	Zero air pump	Werther International	06913	C 70/4	000829178

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2120	BEL116	Eric Hebert	09/22/2020	DAS	Primary

Das Date: 9 /22/2020 **Audit Date** 9 /22/2020
Das Time: 09:34:01 **Audit Time** 09:34:00
Das Day: 266 **Audit Day** 266

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	2/4/2020	**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	0.7001	0.7000	V	V	-0.0001
7	0.9000	0.9001	0.9000	V	V	-0.0001
7	1.0000	1.0001	1.0000	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	50742	BEL116	Eric Hebert	09/22/2020	Flow Rate	000548

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00032	**Intercept**	-0.02240
Cert Date	2/17/2020	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.03
1.96%	1.96%			**Cal Factor Full Scale**	0.95
				Rotometer Reading:	1.55

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.04	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.13	0.000	0.10	l/m	l/m	
primary	test pt 1	1.509	1.530	1.57	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 2	1.509	1.530	1.57	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.513	1.530	1.57	0.000	1.50	l/m	l/m	-1.96%

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**	5.5 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

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244795	BEL116	Eric Hebert	09/22/2020	Ozone	000684

Slope:	0.98550	**Slope:**	0.00000
Intercept	0.77873	**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	0.99490	**Intercept**	0.32220
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.09	-0.23	0.73	ppb		0.96
primary	2	15.66	15.21	15.53	ppb		0.32
primary	3	34.97	34.37	34.69	ppb	0.93	
primary	4	67.48	66.62	66.43	ppb	-0.29	
primary	5	108.85	107.66	106.90	ppb	-0.71	

Sensor Component	Condition	Status
Audit Pressure	729.4 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Moderately clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	-0.6	pass
Span	1.017	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	101.6 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.61 lpm	pass
Cell A Pressure	717.9 mmHg	pass
Cell A Tmp.	34.2 C	pass
Cell B Freq.	93.5 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.55 lpm	pass
Cell B Pressure	718.8 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

Wind Speed Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	35870wsp	BEL116	Eric Hebert	09/22/2020	Wind Speed	04405

Prop or Cups SN	65736
Prop or Cups Torque	0.4 **to** 0.4
Prop Correction Facto	0.0512

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	6/18/2020	**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	6/18/2020	**CorrCoff**	1.00000

	DAS 1:		**DAS 2:**	
	Low Range	**High Range:**	**Low Range**	**High Range:**
Abs Avg Err	0.05	0.00%		
Abs Max Err	0.20	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		-0.20	
primary	01253	200	1.02	0.0	1.0		0.00	
primary	01253	400	2.05	0.0	2.1		0.00	
primary	01253	800	4.10	0.0	4.1		0.00	
primary	01253	1200	6.14	0.0	6.1	0.00%		
primary	01253	2400	12.29	0.0	12.3	0.00%		
primary	01253	4000	20.48	0.0	20.5	0.00%		
primary	01253	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	50m from tree dripline	**Condition**	True	**Status**	pass
Sensor Component	obstacles >10x height above sens	**Condition**	True	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Direction Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	35870wdr	BEL116	Eric Hebert	09/22/2020	Wind Direction	04405

Mfg	RM Young	**Parameter**	wind direction
Serial Number		**Tfer Desc.**	wind direction wheel
Tfer ID	01266		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/1/2006	**CorrCoff**	1.00000

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	192034	**Tfer Desc.**	transit
Tfer ID	01270		
Slope	1.00000	**Intercept**	0.00000
Cert Date	3/2/2020	**CorrCoff**	1.00000

Vane SN: N/A **C. A. Align. deg. true:**

VaneTorque 12 **to** 12 1

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	0.8	0.8		
Abs Max Err	2	2		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01266	0	☑	0.000	1	1	44	##########
primary	01266	45	☑	0.000	45	0	43.3	-1.7
primary	01266	90	☑	0.000	90	0	45.6	##########
primary	01266	135	☑	0.000	135	0	44.6	##########
primary	01266	180	☑	0.000	180	0	45.1	##########
primary	01266	225	☑	0.000	225	0	45.1	##########
primary	01266	270	☑	0.000	272	2	47.3	##########
primary	01266	315	☑	0.000	317	2	45	0
primary	01270	90	☐	0.000	90	0		0
primary	01270	180	☐	0.000	180	0		0
primary	01270	270	☐	0.000	272	2		2
primary	01270	360	☐	0.000	1	1		1

Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	50m from tree dripline	**Condition**	True	**Status**	pass
Sensor Component	obstacles >10x height above sens	**Condition**	True	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	024086	BEL116	Eric Hebert	09/22/2020	Temperature	06985

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00797	**Intercept**	0.12950
Cert Date	2/14/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.21	0.49		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.00	-0.13	0.000	0.36	C	0.49
primary	Temp High Range	35.50	35.09	0.000	35.02	C	-0.07
primary	Temp High Range	50.00	49.48	0.000	49.55	C	0.07

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	Functioning	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	Illegable	BEL116	Eric Hebert	09/22/2020	Temperature2meter	02989

Mfg	Extech	Parameter	Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00797	Intercept	0.12950
Cert Date	2/14/2020	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.22	0.43		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	-0.04	-0.17	0.000	0.26	C	0.43
primary	Temp High Rang	35.50	35.09	0.000	35.18	C	0.09
primary	Temp High Rang	50.00	49.48	0.000	49.61	C	0.13

Sensor Component	Shield	Condition	Moderately clean	Status	pass
Sensor Component	Properly Sited	Condition	See comments	Status	Fail
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	44281	BEL116	Eric Hebert	09/22/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.18	1.72		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00797	Intercept	0.12950
Cert Date	2/14/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.76	25.43	0.000	26.1	C	0.7
primary	Temp Mid Range	23.00	22.69	0.000	24.4	C	1.72
primary	Temp Mid Range	24.25	23.93	0.000	25.1	C	1.12

Sensor Component	System Memo	Condition		Status	pass

Humidity Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	NO850846	BEL116	Eric Hebert	09/22/2020	Relative Humidity	07116

Mfg	AZ Instruments	**Parameter**	Relative Humidity
Serial Number	10325187	**Tfer Desc.**	Psychrometer
Tfer ID	01222		
Slope	1.01730	**Intercept**	-2.24690
Cert Date	1/29/2020	**CorrCoff**	0.99990

	DAS 1:		DAS 2:	
	Low Range:	**High Range:**	**Low Range:**	**High Range:**
Abs Avg Err	1.9	1.1		
Abs Max Err	1.9	1.1		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	Psychrometer		23.7	23.7	0.000	25.6	1.9
primary	RH Low Range	Psychrometer		47.6	47.6	0.000	49.4	1.8
primary	RH High Range	Psychrometer		98.9	98.9	0.000	100.0	1.1

Sensor Component	RH Filter	**Condition**	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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	illegible	BEL116	Eric Hebert	09/22/2020	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 translato	
Tfer ID	01246			
Slope	1.00000	**Intercept**	0.00000	
Cert Date	2/4/2020	**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	2/4/2020	**CorrCoff**	1.00000	

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg:**	**%Diff of Max**
2.5%	1.1%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	9/22/2020	11:00	738	738	753	2.1%
primary	9/22/2020	12:00	806	806	815	1.1%
primary	9/22/2020	14:00	726	726	718	-1.2%
primary	9/22/2020	15:00	607	606	661	9.0%

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

Surface Wetness Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	BEL116	Eric Hebert	09/22/2020	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	OutputSignalEngUnit	TferUnits	OutputSignalUnit
primary	wet	N/A	0.000	1.02	V	N/A	V
primary	dry	N/A	0.000	0.00	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**	west	**Status**	Fail
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

Infrastructure Data For

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	09/22/2020

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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	Condition	Good	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition	25 km	Status	Fail
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Temperature2meter	BEL116	Eric Hebert	09/22/2020	Properly Sited	RM Young	4577	☐	☐

The site is over-grown with underbrush making it difficult to check site equipment. The underbrush is beginning to encroach on the lower instrumentation.

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 encroaching on the lower temperature sensor and tipping bucket rain gauge.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	BEL116	**Technician**	Eric Hebert	**Site Visit Date**	09/22/2020

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**	39.0281786
Site Address 1	BARC old airport	**Audit Longitude**	-76.817129
Site Address 2	Springfield Road	**Audit Elevation**	47
County	Prince George's	**Audit Declination**	-10
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 Steps** ☑	

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-S3-rev002

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	09/22/2020

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 encroaching on the lower temperature sensor and tipping bucket rain gauge.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	09/22/2020

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:

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	BEL116	Technician	Eric Hebert	Site Visit Date	09/22/2020

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** 09/22/2020

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	09/22/2020

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 schedule	☐		☐

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	09/22/2020

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	09/22/2020

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** 09/22/2020

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	50742	000548
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	HMP60	NO850846	07116
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	024086	06985
Temperature2meter	RM Young	41342VO	Illegable	02989
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*
PET427-Martin Valvur-09/24/2020						
1	9/24/2020	Computer	Hewlett Packard	none	6560 b	5CB22906TB
2	9/24/2020	DAS	Environmental Sys Corp	90641	8816	2526
3	9/24/2020	Elevation	Elevation	None	1	None
4	9/24/2020	Filter pack flow pump	Thomas	none	107CAB18B	071100039615
5	9/24/2020	flow rate	Tylan	03379	FC280AV	AW9403023
6	9/24/2020	Infrastructure	Infrastructure	none	none	none
7	9/24/2020	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460048
8	9/24/2020	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1211052489
9	9/24/2020	Sample Tower	Aluma Tower	none	B	none
10	9/24/2020	Shelter Temperature	ARS	none	none	none
11	9/24/2020	Siting Criteria	Siting Criteria	None	1	None
12	9/24/2020	Temperature2meter	RM Young	none	41342	029201
13	9/24/2020	Zero air pump	Werther International	none	PC 70/4	531382

DAS Data Form

DAS Time Max Error: 0.22

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2526	PET427	Martin Valvur	09/24/2020	DAS	Primary

Das Date: 9 /24/2020 **Audit Date** 9 /24/2020
Das Time: 09:39:13 **Audit Time** 09:39:00
Das Day: 268 **Audit Day** 268

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0003	0.0006	0.0003	0.0006

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	1/28/2020	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
11	0.0000	-0.0489	-0.0489	V	V	0.0000
11	0.1000	0.0998	0.0999	V	V	0.0001
11	0.3000	0.2998	0.3000	V	V	0.0002
11	0.5000	0.4998	0.5000	V	V	0.0002
11	0.7000	0.6999	0.7002	V	V	0.0003
11	0.9000	0.8992	0.8996	V	V	0.0004
11	1.0000	0.9996	1.0002	V	V	0.0006

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403023	PET427	Martin Valvur	09/24/2020	flow rate	03379

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	5/6/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.205
6.19%	6.19%			**Cal Factor Full Scale**	6.008
				Rotometer Reading:	4

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalE	PctDifference
primary	pump off	0.000	0.000	-0.39	0.0000	-0.17	l/m	l/m	
primary	leak check	0.000	0.000	-0.39	0.0000	-0.17	l/m	l/m	
primary	test pt 1	3.199	3.200	2.66	0.0000	3.00	l/m	l/m	-6.19%
primary	test pt 2	3.205	3.200	2.66	0.0000	3.00	l/m	l/m	-6.19%
primary	test pt 3	3.198	3.200	2.66	0.0000	3.00	l/m	l/m	-6.19%

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**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460048	PET427	Martin Valvur	09/24/2020	Ozone	none

Slope:	0.98244	**Slope:**	0.00000
Intercept	-0.04845	**Intercept**	0.00000
CorrCoff:	0.99997	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.31	0.27	0.62	ppb		0.35
primary	2	15.84	15.76	15.04	ppb		-0.72
primary	3	36.36	36.22	35.56	ppb	-1.84	
primary	4	66.72	66.51	65.09	ppb	-2.16	
primary	5	110.34	110.01	108.20	ppb	-1.66	

Sensor Component	Audit Pressure	**Condition**	627.9 mmHg	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Minimum distance from road met	**Condition**	True	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	26.6 degree unobstructed rule	**Condition**	True	**Status**	pass
Sensor Component	Tree dewline >10m or below inlet	**Condition**	True	**Status**	pass
Sensor Component	Offset	**Condition**	0.1	**Status**	pass
Sensor Component	Span	**Condition**	1.004	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0001	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	0.9995	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	92.7 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.63 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	606.2 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	37.9 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	92.3 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.64 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	605.9 mmHg	**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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	029201	PET427	Martin Valvur	09/24/2020	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.98	1.16		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.14	0.16	0.0000	0.94	C	0.78
primary	Temp Mid Range	24.75	24.76	0.0000	25.75	C	0.99
primary	Temp High Rang	46.73	46.73	0.0000	47.89	C	1.16

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	PET427	Technician	Martin Valvur	Site Visit Date	09/24/2020

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	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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

completing the site observation section of the SSRF was discussed with the operator. Clean gloves are now used to remove and install the dry deposition filter pack.

2 **Parameter:** ShelterCleanNotes

The shelter is in good condition, well organized and maintained.

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	PET427	Martin Valvur	09/24/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.95	2.42		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.12	26.13	0.000	27.8	C	1.64
primary	Temp Mid Range	26.11	26.12	0.000	27.9	C	1.78
primary	Temp Mid Range	24.81	24.82	0.000	27.2	C	2.42

Sensor Component	System Memo	Condition		Status	pass

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PET427	**Technician**	Martin Valvur	**Site Visit Date**	09/24/2020

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Padilla Tank
Operating Group	NPS	**Map Scale**	
AQS #	04-017-0119	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, neph	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	desert	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone	(928) 524-6668	**Audit Latitude**	34.822508
Site Address 1		**Audit Longitude**	-109.892485
Site Address 2		**Audit Elevation**	1712
County	Navajo	**Audit Declination**	10.5
City, State	Petrified Forest, AZ		**Present**
Zip Code	85942	**Fire Extinguisher**	☑ Inspected March 2018
Time Zone	Mountain	**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 Steps**	☑

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

Driving Directions

From I-40 take exit 311 to the Petrified Forest . The site operator's office is located in the visitors center. The site is another 25 miles further south on the park road near the Rainbow Forest at the south end of the park, 1.5 miles west of the main road on a closed side road. The gate at the side road is locked. The key for the gate and shelter is kept at the south entrance to the park.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PET427	Technician	Martin Valvur	Site Visit Date	09/24/2020

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	PET427	Technician	Martin Valvur	Site Visit Date	09/24/2020

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?	☑	
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 PET427 **Technician** Martin Valvur **Site Visit Date** 09/24/2020

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 8 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 PET427 **Technician** Martin Valvur **Site Visit Date** 09/24/2020

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	PET427	Technician	Martin Valvur	Site Visit Date	09/24/2020

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	☑	Oct 2015	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑	Not current	☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	Flow & observation sections
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	PET427	Technician	Martin Valvur	Site Visit Date	09/24/2020

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	☑	Every 4 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Every 4 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
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	PET427	Technician	Martin Valvur	Site Visit Date	09/24/2020

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?	☑	No observations
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	Dataview
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	☑	Unknown	☑
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:

completing the site observation section of the SSRF was discussed with the operator. Clean gloves are now used to remove and install the dry deposition filter pack.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 09/24/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906TB	none
DAS	Environmental Sys Corp	8816	2526	90641
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	071100039615	none
flow rate	Tylan	FC280AV	AW9403023	03379
Infrastructure	Infrastructure	none	none	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460048	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1211052489	none
Sample Tower	Aluma Tower	B	none	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	029201	none
Zero air pump	Werther International	PC 70/4	531382	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
WST109-Korey Devins-09/25/2020						
1	9/25/2020	Computer	Dell	07027	Inspiron 15	FX2MC12
2	9/25/2020	DAS	Campbell	000354	CR3000	2132
3	9/25/2020	Elevation	Elevation	None	1	None
4	9/25/2020	Filter pack flow pump	Thomas	04925	107CA18	100300020944
5	9/25/2020	Flow Rate	Apex	000859	AXMC105LPMDPCV	illegible
6	9/25/2020	Infrastructure	Infrastructure	none	none	none
7	9/25/2020	Modem	Digi	07159	LR54	Illegible
8	9/25/2020	Ozone	ThermoElectron Inc	000611	49i A1NAA	1009241795
9	9/25/2020	Ozone Standard	ThermoElectron Inc	000443	49i A3NAA	CM08200019
10	9/25/2020	Sample Tower	Aluma Tower	000825	B	unknown
11	9/25/2020	Shelter Temperature	Campbell	none	107-L	none
12	9/25/2020	Siting Criteria	Siting Criteria	None	1	None
13	9/25/2020	Temperature	RM Young	04313	41342	4010
14	9/25/2020	Zero air pump	Werther International	06934	P 70/4	000821881

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2132	WST109	Korey Devins	09/25/2020	DAS	Primary

Das Date: 9 /25/2020
Das Time: 10:13:40
Das Day: 269

Audit Date 9 /25/2020
Audit Time 10:13:40
Audit Day 269

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0003	0.0002	0.0003

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	1/28/2020	**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	0.2998	V	V	0.0002
7	0.5000	0.4995	0.4997	V	V	0.0002
7	0.7000	0.6995	0.6996	V	V	0.0001
7	0.9000	0.8993	0.8995	V	V	0.0002
7	1.0000	0.9991	0.9994	V	V	0.0003

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	WST109	Korey Devins	09/25/2020	Flow Rate	000859

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00032	**Intercept**	-0.02240
Cert Date	2/17/2020	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.03
0.67%	0.67%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.02	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	1.470	1.490	1.51	0.000	1.50	l/m	l/m	0.67%
primary	test pt 2	1.469	1.490	1.51	0.000	1.50	l/m	l/m	0.67%
primary	test pt 3	1.469	1.490	1.51	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**	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**	70 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241795	WST109	Korey Devins	09/25/2020	Ozone	000611

Slope:	1.00016	**Slope:**	0.00000
Intercept	-0.21124	**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	0.99950	**Intercept**	0.29010
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.46	0.16	0.04	ppb		-0.12
primary	2	15.34	15.05	14.70	ppb		-0.35
primary	3	35.23	34.95	34.75	ppb	-0.57	
primary	4	68.40	68.14	68.01	ppb	-0.19	
primary	5	110.46	110.22	110.00	ppb	-0.2	

Sensor Component	Condition	Status
Audit Pressure	740.4 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	-0.2	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	95.4 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	716.1 mmHg	pass
Cell A Tmp.	35.4 C	pass
Cell B Freq.	96.4 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	717.0 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4010	WST109	Korey Devins	09/25/2020	Temperature	04313

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00797	**Intercept**	0.12950
Cert Date	2/14/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.08	0.10		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.21	0.08	0.000	0.2	C	0.08
primary	Temp Mid Range	26.54	26.20	0.000	26.1	C	-0.06
primary	Temp High Range	48.55	48.04	0.000	47.9	C	-0.1

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	WST109	Korey Devins	09/25/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.87	1.13		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00797	Intercept	0.12950
Cert Date	2/14/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.90	24.57	0.000	25.7	C	1.13
primary	Temp Mid Range	28.34	27.99	0.000	27.4	C	-0.56
primary	Temp Mid Range	27.07	26.73	0.000	27.7	C	0.93

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	WST109	Technician	Korey Devins	Site Visit Date	09/25/2020

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	Good	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	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	WST109	Korey Devins	09/25/2020	Moisture Present	Apex	4578	☐	☐

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**	09/25/2020

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** ☑	Inspected March 2020
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 Steps** ☑	

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-S3-rev002

Site ID	WST109	Technician	Korey Devins	Site Visit Date	09/25/2020

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	09/25/2020

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	09/25/2020

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	09/25/2020

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** 09/25/2020

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 2018	☑
Field Ops Manual	☑	Oct 2018	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☑
Preventive maintenance schedule	☑		☑

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	09/25/2020

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	09/25/2020

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** 09/25/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	FX2MC12	07027
DAS	Campbell	CR3000	2132	000354
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	100300020944	04925
Flow Rate	Apex	AXMC105LPMDPC	illegible	000859
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07159
Ozone	ThermoElectron Inc	49i A1NAA	1009241795	000611
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200019	000443
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	4010	04313
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*
GRC474-Martin Valvur-09/25/2020						
1	9/25/2020	Computer	Hewlett Packard	none	6560 b	5CB22906T9
2	9/25/2020	DAS	Environmental Sys Corp	90602	8816	2270
3	9/25/2020	Elevation	Elevation	None	1	None
4	9/25/2020	Filter pack flow pump	Thomas	none	107CAB110	109500000031
5	9/25/2020	flow rate	Tylan	none	FC280SAV	AW9805027
6	9/25/2020	Infrastructure	Infrastructure	none	none	none
7	9/25/2020	MFC power supply	Tylan	none	RO-32	illegible
8	9/25/2020	Modem	Sierra wireless	none	GX450	LA54620247001003
9	9/25/2020	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943902
10	9/25/2020	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450191
11	9/25/2020	Printer	Hewlett Packard	none	842C	unknown
12	9/25/2020	Sample Tower	Aluma Tower	none	FOT-10	AT-215178-00-1
13	9/25/2020	Shelter Temperature	ARS	none	none	none
14	9/25/2020	Siting Criteria	Siting Criteria	None	1	None
15	9/25/2020	Temperature2meter	RM Young	none	41432VC	029457
16	9/25/2020	Zero air pump	Werther International	none	PC70/4	531380

DAS Data Form

DAS Time Max Error: 1.17

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2270	GRC474	Martin Valvur	09/25/2020	DAS	Primary

Das Date: 9 /25/2020
Das Time: 10:08:50
Das Day: 269

Audit Date 9 /25/2020
Audit Time 10:10:00
Audit Day 269

Low Channel:

Avg Diff:	Max Diff:
0.0002	0.0004

High Channel:

Avg Diff:	Max Diff:
0.0002	0.0004

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	1/28/2020	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
15	0.0000	-0.0004	-0.0003	V	V	0.0001
15	0.1000	0.1001	0.1001	V	V	0.0000
15	0.3000	0.2997	0.2997	V	V	0.0000
15	0.5000	0.4994	0.4998	V	V	0.0004
15	0.7000	0.6993	0.6997	V	V	0.0004
15	0.9000	0.8996	0.8999	V	V	0.0003
15	1.0000	0.9998	1.0002	V	V	0.0004

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9805027	GRC474	Martin Valvur	09/25/2020	flow rate	none

Mfg	Tylan		
SN/Owner ID	illegible	none	
Parameter:	MFC power supply		

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	5/6/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
1.99%	2.06%			

Cal Factor Zero	0.135
Cal Factor Full Scale	5.406
Rotometer Reading:	3.45

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalE	PctDifference
primary	pump off	0.000	0.000	-0.19	0.0000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.18	0.0000	-0.01	l/m	l/m	
primary	test pt 1	3.057	3.060	2.71	0.0000	3.00	l/m	l/m	-1.96%
primary	test pt 2	3.062	3.060	2.70	0.0000	3.00	l/m	l/m	-1.96%
primary	test pt 3	3.064	3.060	2.70	0.0000	3.00	l/m	l/m	-2.06%

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**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1023943902	GRC474	Martin Valvur	09/25/2020	Ozone	none

Slope:	0.97316	**Slope:**	0.00000
Intercept	-0.01397	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.26	0.22	0.31	ppb		0.09
primary	2	15.78	15.70	15.14	ppb		-0.56
primary	3	35.08	34.95	33.95	ppb	-2.9	
primary	4	64.20	63.99	62.33	ppb	-2.63	
primary	5	111.64	111.31	108.30	ppb	-2.74	

Sensor Component	Condition	Status
Audit Pressure	602 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	-0.1	pass
Span	0.999	pass
Zero Voltage	0.0002	pass
Fullscale Voltage	1.000	pass
Cell A Freq.	88.9 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	595.2 mmHg	pass
Cell A Tmp.	35.2 C	pass
Cell B Freq.	81.2 kHz	pass
Cell B Noise	0.3 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	594.6 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	029457	GRC474	Martin Valvur	09/25/2020	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.28	0.35		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.05	0.07	0.0000	0.42	C	0.35
primary	Temp Mid Range	22.91	22.92	0.0000	23.19	C	0.27
primary	Temp High Rang	46.05	46.06	0.0000	46.29	C	0.23

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	Not properly sited	Status	Fail
Sensor Component	Blower	Condition	N/A	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	GRC474	Martin Valvur	09/25/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.71	1.68		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.09	24.10	0.000	23.9	C	-0.18
primary	Temp Mid Range	23.38	23.39	0.000	23.7	C	0.28
primary	Temp Mid Range	21.56	21.57	0.000	23.3	C	1.68

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	GRC474	Technician	Martin Valvur	Site Visit Date	09/25/2020

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	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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	Condition	Good	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Temperature2meter	GRC474	Martin Valvur	09/25/2020	Properly Sited	RM Young	4581	☐	☐

The lower (delta temperature sensor) shield is not mounted at 2 meters above the ground as stated in the QAPP.

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

Ozone inlet filters are changed more often if fires are burning in the area.

2 **Parameter:** DocumentationCo

Electronic copies of SOP and QAPP are updated and maintained online.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, clean, neat, and well organized. Some floor tiles are missing and broken.

4 **Parameter:** MetSensorComme

The 2-meter temperature sensor is mounted 4.2 meters above the ground, and 1.6 meters over the reflective stainless steel shelter roof. The reflective heat from the roof is likely to impact the accuracy of the temperature measurement.

5 **Parameter:** MetOpMaintCom

The signal cables are beginning to deteriorate and some signal cables are exposed to the elements and not protected.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	GRC474	**Technician**	Martin Valvur	**Site Visit Date**	09/25/2020

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Grand Canyon
Operating Group	NPS	**Map Scale**	
AQS #	04-005-8001	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, UV-B	**QAPP Latitude**	
Deposition Measurement	dry, wet, IMPROVE	**QAPP Longitude**	
Land Use	woodland - evergreen	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(928) 638-2031	**Audit Latitude**	36.058642
Site Address 1	2D Albright Ave	**Audit Longitude**	-112.183575
Site Address 2	PO Box 129	**Audit Elevation**	2070
County	Coconino	**Audit Declination**	11.5
City, State	Grand Canyon, AZ		
Zip Code	86023	**Fire Extinguisher** ☑	No inspection date
Time Zone	Arizona	**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 Steps** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition, clean, neat, and well organized. Some floor tiles are missing and broken.				
Site OK	☑	**Notes**					

Driving Directions From Flagstaff, AZ take route 180 north to the Grand Canyon National Park. The site operator's office is in the Mckee building on Albright Ave. Obtain a pass to travel the West Rim Road. The gate code is #1965. The site is a few miles along the rim road on the left just past the Abyss.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	GRC474	Technician	Martin Valvur	Site Visit Date	09/25/2020

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)	☐	Above shelter
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 2-meter temperature sensor is mounted 4.2 meters above the ground, and 1.6 meters over the reflective stainless steel shelter roof. The reflective heat from the roof is likely to impact the accuracy of the temperature measurement.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	GRC474	Technician	Martin Valvur	Site Visit Date	09/25/2020

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?**	☑	
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?**	☐	Some cables exposed

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 signal cables are beginning to deteriorate and some signal cables are exposed to the elements and not protected.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	GRC474	Technician	Martin Valvur	Site Visit Date	09/25/2020

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 GRC474 **Technician** Martin Valvur **Site Visit Date** 09/25/2020

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?	Sample tower not grounded but bolted to the shelter	

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	GRC474	Technician	Martin Valvur	Site Visit Date	09/25/2020

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	☑	Oct 2015	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑	Not current	☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	Flow & observation sections
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:

Electronic copies of SOP and QAPP are updated and maintained online.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	GRC474	Technician	Martin Valvur	Site Visit Date	09/25/2020

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	☑	Every 3 or 4 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Every 3 or 4 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?	☑	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:

Ozone inlet filters are changed more often if fires are burning in the area.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	GRC474	Technician	Martin Valvur	Site Visit Date	09/25/2020

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings 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?	☑	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	☑	Not present	☑
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 GRC474 **Technician** Martin Valvur **Site Visit Date** 09/25/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906T9	none
DAS	Environmental Sys Corp	8816	2270	90602
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB110	109500000031	none
flow rate	Tylan	FC280SAV	AW9805027	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	illegible	none
Modem	Sierra wireless	GX450	LA54620247001003	none
Ozone	ThermoElectron Inc	49i A3NAA	1023943902	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1130450191	none
Printer	Hewlett Packard	842C	unknown	none
Sample Tower	Aluma Tower	FOT-10	AT-215178-00-1	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41432VC	029457	none
Zero air pump	Werther International	PC70/4	531380	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ASH135-Korey Devins-09/27/2020						
1	9/27/2020	Computer	Dell	07033	Inspiron 15	Unknown
2	9/27/2020	DAS	Campbell	000847	CR3000	11444
3	9/27/2020	Elevation	Elevation	None	1	None
4	9/27/2020	Filter pack flow pump	Thomas	01449	107CA110	118700000595
5	9/27/2020	Flow Rate	Apex	000649	AXMC105LPMDPCV	illegible
6	9/27/2020	Infrastructure	Infrastructure	none	none	none
7	9/27/2020	Modem	Digi	07162	LR54	Unknown
8	9/27/2020	Ozone	ThermoElectron Inc	000730	49i A1NAA	1105347325
9	9/27/2020	Ozone Standard	ThermoElectron Inc	000362	49i A3NAA	0726124686
10	9/27/2020	Sample Tower	Aluma Tower	03536	A	none
11	9/27/2020	Shelter Temperature	Campbell	none	107-L	none
12	9/27/2020	Siting Criteria	Siting Criteria	None	1	None
13	9/27/2020	Temperature	RM Young	06389	41342	13994
14	9/27/2020	Zero air pump	Werther International	06923	C 70/4	000836208

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	11444	ASH135	Korey Devins	09/27/2020	DAS	Primary

Das Date: 9 /27/2020
Das Time: 12:41:10
Das Day: 271

Audit Date 9 /27/2020
Audit Time 12:41:10
Audit Day 271

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

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	1/28/2020	**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	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4995	0.4995	V	V	0.0000
7	0.7000	0.6995	0.6994	V	V	-0.0001
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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	ASH135	Korey Devins	09/27/2020	Flow Rate	000649

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00032	**Intercept**	-0.02240
Cert Date	2/17/2020	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
1.32%	1.32%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	1.6

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	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	0.00	0.000	-0.01	l/m	l/m	
primary	test pt 1	1.501	1.520	1.52	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.498	1.520	1.52	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.495	1.520	1.52	0.000	1.50	l/m	l/m	-1.32%

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**	2.0 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347325	ASH135	Korey Devins	09/27/2020	Ozone	000730

Slope:	0.98793	**Slope:**	0.00000
Intercept	-0.62522	**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	0.99950	**Intercept**	0.29010
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.35	0.05	-0.27	ppb		-0.32
primary	2	15.28	14.99	14.06	ppb		-0.93
primary	3	34.93	34.65	33.36	ppb	-3.79	
primary	4	67.58	67.32	65.81	ppb	-2.27	
primary	5	111.47	111.23	109.40	ppb	-1.66	

Sensor Component	Condition	Status
Audit Pressure	737 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Moderately clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	-0.2	pass
Span	1.018	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	93.4 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	729.4 mmHg	pass
Cell A Tmp.	35.8 C	pass
Cell B Freq.	92.2 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	730.0 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	13994	ASH135	Korey Devins	09/27/2020	Temperature	06389

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00797	**Intercept**	0.12950
Cert Date	2/14/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.12	0.27		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.21	0.08	0.000	0.4	C	0.27
primary	Temp Mid Range	25.64	25.31	0.000	25.3	C	-0.02
primary	Temp High Range	43.68	43.21	0.000	43.2	C	-0.06

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ASH135	Korey Devins	09/27/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.24	0.37		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00797	Intercept	0.12950
Cert Date	2/14/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.52	27.17	0.000	27.0	C	-0.18
primary	Temp Mid Range	27.87	27.52	0.000	27.2	C	-0.37
primary	Temp Mid Range	25.02	24.69	0.000	24.9	C	0.17

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ASH135	Technician	Korey Devins	Site Visit Date	09/27/2020

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	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition	30 m	Status	Fail
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		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**	Korey Devins	**Site Visit Date**	09/27/2020

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** ☑ 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 Steps** ☑	

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-S3-rev002

Site ID	ASH135	Technician	Korey Devins	Site Visit Date	09/27/2020

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	Korey Devins	Site Visit Date	09/27/2020

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	Korey Devins	Site Visit Date	09/27/2020

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** Korey Devins **Site Visit Date** 09/27/2020

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	Korey Devins	Site Visit Date	09/27/2020

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	☐	Oct 2001	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☑		☑

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	Korey Devins	Site Visit Date	09/27/2020

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	Korey Devins	Site Visit Date	09/27/2020

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** Korey Devins **Site Visit Date** 09/27/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07033
DAS	Campbell	CR3000	11444	000847
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	Digi	LR54	Unknown	07162
Ozone	ThermoElectron Inc	49i A1NAA	1105347325	000730
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124686	000362
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*
ABT147-Korey Devins-09/28/2020						
1	9/28/2020	Computer	Dell	07023	Inspiron 15	5C4MC12
2	9/28/2020	DAS	Campbell	000413	CR3000	2519
3	9/28/2020	Elevation	Elevation	None	1	None
4	9/28/2020	Filter pack flow pump	Thomas	02974	107CAB18	0493002469
5	9/28/2020	Flow Rate	Apex	000870	AXMC105LPMDPCV	unknown
6	9/28/2020	Infrastructure	Infrastructure	none	none	none
7	9/28/2020	Modem	Digi	07130	LR54	unknown
8	9/28/2020	Ozone	ThermoElectron Inc	000627	49i A1NAA	1009241772
9	9/28/2020	Ozone Standard	ThermoElectron Inc	000449	49i A3NAA	CM08200025
10	9/28/2020	Sample Tower	Aluma Tower	000017	B	AT-61152-A-H8-C
11	9/28/2020	Shelter Temperature	Campbell	none	107-L	none
12	9/28/2020	Siting Criteria	Siting Criteria	None	1	None
13	9/28/2020	Temperature	RM Young	04692	41342	6706
14	9/28/2020	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	Korey Devins	09/28/2020	DAS	Primary

Das Date: 9 /28/2020 **Audit Date** 9 /28/2020
Das Time: 13:01:30 **Audit Time** 13:01:29
Das Day: 272 **Audit Day** 272

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	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	1/28/2020	**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	0.6994	V	V	-0.0001
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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	unknown	ABT147	Korey Devins	09/28/2020	Flow Rate	000870

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00032	**Intercept**	-0.02240
Cert Date	2/17/2020	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.005
				Cal Factor Full Scale	1.005
0.89%	1.34%			**Rotometer Reading:**	1.6

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	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	0.01	l/m	l/m	
primary	test pt 1	1.469	1.490	1.50	0.000	1.50	l/m	l/m	0.67%
primary	test pt 2	1.471	1.490	1.50	0.000	1.51	l/m	l/m	1.34%
primary	test pt 3	1.465	1.490	1.50	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**	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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241772	ABT147	Korey Devins	09/28/2020	Ozone	000627

Slope:	0.99571	**Slope:**	0.00000
Intercept	0.08449	**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	0.99950	**Intercept**	0.29010
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.42	0.12	0.22	ppb		0.1
primary	2	15.16	14.87	14.93	ppb		0.06
primary	3	34.85	34.57	34.47	ppb	-0.29	
primary	4	67.70	67.44	67.17	ppb	-0.4	
primary	5	109.98	109.74	109.40	ppb	-0.31	

Sensor Component	Condition	Status
Audit Pressure	740.4 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	0.1	pass
Span	1.008	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	0.71 lpm	pass
Cell A Pressure	717.7 mmHg	pass
Cell A Tmp.	35.1 C	pass
Cell B Freq.	103.0 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	718.6 mmHg	pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	6706	ABT147	Korey Devins	09/28/2020	Temperature	04692

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00797	**Intercept**	0.12950
Cert Date	2/14/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.12	0.15		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.24	0.11	0.000	0.3	C	0.15
primary	Temp Mid Range	24.74	24.42	0.000	24.5	C	0.05
primary	Temp High Range	48.10	47.59	0.000	47.4	C	-0.15

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ABT147	Korey Devins	09/28/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.21	0.50		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00797	Intercept	0.12950
Cert Date	2/14/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.54	26.20	0.000	26.7	C	0.5
primary	Temp Mid Range	28.11	27.76	0.000	27.7	C	-0.02
primary	Temp Mid Range	28.15	27.80	0.000	27.9	C	0.1

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ABT147	Technician	Korey Devins	Site Visit Date	09/28/2020

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	Fair	Status	pass
Sensor Component	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition	10 m	Status	Fail
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	ABT147	Korey Devins	09/28/2020	Moisture Present	Apex	4584	☐	☐

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

Field Systems Comments

1 **Parameter:** DasComments

The met tower has been removed.

2 **Parameter:** DocumentationCo

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

3 **Parameter:** SitingCriteriaCom

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

4 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

5 **Parameter:** MetSensorComme

Temperature mounted in naturally aspirated shield on sample tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ABT147	**Technician**	Korey Devins	**Site Visit Date**	09/28/2020

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 Steps**	☑

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-S3-rev002

Site ID	ABT147	Technician	Korey Devins	Site Visit Date	09/28/2020

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	Korey Devins	Site Visit Date	09/28/2020

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	Korey Devins	Site Visit Date	09/28/2020

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	Korey Devins	Site Visit Date	09/28/2020

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	Korey Devins	Site Visit Date	09/28/2020

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	☑	Oct 2014	☑
Calibration Reports	☑	Nov 2018	☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

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	Korey Devins	Site Visit Date	09/28/2020

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	Korey Devins	Site Visit Date	09/28/2020

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 ABT147 **Technician** Korey Devins **Site Visit Date** 09/28/2020

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	unknown	000870
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07130
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*
CHA467-Martin Valvur-09/28/2020						
1	9/28/2020	Computer	Hewlett Packard	none	EliteBook	CNV13607M4
2	9/28/2020	DAS	Environmental Sys Corp	90611	8816	2613
3	9/28/2020	Elevation	Elevation	None	1	None
4	9/28/2020	Filter pack flow pump	Thomas	none	illegible	illegible
5	9/28/2020	flow rate	Tylan	none	FC280SAV	AW9706014
6	9/28/2020	Infrastructure	Infrastructure	none	none	none
7	9/28/2020	MFC power supply	Tylan	none	RO-32	FP99706005
8	9/28/2020	Modem	US Robotics	09615	56k	unknown
9	9/28/2020	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460007
10	9/28/2020	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460051
11	9/28/2020	Sample Tower	Aluma Tower	03566	A	none
12	9/28/2020	Shelter Temperature	ARS	none	none	none
13	9/28/2020	Siting Criteria	Siting Criteria	None	1	None
14	9/28/2020	Temperature2meter	RM Young	none	41342	018535
15	9/28/2020	Zero air pump	Werther International	none	PC70/4	000665785

DAS Data Form

DAS Time Max Error: 0.18

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2613	CHA467	Martin Valvur	09/28/2020	DAS	Primary

Das Date: 9 /28/2020
Das Time: 08:59:11
Das Day: 272

Audit Date 9 /28/2020
Audit Time 08:59:00
Audit Day 272

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0005	0.0002	0.0005

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	1/28/2020	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
13	0.0000	-0.0003	-0.0003	V	V	0.0000
13	0.1000	0.0998	0.0998	V	V	0.0000
13	0.3000	0.2996	0.2998	V	V	0.0002
13	0.5000	0.4997	0.4999	V	V	0.0002
13	0.7000	0.6997	0.7000	V	V	0.0003
13	0.9000	0.8996	0.8999	V	V	0.0003
13	1.0000	1.0006	1.0011	V	V	0.0005

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9706014	CHA467	Martin Valvur	09/28/2020	flow rate	none

Mfg	Tylan		
SN/Owner ID	FP99706005	none	
Parameter:	MFC power supply		

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00000	**Intercept**	0.00000
Cert Date	5/6/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
0.74%	0.80%			

Cal Factor Zero	0.488
Cal Factor Full Scale	5.847
Rotometer Reading:	3.25

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	-0.45	0.0000	0.08	l/m	l/m	
primary	leak check	0.000	0.000	-0.41	0.0000	0.09	l/m	l/m	
primary	test pt 1	2.991	2.990	2.35	0.0000	3.01	l/m	l/m	0.80%
primary	test pt 2	2.993	2.990	2.35	0.0000	3.01	l/m	l/m	0.74%
primary	test pt 3	2.990	2.990	2.35	0.0000	3.01	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**	2.0 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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460007	CHA467	Martin Valvur	09/28/2020	Ozone	none

Slope:	0.99093	**Slope:**	0.00000
Intercept	-0.07257	**Intercept**	0.00000
CorrCoff:	0.99996	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.21	0.17	0.35	ppb		0.18
primary	2	13.54	13.46	13.17	ppb		-0.29
primary	3	34.46	34.33	34.09	ppb	-0.7	
primary	4	64.81	64.60	63.32	ppb	-2	
primary	5	114.63	114.29	113.50	ppb	-0.69	

Sensor Component	Audit Pressure	**Condition**	639.8 mmHg	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Minimum distance from road met	**Condition**	True	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	26.6 degree unobstructed rule	**Condition**	True	**Status**	pass
Sensor Component	Tree dewline >10m or below inlet	**Condition**	True	**Status**	pass
Sensor Component	Offset	**Condition**	-0.1	**Status**	pass
Sensor Component	Span	**Condition**	1.019	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.000	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	0.9999	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	96.4 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	1.0 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.75 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	627.2 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	32.7 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	97.0 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	2.0 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.68 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	626.6 mmHg	**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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	018535	CHA467	Martin Valvur	09/28/2020	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.42	0.45		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.09	0.11	0.0000	0.56	C	0.45
primary	Temp Mid Range	23.33	23.34	0.0000	23.74	C	0.4
primary	Temp High Rang	48.35	48.35	0.0000	48.76	C	0.41

Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Properly Sited	Condition	Not properly sited	Status	Fail
Sensor Component	Blower	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CHA467	Martin Valvur	09/28/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.92	1.49		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	20.33	20.34	0.000	21.5	C	1.17
primary	Temp Mid Range	21.60	21.61	0.000	21.5	C	-0.09
primary	Temp Mid Range	20.23	20.24	0.000	21.7	C	1.49

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	CHA467	Technician	Martin Valvur	Site Visit Date	09/28/2020

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	Fair	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	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Temperature2meter	CHA467	Martin Valvur	09/28/2020	Properly Sited	RM Young	4423	☐	☐

The lower (delta temperature sensor) shield is not mounted at 2 meters above the ground as stated in the QAPP.

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

A large point source is located 40 km northwest of the site, just southwest of Wilcox.

2 **Parameter:** ShelterCleanNotes

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

3 **Parameter:** PollAnalyzerCom

The zero-air desiccant is saturated with moisture.

4 **Parameter:** MetSensorComme

The temperature sensor is mounted on the south side of the meteorological tower, which is attached to the shelter. The temperature sensor is 4.8 meters above the ground and 2.1 meters above the white shelter roof. The reflective heat from the shelter roof may be impacting the accuracy of the measurement.

5 **Parameter:** MetOpMaintCom

The signal cable insulation is beginning to deteriorate particularly at the base of the meteorological tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CHA467	**Technician**	Martin Valvur	**Site Visit Date**	09/28/2020

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Bowie Mountain South
Operating Group	NPS	**Map Scale**	
AQS #	04-003-8001	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, neph, IMPROVE	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	desert range, woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(520) 824-4182	**Audit Latitude**	32.009405
Site Address 1	13063 East Bontia Canyon Road	**Audit Longitude**	-109.389058
Site Address 2		**Audit Elevation**	1569
County	Cochise	**Audit Declination**	9.6
City, State	Wilcox, AZ		**Present**
Zip Code	85632	**Fire Extinguisher**	☑ Inspected June 2020
Time Zone	Mountain	**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 Steps**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, clean, well organized, and well maintained.				
Site OK	☑	**Notes**					

Driving Directions From I-10 take exit 344 (Wilcox AZ). Continue south on route 186 from Wilcox to Chiricahua National Monument, approximately 30 miles and turn left at route 181 (follow sign for Chiricahua National Monument). Continue another few miles to park entrance. The site is just before the fee both on the north side of the road about 150 meters.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CHA467	Technician	Martin Valvur	Site Visit Date	09/28/2020

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?	☐	South
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:

The temperature sensor is mounted on the south side of the meteorological tower, which is attached to the shelter. The temperature sensor is 4.8 meters above the ground and 2.1 meters above the white shelter roof. The reflective heat from the shelter roof may be impacting the accuracy of the measurement.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	CHA467	Technician	Martin Valvur	Site Visit Date	09/28/2020

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?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	Moderately 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?	☐	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 signal cable insulation is beginning to deteriorate particularly at the base of the meteorological tower.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	CHA467	Technician	Martin Valvur	Site Visit Date	09/28/2020

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 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?	☑	inline filter
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:

The zero-air desiccant is saturated with moisture.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 09/28/2020

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?** towers bolted to shelter

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	CHA467	Technician	Martin Valvur	Site Visit Date	09/28/2020

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	☑	Not current	☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedule	☐		☐

1	Is the station log properly completed during every site visit?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	Flow & observation sections
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	CHA467	Technician	Martin Valvur	Site Visit Date	09/28/2020

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	☑	Weekly	☑
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	☑	Monthly	☑
In-line Filter Replacement (at inlet)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☐		☐
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?	☑	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	CHA467	Technician	Martin Valvur	Site Visit Date	09/28/2020

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?	☑	Dataview and 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	☐		☐

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 CHA467 **Technician** Martin Valvur **Site Visit Date** 09/28/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	EliteBook	CNV13607M4	none
DAS	Environmental Sys Corp	8816	2613	90611
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	illegible	illegible	none
flow rate	Tylan	FC280SAV	AW9706014	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP99706005	none
Modem	US Robotics	56k	unknown	09615
Ozone	ThermoElectron Inc	49i A3NAA	CM08460007	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	CM08460051	none
Sample Tower	Aluma Tower	A	none	03566
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	018535	none
Zero air pump	Werther International	PC70/4	000665785	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
RED004-Eric Hebert-09/29/2020						
1	9/29/2020	DAS	Campbell	none	CR850	28383
2	9/29/2020	elevation	Elevation	none	none	none
3	9/29/2020	Filter pack flow pump	Thomas	none	1420 VP	42624821
4	9/29/2020	Flow Rate	Apex	000857	AXMC105LPMDPCV	150623
5	9/29/2020	Infrastructure	Infrastructure	none	none	none
6	9/29/2020	Modem	Sierra wireless	06950	unknown	unknown
7	9/29/2020	Sample Tower	Aluma Tower	000813	B	unknown
8	9/29/2020	siting criteria	Siting Criteria	none	none	None
9	9/29/2020	Temperature	RM Young	06986	41342	024087

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	150623	RED004	Eric Hebert	09/29/2020	Flow Rate	000857

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00032	**Intercept**	-0.02240
Cert Date	2/17/2020	**CorrCoff**	0.99997

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.017
2.76%	5.64%			**Cal Factor Full Scale**	1.004
				Rotometer Reading:	3

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	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	3.000	3.020	2.96	0.000	3.00	l/m	l/m	-0.66%
primary	test pt 2	3.022	3.040	2.95	0.000	2.98	l/m	l/m	-1.97%
primary	test pt 3	3.171	3.190	2.96	0.000	3.01	l/m	l/m	-5.64%

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**	3.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	024087	RED004	Eric Hebert	09/29/2020	Temperature	06986

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00797	**Intercept**	0.12950
Cert Date	2/14/2020	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.19	0.39		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.09	-0.22	0.000	0.2	C	0.39
primary	Temp Mid Range	29.96	29.59	0.000	29.6	C	-0.03
primary	Temp High Range	46.85	46.35	0.000	46.2	C	-0.15

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

Infrastructure Data For

Site ID	RED004	Technician	Eric Hebert	Site Visit Date	09/29/2020

Shelter Make	Shelter Model	Shelter Size

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	Not installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	N/A	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	N/A	Status	pass
Sensor Component	Shelter Door	Condition	N/A	Status	pass
Sensor Component	Shelter Roof	Condition	N/A	Status	pass
Sensor Component	Shelter Floor	Condition	N/A	Status	pass
Sensor Component	Shelter walls	Condition	N/A	Status	pass
Sensor Component	Excessive mold present	Condition	N/A	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

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition		Status	pass
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition		Status	pass
Sensor Component	Secondary road >100 vehicles/da	Condition		Status	pass
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	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.

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**	Eric Hebert	**Site Visit Date**	09/29/2020

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**	47.863837
Site Address 1		**Audit Longitude**	-94.835376
Site Address 2		**Audit Elevation**	374
County	Beltrami	**Audit Declination**	
City, State	Redby, MN		
Zip Code	56670	**Fire Extinguisher** ☐	
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 Steps** ☐	

Present

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-S3-rev002

Site ID	RED004	Technician	Eric Hebert	Site Visit Date	09/29/2020

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	Eric Hebert	Site Visit Date	09/29/2020

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	Eric Hebert	Site Visit Date	09/29/2020

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** Eric Hebert **Site Visit Date** 09/29/2020

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	Eric Hebert	Site Visit Date	09/29/2020

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 schedule	☐		☐

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	Eric Hebert	Site Visit Date	09/29/2020

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** Eric Hebert **Site Visit Date** 09/29/2020

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** Eric Hebert **Site Visit Date** 09/29/2020

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	06950
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*
CAVE-Martin Valvur-09/29/2020						
1	9/29/2020	Computer	Hewlett Packard	none	6730b	CNV94340HR
2	9/29/2020	DAS	Environmental Sys Corp	none	8832	A4890K
3	9/29/2020	Modem	Sierra wireless	none	GX450	Unknown
4	9/29/2020	Ozone	ThermoElectron Inc	none	49i A3NAA	1152780007
5	9/29/2020	Relative Humidity	Vaisala	none	HMP45C	Unknown
6	9/29/2020	Shelter Temperature	ARS	none	none	none
7	9/29/2020	Temperature2meter	Vaisala	none	HMP45C	Unknown
8	9/29/2020	Zero air pump	Werther International	none	C 120/TC	001002154

DAS Data Form

DAS Time Max Error: 0.13

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A4890K	CAVE	Martin Valvur	09/29/2020	DAS	Primary

Das Date: 9 /29/2020
Das Time: 08:17:52
Das Day: 273

Audit Date 9 /29/2020
Audit Time 08:18:00
Audit Day 273

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0003	0.0005	0.0003	0.0005

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 1/28/2020 **CorrCoff** 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
8	0.0000	-0.0006	-0.0008	V	V	-0.0002
8	0.1000	0.0997	0.1001	V	V	0.0004
8	0.3000	0.2992	0.2997	V	V	0.0005
8	0.5000	0.4993	0.4993	V	V	0.0000
8	0.7000	0.6999	0.7003	V	V	0.0004
8	0.9000	0.8993	0.8992	V	V	-0.0001
8	1.0000	0.9997	1.0000	V	V	0.0003

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1152780007	CAVE	Martin Valvur	09/29/2020	Ozone	none

Slope:	0.98485	**Slope:**	0.00000
Intercept	1.54690	**Intercept**	0.00000
CorrCoff:	0.99997	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.08	0.04	2.02	ppb		1.98
primary	2	12.48	12.41	13.35	ppb		0.94
primary	3	32.50	32.37	33.48	ppb	3.37	
primary	4	64.24	64.03	64.39	ppb	0.56	
primary	5	116.91	116.57	116.50	ppb	-0.06	

Sensor Component	Audit Pressure	**Condition**	658.7 mmHg	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Minimum distance from road met	**Condition**	True	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	26.6 degree unobstructed rule	**Condition**	True	**Status**	pass
Sensor Component	Tree dewline >10m or below inlet	**Condition**	True	**Status**	pass
Sensor Component	Offset	**Condition**	-0.9	**Status**	pass
Sensor Component	Span	**Condition**	0.993	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	132.1 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	648.1 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	31.3 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	64.9 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	647.5 mmHg	**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 Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	Unknown	CAVE	Martin Valvur	09/29/2020	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.62	0.78		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	18.89	18.90	0.0000	18.12	C	-0.78
primary	Temp Mid Range	19.74	19.75	0.0000	20.20	C	0.45

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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CAVE	Martin Valvur	09/29/2020	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.70	0.72		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00026	Intercept	-0.01710
Cert Date	1/29/2020	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	20.94	20.95	0.000	21.7	C	0.72
primary	Temp Mid Range	22.64	22.65	0.000	23.3	C	0.69
primary	Temp Mid Range	22.66	22.67	0.000	23.4	C	0.68

Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this site.

2 **Parameter:** DasComments

The instruments are being operated in a temporary building with no sample tower. The building is not grounded and there is no lightning protection for the signals.

3 **Parameter:** SiteOpsProcedures

There is no regular site operator at this time.

4 **Parameter:** DocumentationCo

The site is not visited on a regular weekly basis. The site is only visited at the direction of ARS if an instrument is not responding properly.

5 **Parameter:** ShelterCleanNotes

The equipment is housed in a temperary building.

6 **Parameter:** PollAnalyzerCom

The ozone sample train does not have a filter at the inlet. There is a filter at the back of the monitor. The zero-air desiccant is saturated.

7 **Parameter:** MetSensorComme

The 2-meter temperature sensor is temporarily mounted 1 meter above the building roof and facing south. The sensor is a combination RH/temp sensor and cannot be submerged for audit challenge. The building is likely to impact the accuracy of the measurements.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CAVE	**Technician**	Martin Valvur	**Site Visit Date**	09/29/2020

Site Sponsor (agency)	NPS	**USGS Map**	
Operating Group	NPS	**Map Scale**	
AQS #	35-151-0745	**Map Date**	
Meteorological Type			
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement		**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	32.178141
Site Address 1		**Audit Longitude**	-104.443206
Site Address 2		**Audit Elevation**	1358
County		**Audit Declination**	7
City, State	Carlsbad, NM		
Zip Code	88220		
Time Zone	Mountain		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

	Present		
Fire Extinguisher	☐		
First Aid Kit	☐		
Safety Glasses	☐		
Safety Hard Hat	☐		
Climbing Belt	☐		
Security Fence	☐		
Secure Shelter	☐		
Stable Entry Steps	☐		

Shelter Working Room	☐	**Make**		**Model**		**Shelter Size**	
Shelter Clean	☐	**Notes**	The equipment is housed in a temperary building.				
Site OK	☐	**Notes**					
Driving Directions							

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CAVE	Technician	Martin Valvur	Site Visit Date	09/29/2020

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?	☐	south
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)	☐	No
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 2-meter temperature sensor is temporarily mounted 1 meter above the building roof and facing south. The sensor is a combination RH/temp sensor and cannot be submerged for audit challenge. The building is likely to impact the accuracy of the measurements.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	CAVE	Technician	Martin Valvur	Site Visit Date	09/29/2020

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	CAVE	Technician	Martin Valvur	Site Visit Date	09/29/2020

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 10 meters
4	Describe dry dep sample tube.		N/A
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	at analyzer 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?	☑	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 ozone sample train does not have a filter at the inlet. There is a filter at the back of the monitor. The zero-air desiccant is saturated.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CAVE **Technician** Martin Valvur **Site Visit Date** 09/29/2020

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:

The instruments are being operated in a temporary building with no sample tower. The building is not grounded and there is no lightning protection for the signals.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID CAVE **Technician** Martin Valvur **Site Visit Date** 09/29/2020

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 schedule	☐		☐

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?	☐	

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 is not visited on a regular weekly basis. The site is only visited at the direction of ARS if an instrument is not responding properly.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID CAVE **Technician** Martin Valvur **Site Visit Date** 09/29/2020

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?	☐	No
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	☐		☐
Visual Inspections	☐		☐
Translator Zero/Span Tests (climatronics)	☐		☐
Manual Rain Gauge Test	☐		☐
Confirm Reasonableness of Current Values	☐		☐
Test Surface Wetness Response	☐		☐

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

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

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:

There is no regular site operator at this time.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CAVE **Technician** Martin Valvur **Site Visit Date** 09/29/2020

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	N/A
2	Are the Site Status Report Forms being completed and filed correctly?	☑	N/A
3	Are data downloads and backups being performed as scheduled?	☑	N/A
4	Are general observations being made and recorded? How?	☑	N/A
5	Are site supplies on-hand and replenished in a timely fashion?	☑	N/A
6	Are sample flow rates recorded? How?	☑	N/A
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	N/A
8	Are filters protected from contamination during handling and shipping? How?	☑	N/A
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

Dry deposition samples are not collected at this site.

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

Site ID CAVE **Technician** Martin Valvur **Site Visit Date** 09/29/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6730b	CNV94340HR	none
DAS	Environmental Sys Corp	8832	A4890K	none
Modem	Sierra wireless	GX450	Unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	1152780007	none
Relative Humidity	Vaisala	HMP45C	Unknown	none
Shelter Temperature	ARS	none	none	none
Temperature2meter	Vaisala	HMP45C	Unknown	none
Zero air pump	Werther International	C 120/TC	001002154	none

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 1/22/2021 10:32:28

SiteVisitDate	Site	Technician
09/28/2020	ABT147	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	6	0.12	c	**P**
2	Temperature max error	P	4	0.5	6	0.15	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99571	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.08449	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.10	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.06	ppb	**P**
9	Flow Rate average % difference	P	10	5	2	0.89	%	**P**
10	Flow Rate max % difference	P	10	5	2	1.34	%	**P**
11	DAS Voltage average error	P	7	0.003	70	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.21	c	**P**
13	Shelter Temperature max error	P	5	2	18	0.50	c	**P**

SiteVisitDate	Site	Technician
09/28/2020	ABT147	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:** DasComments

The met tower has been removed.

2 **Parameter:** DocumentationCo

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

3 **Parameter:** SitingCriteriaCom

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

4 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

5 **Parameter:** MetSensorComme

Temperature mounted in naturally aspirated shield on sample tower.

EEMS Spot Report

Data Compiled: 1/14/2021 10:19:48

SiteVisitDate	Site	Technician
07/29/2020	ARE128	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	12	0.13	c	**P**
2	Temperature max error	P	4	0.5	12	0.20	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97883	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.78681	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	4.9	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.43	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.26	ppb	**P**
9	Flow Rate average % difference	P	10	5	9	3.23	%	**P**
10	Flow Rate max % difference	P	10	5	9	3.23	%	**P**
11	DAS Voltage average error	P	7	0.003	84	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.45	c	**P**
13	Shelter Temperature max error	P	5	2	18	0.70	c	**P**

SiteVisitDate	Site	Technician
07/29/2020	ARE128	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:** SiteOpsProcComm

The site operator handles the filter caps with bare hands but handles the filter pack using the Ziploc filter bag.

2 **Parameter:** DasComments

The meteorological tower has been removed.

3 **Parameter:** SitingCriteriaCom

The site is located in an active orchard where spraying occurs. Fruit trees are rotated with corn and other crops.

4 **Parameter:** MetOpMaintCom

The 10-meter temperature sensor has been moved to a naturally aspirated shield on the sample tower.

EEMS Spot Report

Data Compiled: 1/22/2021 10:14:09

SiteVisitDate	Site	Technician
09/27/2020	ASH135	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	21	0.12	c	**P**
2	Temperature max error	P	4	0.5	21	0.27	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98793	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.62522	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.5	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.32	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.93	ppb	**P**
9	Flow Rate average % difference	P	10	5	3	1.32	%	**P**
10	Flow Rate max % difference	P	10	5	3	1.32	%	**P**
11	DAS Voltage average error	P	7	0.003	21	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.24	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.37	c	**P**

SiteVisitDate	Site	Technician
09/27/2020	ASH135	Korey Devins

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: 1/22/2021 13:30:47

SiteVisitDate	Site	Technician
09/22/2020	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	0.22	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.43	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	16	0.05	m/s	**P**
5	Wind Speed max error below 5m/s in m/s	P	3	0.5	16	0.20	m/s	**P**
6	Wind Speed average % difference above 5 m/s	P	3	5	16	0.0	%	**P**
7	Wind Speed max % difference above 5 m/s	P	3	5	16	0.0	%	**P**
8	Wind Speed Torque average error	P	3	0.5	1	0.40	g-cm	**P**
9	Wind Speed Torque max error	P	3	0.5	1	0.4	g-cm	**P**
10	Wind Direction Input Deg True average error (de	P	2	5	16	0.8	degrees	**P**
11	Wind Direction Input Deg True max error (deg)	P	2	5	16	2	degrees	**P**
12	Wind Direction Linearity average error (deg)	P	2	5	32	0.8	degrees	**P**
13	Wind Direction Linearity max error (deg)	P	2	5	32	2	degrees	**P**
14	Wind Direction Torque average error	P	2	30	1	12	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	3	0.21	c	**P**
17	Temperature max error	P	4	0.5	3	0.49	c	**P**
18	Relative Humidity average above 85%	P	6	10	1	1.1	%	**P**
19	Relative Humidity max above 85%	P	6	10	1	1.1	%	**P**
20	Relative Humidity average below 85%	P	6	10	2	1.8	%	**P**
21	Relative Humidity max below 85%	P	6	10	2	1.9	%	**P**
22	Solar Radiation % diff of avg	P	9	10	8	2.45	%	**P**
23	Solar Radiation % diff of max STD value	P	9	10	8	1.1	%	**P**
24	Ozone Slope	P	0	1.1	4	0.98550	unitless	**P**
25	Ozone Intercept	P	0	5	4	0.77873	ppb	**P**
26	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
27	Ozone % difference avg	P	7	10	4	1.0	%	**P**
28	Ozone Absolute Difference g1	P	7	3	1	0.96	ppb	**P**
29	Ozone Absolute Difference g2	P	7	1.5	1	0.32	ppb	**P**
30	Flow Rate average % difference	P	10	5	4	1.96	%	**P**
31	Flow Rate max % difference	P	10	5	4	1.96	%	**P**
32	DAS Voltage average error	P	7	0.003	84	0.0000	V	**P**
33	Surface Wetness Response	P	12	0.5	1	1.02		**P**

SiteVisitDate	Site	Technician
09/22/2020	BEL116	Eric Hebert

34	Shelter Temperature average error	P	5	2	21	1.18	c	**P**
35	Shelter Temperature max error	P	5	2	21	1.72	c	**P**

Field Performance Comments

1 **Parameter:** Temperature2meter **SensorComponent:** Properly Sited **CommentCode:** 5

The site is over-grown with underbrush making it difficult to check site equipment. The underbrush is beginning to encroach on the lower instrumentation.

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 encroaching on the lower temperature sensor and tipping bucket rain gauge.

EEMS Spot Report

Data Compiled: 1/19/2021 15:08:20

SiteVisitDate	Site	Technician
08/22/2020	CAD150	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	0.94902	unitless	**P**
2	Ozone Intercept	P	0	5	4	1.27959	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	1.65	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.65	ppb	**P**

EEMS Spot Report

Data Compiled: 1/15/2021 17:30:05

SiteVisitDate	Site	Technician
08/27/2020	CAN407	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	0.19	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.35	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98565	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.03337	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.0	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.36	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.32	ppb	**P**
9	Flow Rate average % difference	P	10	5	12	0.86	%	**P**
10	Flow Rate max % difference	P	10	5	12	1.22	%	**P**
11	DAS Voltage average error	P	1	0.003	7	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.56	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.79	c	**P**

SiteVisitDate	Site	Technician
08/27/2020	CAN407	Martin Valvur

Field Systems Comments

1 **Parameter:** DasComments

The shelter heating and air conditioning systems are both operating simultaneously.

2 **Parameter:** SitingCriteriaCom

The small parking lot at the visitors center is approximately 200m to the northeast.

3 **Parameter:** ShelterCleanNotes

The shelter is in good condition, well organized and well maintained.

EEMS Spot Report

Data Compiled: 1/22/2021 11:30:55

SiteVisitDate	Site	Technician
09/29/2020	CAVE	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	2	0.61	c	**Fail**
2	Temperature2meter max error	P	5	0.5	2	0.78	c	**Fail**
3	Ozone Slope	P	0	1.1	4	0.98485	unitless	**P**
4	Ozone Intercept	P	0	5	4	1.5469	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.9	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	1.98	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.94	ppb	**P**
9	DAS Voltage average error	P	8	0.003	7	0.0003	V	**P**
10	Shelter Temperature average error	P	5	2	3	0.70	c	**P**
11	Shelter Temperature max error	P	5	2	3	0.72	c	**P**

SiteVisitDate	Site	Technician
09/29/2020	CAVE	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this site.

2 **Parameter:** DasComments

The instruments are being operated in a temporary building with no sample tower. The building is not grounded and there is no lightning protection for the signals.

3 **Parameter:** SiteOpsProcedures

There is no regular site operator at this time.

4 **Parameter:** DocumentationCo

The site is not visited on a regular weekly basis. The site is only visited at the direction of ARS if an instrument is not responding properly.

5 **Parameter:** ShelterCleanNotes

The equipment is housed in a temperary building.

6 **Parameter:** MetSensorComme

The 2-meter temperature sensor is temporarily mounted 1 meter above the building roof and facing south. The sensor is a combination RH/temp sensor and cannot be submerged for audit challenge. The building is likely to impact the accuracy of the measurements.

7 **Parameter:** PollAnalyzerCom

The ozone sample train does not have a filter at the inlet. There is a filter at the back of the monitor. The zero-air desiccant is saturated.

EEMS Spot Report

Data Compiled: 1/22/2021 11:01:09

SiteVisitDate	Site	Technician
09/28/2020	CHA467	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	0.42	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.45	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99093	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.07257	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.18	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.29	ppb	**P**
9	Flow Rate average % difference	P	10	5	12	0.74	%	**P**
10	Flow Rate max % difference	P	10	5	12	0.80	%	**P**
11	DAS Voltage average error	P	13	0.003	84	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.92	c	**P**
13	Shelter Temperature max error	P	5	2	21	1.49	c	**P**

SiteVisitDate	Site	Technician
09/28/2020	CHA467	Martin Valvur

Field Performance Comments

1 **Parameter:** Temperature2meter **SensorComponent:** Properly Sited **CommentCode:** 33

The lower (delta temperature sensor) shield is not mounted at 2 meters above the ground as stated in the QAPP.

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

A large point source is located 40 km northwest of the site, just southwest of Wilcox.

2 **Parameter:** ShelterCleanNotes

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

3 **Parameter:** PollAnalyzerCom

The zero-air desiccant is saturated with moisture.

4 **Parameter:** MetSensorComme

The temperature sensor is mounted on the south side of the meteorological tower, which is attached to the shelter. The temperature sensor is 4.8 meters above the ground and 2.1 meters above the white shelter roof. The reflective heat from the shelter roof may be impacting the accuracy of the measurement.

5 **Parameter:** MetOpMaintCom

The signal cable insulation is beginning to deteriorate particularly at the base of the meteorological tower.

EEMS Spot Report

Data Compiled: 1/25/2021 16:39:13

SiteVisitDate	Site	Technician
08/24/2020	CHC432	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	0.99221	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.22496	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.5	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.35	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.08	ppb	**P**

EEMS Spot Report

Data Compiled: 1/19/2021 15:09:08

SiteVisitDate	Site	Technician
08/21/2020	CHE185	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	0.94897	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.11020	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.9	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.33	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.52	ppb	**P**

EEMS Spot Report

Data Compiled: 12/30/2020 11:22:47

SiteVisitDate	Site	Technician
07/15/2020	CNT169	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	0.99445	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.28335	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.6	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.61	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.26	ppb	**P**

EEMS Spot Report

Data Compiled: 12/29/2020 16:43:30

SiteVisitDate	Site	Technician
07/06/2020	CRM435	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	0.97287	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.04425	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.0	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.29	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.57	ppb	**P**

SiteVisitDate	Site	Technician
07/06/2020	CRM435	Martin Valvur

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The station monitor is located in the electrical room inside the visitors center.

2 **Parameter:** PollAnalyzerCom

The station does not operate a dry deposition filter system.

3 **Parameter:** MetSensorComme

The combination RH/temperature sensor could not be submerged for audit. It is mounted only two feet above the building roof.

EEMS Spot Report

Data Compiled: 12/30/2020 12:11:19

SiteVisitDate	Site	Technician
07/20/2020	CTH110	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	6	0.14	c	**P**
2	Temperature max error	P	4	0.5	6	0.24	c	**P**
3	Ozone Slope	P	0	1.1	4	0.95439	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.44109	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	5.8	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.42	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.00	ppb	**P**
9	Flow Rate average % difference	P	10	5	6	1.96	%	**P**
10	Flow Rate max % difference	P	10	5	6	1.96	%	**P**
11	DAS Voltage average error	P	7	0.003	70	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.09	c	**P**
13	Shelter Temperature max error	P	5	2	18	0.10	c	**P**

SiteVisitDate	Site	Technician
07/20/2020	CTH110	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:** DasComments

The meteorological tower has been removed and the temperature sensor has been moved to the east leg of the sample tower at 10 meters above the ground. The shield has been changed from aspirated to naturally aspirated.

2 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and a Z/S/P is performed every two weeks.

3 **Parameter:** SitingCriteriaCom

There is a point source north of Ithaca within 40 km of the site. The tree line is less than 50 m from the site. The siting is acceptable even with the noted exceptions. Trees and overgrowth have recently been removed from the site which has improved siting criteria.

4 **Parameter:** ShelterCleanNotes

The condition of the shelter walls are beginning to deteriorate.

5 **Parameter:** MetSensorComme

The temperature sensor is mounted on the east leg of the sample tower. The temperature sensor was found hanging loose outside of the shield.

EEMS Spot Report

Data Compiled: 1/19/2021 16:43:32

SiteVisitDate	Site	Technician
08/23/2020	CVL151	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	0.99856	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.72172	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.88	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.44	ppb	**P**

EEMS Spot Report

Data Compiled: 1/15/2021 18:32:49

SiteVisitDate	Site	Technician
08/29/2020	DCP114	Korey Devins

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	0.99947	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.26606	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.5	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.50	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.18	ppb	**P**

EEMS Spot Report

Data Compiled: 1/15/2021 18:18:34

SiteVisitDate	Site	Technician
08/28/2020	DIN431	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	0.14	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.32	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98984	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.43922	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.1	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.16	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.02	ppb	**P**
9	Flow Rate average % difference	P	10	5	12	1.57	%	**P**
10	Flow Rate max % difference	P	10	5	12	2.58	%	**P**
11	DAS Voltage average error	P	3	0.003	7	0.0003	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.72	c	**P**
13	Shelter Temperature max error	P	5	2	12	0.97	c	**P**

SiteVisitDate	Site	Technician
08/28/2020	DIN431	Martin Valvur

Field Systems Comments

1 **Parameter:** DasComments

All sensors, filter pack, and ozone sample inlet are on a single, crank-down tower.

2 **Parameter:** SiteOpsProcedures

The site operator is not responsible for manual zero/span/precision checks, or multipoint calibrations, of the ozone analyzer.

3 **Parameter:** DocumentationCo

There are no hardcopies of manuals and operating procedures on-site. All documentation is available via the internet. Status of updates to documentation is evaluated during TSA by EPA.

4 **Parameter:** SitingCriteriaCom

A small parking lot for park service employees is located approximately 40 meters north of the site.

5 **Parameter:** ShelterCleanNotes

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

6 **Parameter:** MetSensorComme

The ambient temperature sensor is mounted approximately 8 meters from the ground and above the shelter roof.

EEMS Spot Report

Data Compiled: 1/14/2021 14:11:55

SiteVisitDate	Site	Technician
08/13/2020	GLR468	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	0.99774	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.83009	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99984	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.7	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.31	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.42	ppb	**P**

EEMS Spot Report

Data Compiled: 1/22/2021 09:54:23

SiteVisitDate	Site	Technician
09/25/2020	GRC474	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	0.28	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.35	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97316	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.01397	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.9	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.09	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.56	ppb	**P**
9	Flow Rate average % difference	P	10	5	10	1.99	%	**P**
10	Flow Rate max % difference	P	10	5	10	2.06	%	**P**
11	DAS Voltage average error	P	15	0.003	84	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.71	c	**P**
13	Shelter Temperature max error	P	5	2	21	1.68	c	**P**

SiteVisitDate	Site	Technician
09/25/2020	GRC474	Martin Valvur

Field Performance Comments

1 **Parameter:** Temperature2meter **SensorComponent:** Properly Sited **CommentCode:** 33

The lower (delta temperature sensor) shield is not mounted at 2 meters above the ground as stated in the QAPP.

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

Ozone inlet filters are changed more often if fires are burning in the area.

2 **Parameter:** DocumentationCo

Electronic copies of SOP and QAPP are updated and maintained online.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, clean, neat, and well organized. Some floor tiles are missing and broken.

4 **Parameter:** MetSensorComme

The 2-meter temperature sensor is mounted 4.2 meters above the ground, and 1.6 meters over the reflective stainless steel shelter roof. The reflective heat from the roof is likely to impact the accuracy of the temperature measurement.

5 **Parameter:** MetOpMaintCom

The signal cables are beginning to deteriorate and some signal cables are exposed to the elements and not protected.

EEMS Spot Report

Data Compiled: 1/15/2021 16:46:07

SiteVisitDate	Site	Technician
08/10/2020	GRT434	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	2	0.37	c	**P**
2	Temperature2meter max error	P	5	0.5	2	0.48	c	**P**
3	Ozone Slope	P	0	1.1	4	1.02367	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.11388	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.3	%	**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	DAS Voltage average error	P	16	0.003	7	0.0001	V	**P**
10	Shelter Temperature average error	P	5	2	3	1.13	c	**P**
11	Shelter Temperature max error	P	5	2	3	1.81	c	**P**

SiteVisitDate	Site	Technician
08/10/2020	GRT434	Martin Valvur

Field Systems Comments

1 **Parameter:** PollAnalyzerCom

There is no dry deposition filter pack operating at this site.

EEMS Spot Report

Data Compiled: 12/30/2020 11:24:38

SiteVisitDate	Site	Technician
07/13/2020	HWF187	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	3	0.30	c	**P**
2	Temperature max error	P	4	0.5	3	0.44	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99352	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.48948	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.0	%	**P**
7	Ozone Absolute Difference g2	P	7	1.5	1	-0.51	ppb	**P**
8	Flow Rate average % difference	P	10	5	6	0.89	%	**P**
9	Flow Rate max % difference	P	10	5	6	1.34	%	**P**
10	DAS Voltage average error	P	7	0.003	77	0.0000	V	**P**
11	Shelter Temperature average error	P	5	2	21	0.22	c	**P**
12	Shelter Temperature max error	P	5	2	21	0.39	c	**P**

SiteVisitDate	Site	Technician
07/13/2020	HWF187	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:** SiteOpsProcComm

It was discussed with the operator that the outside filter change field on the SSRF refers to the ozone inlet filter and not the dry deposition filter pack.

2 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the sample train is leak tested every other week.

3 **Parameter:** SitingCriteriaCom

Trees are beginning to approach the limit for ozone inlet criteria. The conditions were discussed with the site operator.

4 **Parameter:** ShelterCleanNotes

The shelter is in fair condition.

EEMS Spot Report

Data Compiled: 12/30/2020 14:19:36

SiteVisitDate	Site	Technician
07/22/2020	KEF112	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	18	0.12	c	**P**
2	Temperature max error	P	4	0.5	18	0.18	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97185	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.24380	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.7	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.63	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.47	ppb	**P**
9	Flow Rate average % difference	P	10	5	8	3.03	%	**P**
10	Flow Rate max % difference	P	10	5	8	3.25	%	**P**
11	DAS Voltage average error	P	7	0.003	77	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.39	c	**P**
13	Shelter Temperature max error	P	5	2	18	0.58	c	**P**

SiteVisitDate	Site	Technician
07/22/2020	KEF112	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

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

2 **Parameter:** SitingCriteriaCom

The site is in a clearing within the Kane Experimental Forest, the tree line is within 10 meters of the site.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and very well organized. The floor has been replaced but the bottom of walls are beginning to deteriorate.

4 **Parameter:** PollAnalyzerCom

Trees to the east are within 10 meters of the ozone inlet and at the same height as the inlet.

EEMS Spot Report

Data Compiled: 1/14/2021 14:20:25

SiteVisitDate	Site	Technician
08/19/2020	MAC426	korey Devins

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	0.98289	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.10760	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.6	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.32	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.22	ppb	**P**

EEMS Spot Report

Data Compiled: 12/30/2020 14:21:02

SiteVisitDate	Site	Technician
07/21/2020	MKG113	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	0.10	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99187	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.09786	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.5	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.26	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.4	ppb	**P**
9	Flow Rate average % difference	P	10	5	6	3.45	%	**P**
10	Flow Rate max % difference	P	10	5	6	3.87	%	**P**
11	DAS Voltage average error	P	7	0.003	77	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.55	c	**P**
13	Shelter Temperature max error	P	5	2	18	0.71	c	**P**

SiteVisitDate	Site	Technician
07/21/2020	MKG113	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:** DasComments

The Met tower has been removed and the temperature sensor is now mounted on the sample tower in a naturally aspirated shield.

2 **Parameter:** SiteOpsProcedures

The onsite calibration line for automatic QC checks is attached downstream of the ozone inlet filter.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and organized and in good condition.

EEMS Spot Report

Data Compiled: 12/29/2020 16:44:18

SiteVisitDate	Site	Technician
07/08/2020	NPT006	Martin Valvur

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	0.25	c	**P**
2	Temperature max error	P	4	0.5	9	0.30	c	**P**
3	Ozone Slope	P	0	1.1	4	1.03208	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.55726	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99990	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.2	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.20	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.42	ppb	**P**
9	Flow Rate average % difference	P	10	5	3	1.45	%	**P**
10	Flow Rate max % difference	P	10	5	3	1.63	%	**P**
11	Shelter Temperature average error	P	5	2	9	0.58	c	**P**
12	Shelter Temperature max error	P	5	2	9	0.93	c	**P**

SiteVisitDate	Site	Technician
07/08/2020	NPT006	Martin Valvur

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell A Tmp. **CommentCode:** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

Field Systems Comments

1 **Parameter:** DasComments

The shelter air conditioner is not functioning. The shelter temperature sensor is accurate. The ozone monitor cell temperature was above acceptable limits.

2 **Parameter:** SitingCriteriaCom

Site is located in wooded mountainous area.

EEMS Spot Report

Data Compiled: 1/21/2021 21:32:06

SiteVisitDate	Site	Technician
09/24/2020	PET427	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	0.98	c	**Fail**
2	Temperature2meter max error	P	5	0.5	3	1.16	c	**Fail**
3	Ozone Slope	P	0	1.1	4	0.98244	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.04845	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.5	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.35	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.72	ppb	**P**
9	Flow Rate average % difference	P	10	5	12	6.19	%	**Fail**
10	Flow Rate max % difference	P	10	5	12	6.19	%	**Fail**
11	DAS Voltage average error	P	11	0.003	77	0.0003	V	**P**
12	Shelter Temperature average error	P	5	2	21	1.95	c	**P**
13	Shelter Temperature max error	P	5	2	21	2.42	c	**Fail**

SiteVisitDate	Site	Technician
09/24/2020	PET427	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

completing the site observation section of the SSRF was discussed with the operator. Clean gloves are now used to remove and install the dry deposition filter pack.

2 **Parameter:** ShelterCleanNotes

The shelter is in good condition, well organized and maintained.

EEMS Spot Report

Data Compiled: 1/14/2021 12:10:13

SiteVisitDate	Site	Technician
08/08/2020	PND165	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	0.97310	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.76266	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	5.5	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.31	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.48	ppb	**P**

EEMS Spot Report

Data Compiled: 12/30/2020 15:18:15

SiteVisitDate	Site	Technician
07/27/2020	PSU106	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	15	0.13	c	**P**
2	Temperature max error	P	4	0.5	15	0.31	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99347	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.54192	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.3	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.53	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.68	ppb	**P**
9	Flow Rate average % difference	P	10	5	8	3.85	%	**P**
10	Flow Rate max % difference	P	10	5	8	3.85	%	**P**
11	DAS Voltage average error	P	7	0.003	77	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.33	c	**P**
13	Shelter Temperature max error	P	5	2	18	0.48	c	**P**

SiteVisitDate	Site	Technician
07/27/2020	PSU106	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:** DasComments

The meteorological tower has been removed.

2 **Parameter:** SitingCriteriaCom

The site is within 10 km of State College which has a population of approximately 50,000. The site is located in a university agricultural research field.

3 **Parameter:** ShelterCleanNotes

The shelter is owned by the university and is clean and orderly. The site is part of the Surfrad network.

4 **Parameter:** MetOpMaintCom

The 10-meter temperature sensor is now mounted in a naturally aspirated shield on the sample tower.

EEMS Spot Report

Data Compiled: 1/22/2021 11:47:41

SiteVisitDate	Site	Technician
09/29/2020	RED004	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	12	0.19	c	**P**
2	Temperature max error	P	4	0.5	12	0.39	c	**P**
3	Flow Rate average % difference	P	10	5	3	2.76	%	**P**
4	Flow Rate max % difference	P	10	5	3	5.64	%	**Fail**

SiteVisitDate	Site	Technician
09/29/2020	RED004	Eric Hebert

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.

3 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 1/19/2021 23:15:30

SiteVisitDate	Site	Technician
09/30/2020	VOY413	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	0.98621	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.03828	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99994	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.53	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.43	ppb	**P**

EEMS Spot Report

Data Compiled: 1/1/2021 10:14:36

SiteVisitDate	Site	Technician
07/30/2020	WSP144	Korey Devins

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	0.97793	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.48678	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.9	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.32	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.88	ppb	**P**

EEMS Spot Report

Data Compiled: 1/21/2021 21:56:43

SiteVisitDate	Site	Technician
09/25/2020	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	6	0.08	c	**P**
2	Temperature max error	P	4	0.5	6	0.10	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00016	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.21124	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.8	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.12	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.35	ppb	**P**
9	Flow Rate average % difference	P	10	5	2	0.67	%	**P**
10	Flow Rate max % difference	P	10	5	2	0.67	%	**P**
11	DAS Voltage average error	P	7	0.003	63	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	18	0.87	c	**P**
13	Shelter Temperature max error	P	5	2	18	1.13	c	**P**

SiteVisitDate	Site	Technician
09/25/2020	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.

EEMS Spot Report

Data Compiled: 1/14/2021 13:50:01

SiteVisitDate	Site	Technician
08/11/2020	YEL408	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	0.98725	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.28452	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.4	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.01	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.57	ppb	**P**

EEMS Spot Report

Data Compiled: 1/14/2021 14:56:58

SiteVisitDate	Site	Technician
08/26/2020	ZIO433	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	1.01491	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.38144	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.4	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-1.57	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.11	ppb	**P**

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CNT169-Martin Valvur-07/15/2020						
1	7/15/2020	DAS	Campbell	000427	CR3000	2526
2	7/15/2020	Ozone	ThermoElectron Inc	000620	49i A1NAA	1009241793
3	7/15/2020	Ozone Standard	ThermoElectron Inc	000687	49i A3NAA	1030244809
4	7/15/2020	Zero air pump	Werther International	06925	C 70/4	000836220

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241793	CNT169	Martin Valvur	07/15/2020	Ozone	000620

Slope:	0.99445	**Slope:**	0.00000
Intercept	0.28335	**Intercept**	0.00000
CorrCoff:	0.99997	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.20	0.16	0.77	ppb		0.61
primary	2	14.81	14.73	14.47	ppb		-0.26
primary	3	34.86	34.73	34.74	ppb	0.03	
primary	4	64.64	64.43	64.66	ppb	0.36	
primary	5	112.86	112.53	112.10	ppb	-0.38	

Sensor Component	Condition	Status
Audit Pressure	530 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	-0.3	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	98.0 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.57 lpm	pass
Cell A Pressure	509.2 mmHg	pass
Cell A Tmp.	36.3 C	pass
Cell B Freq.	102.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.57 lpm	pass
Cell B Pressure	508.9 mmHg	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-Korey Devins-07/30/2020						
1	7/30/2020	DAS	Campbell	000430	CR3000	2525
2	7/30/2020	Ozone	ThermoElectron Inc	000745	49i A1NAA	1105347310
3	7/30/2020	Ozone Standard	ThermoElectron Inc	000543	49i A3NAA	0929938240
4	7/30/2020	Zero air pump	Werther International	06880	C 70/4	000814273

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347310	WSP144	Korey Devins	07/30/2020	Ozone	000745

Slope:	0.97793	**Slope:**	0.00000
Intercept	-0.48678	**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	0.99950	**Intercept**	0.29010
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.41	0.11	-0.21	ppb		-0.32
primary	2	15.58	15.29	14.41	ppb		-0.88
primary	3	34.96	34.68	33.22	ppb	-4.3	
primary	4	67.65	67.39	65.47	ppb	-2.89	
primary	5	110.01	109.77	106.90	ppb	-2.65	

Sensor Component	Condition	Status
Audit Pressure	752.5 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	0.000	pass
Span	1.013	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.0 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	730.6 mmHg	pass
Cell A Tmp.	37.4 C	pass
Cell B Freq.	90.1 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	731.5 mmHg	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*
PND165-Martin Valvur-08/08/2020						
1	8/8/2020	DAS	Campbell	000403	CR3000	2516
2	8/8/2020	Ozone	ThermoElectron Inc	000621	49i A1NAA	1009241798
3	8/8/2020	Ozone Standard	ThermoElectron Inc	000435	49i A3NAA	CM08200011
4	8/8/2020	Zero air pump	Werther International	06881	C 70/4	000815264

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241798	PND165	Martin Valvur	08/08/2020	Ozone	000621

Slope:	0.97310	**Slope:**	0.00000
Intercept	-0.76266	**Intercept**	0.00000
CorrCoff:	0.99997	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.05	0.01	-0.30	ppb		-0.31
primary	2	15.30	15.22	13.74	ppb		-1.48
primary	3	37.79	37.65	35.69	ppb	-5.34	
primary	4	69.00	68.78	66.01	ppb	-4.11	
primary	5	114.58	114.24	110.60	ppb	-3.24	

Sensor Component	Audit Pressure	**Condition**	579 mmHg	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Minimum distance from road met	**Condition**	True	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	26.6 degree unobstructed rule	**Condition**	True	**Status**	pass
Sensor Component	Tree dewline >10m or below inlet	**Condition**	True	**Status**	pass
Sensor Component	Offset	**Condition**	-0.2	**Status**	pass
Sensor Component	Span	**Condition**	1.002	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	101.6 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.62 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	566.6 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	38.0 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	90.2 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.5 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.63 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	566.0 mmHg	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
YEL408-Martin Valvur-08/11/2020						
1	8/11/2020	DAS	Environmental Sys Corp	None	8832	A4888K
2	8/11/2020	Ozone	ThermoElectron Inc	none	49i A3NAA	1172090002
3	8/11/2020	Ozone Standard	ThermoElectron Inc	none	49i A1NAB	0926938287
4	8/11/2020	Zero air pump	Werther International	none	PC 70/4	000836215

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1172090002	YEL408	Martin Valvur	08/11/2020	Ozone	none

Slope:	0.98725	**Slope:**	0.00000
Intercept	-0.28452	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.11	0.07	0.08	ppb		0.01
primary	2	15.86	15.78	15.21	ppb		-0.57
primary	3	38.42	38.28	37.29	ppb	-2.62	
primary	4	63.84	63.63	62.35	ppb	-2.03	
primary	5	112.25	111.92	110.40	ppb	-1.37	

Sensor Component	Condition	Status
Audit Pressure	574.2 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	False	Fail
Tree dewline >10m or below inlet	False	Fail
Offset	-0.1	pass
Span	0.978	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	108.2 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.64 lpm	pass
Cell A Pressure	557.3 mmHg	pass
Cell A Tmp.	34.4 C	pass
Cell B Freq.	69.9 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	557.0 mmHg	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*
GLR468-Martin Valvur-08/13/2020						
1	8/13/2020	DAS	Environmental Sys Corp	None	8864	C2600
2	8/13/2020	Ozone	ThermoElectron Inc	none	49i A3NCA	1201477661
3	8/13/2020	Ozone Standard	ThermoElectron Inc	none	49i A3NAA	0733726104
4	8/13/2020	Zero air pump	Werther International	none	PC70/4	000756725

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1201477661	GLR468	Martin Valvur	08/13/2020	Ozone	none

Slope:	0.99774	**Slope:**	0.00000
Intercept	-0.83009	**Intercept**	0.00000
CorrCoff:	0.99984	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.12	0.08	0.39	ppb		0.31
primary	2	18.39	18.15	16.73	ppb		-1.42
primary	3	36.01	35.58	33.99	ppb	-4.57	
primary	4	69.03	68.24	66.76	ppb	-2.19	
primary	5	117.63	116.31	115.80	ppb	-0.44	

Sensor Component	Condition	Status
Audit Pressure	682.5 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	False	fail
Tree dewline >10m or below inlet	True	pass
Offset	0.6	pass
Span	1.017	pass
Zero Voltage	0.0005	pass
Fullscale Voltage	1.0007	pass
Cell A Freq.	97.1 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.65 lpm	pass
Cell A Pressure	669.9 mmHg	pass
Cell A Tmp.	32.5 C	pass
Cell B Freq.	82.2 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	669.3 mmHg	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-korey Devins-08/19/2020						
1	8/19/2020	DAS	Environmental Sys Corp	none	8832	unknown4
2	8/19/2020	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745085
3	8/19/2020	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1015543061
4	8/19/2020	Zero air pump	Werther International	none	PC70/4	606489

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030745085	MAC426	korey Devins	08/19/2020	Ozone	none

Slope:	0.98289	**Slope:**	0.00000
Intercept	0.10760	**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	0.99950	**Intercept**	0.29010
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.31	0.01	0.33	ppb		0.32
primary	2	14.57	14.28	14.06	ppb		-0.22
primary	3	33.66	33.38	32.78	ppb	-1.81	
primary	4	66.60	66.34	65.20	ppb	-1.73	
primary	5	110.55	110.31	108.65	ppb	-1.52	

Sensor Component	Condition	Status
Audit Pressure	739.3 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	-0.1	pass
Span	1.003	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	98.1 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.77 lpm	pass
Cell A Pressure	731.5 mmHg	pass
Cell A Tmp.	33.9 C	pass
Cell B Freq.	105.6 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.77 lpm	pass
Cell B Pressure	732.4 mmHg	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*
CHE185-Eric Hebert-08/21/2020						
1	8/21/2020	DAS	Environmental Sys Corp	120283	8832	A0382
2	8/21/2020	Ozone	Ecotech	87161	EC9810B	10-0064
3	8/21/2020	Zero air pump	Ecotech	none	8301LC	01-0658

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Ecotech	10-0064	CHE185	Eric Hebert	08/21/2020	Ozone	87161

Slope:	0.94897	**Slope:**	0.00000
Intercept	0.11020	**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	0.99490	**Intercept**	0.32220
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.47	0.14	0.47	ppb		0.33
primary	2	11.83	11.41	10.89	ppb		-0.52
primary	3	33.72	33.13	31.56	ppb	-4.85	
primary	4	69.76	68.88	64.95	ppb	-5.87	
primary	5	109.47	108.28	103.20	ppb	-4.8	

Sensor Component	Condition	Status
Audit Pressure	732.5 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	N/A	pass
Span	0.994	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	N/A	pass
Cell A Noise	N/A	pass
Cell A Flow	0.49 lpm	pass
Cell A Pressure	701.8 torr	pass
Cell A Tmp.	32.4 C	pass
Cell B Freq.	N/A	pass
Cell B Noise	N/A	pass
Cell B Flow	N/A	pass
Cell B Pressure	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*
CAD150-Eric Hebert-08/22/2020						
1	8/22/2020	DAS	Campbell	000421	CR3000	2530
2	8/22/2020	Ozone	ThermoElectron Inc	000724	49i A1NAA	1105347328
3	8/22/2020	Ozone Standard	ThermoElectron Inc	000439	49i A3NAA	CM08200015
4	8/22/2020	Zero air pump	Werther International	06937	C 70/4	000821896

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347328	CAD150	Eric Hebert	08/22/2020	Ozone	000724

Slope:	0.94902	**Slope:**	0.00000
Intercept	1.27959	**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	0.99490	**Intercept**	0.32220
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.37	0.04	1.69	ppb		1.65
primary	2	12.47	12.05	12.70	ppb		0.65
primary	3	34.92	34.32	33.30	ppb	-3.02	
primary	4	70.24	69.36	67.15	ppb	-3.24	
primary	5	109.38	108.19	104.10	ppb	-3.85	

Sensor Component	Condition	Status
Audit Pressure	752.6 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	False	Fail
Offset	-0.3	pass
Span	1.003	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	82.5 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	665.1 mmHg	pass
Cell A Tmp.	37.4 C	pass
Cell B Freq.	82.9 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	664.5 mmHg	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*
CVL151-Eric Hebert-08/23/2020						
1	8/23/2020	DAS	Campbell	000417	CR3000	2515
2	8/23/2020	Ozone	ThermoElectron Inc	000733	49i A1NAA	1105347322
3	8/23/2020	Ozone Standard	ThermoElectron Inc	000696	49i A3NAA	1030244812
4	8/23/2020	Zero air pump	Werther International	06909	C 70/4	000829161

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347322	CVL151	Eric Hebert	08/23/2020	Ozone	000733

Slope:	0.99856	**Slope:**	0.00000
Intercept	0.72172	**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	0.99490	**Intercept**	0.32220
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.06	-0.37	0.51	ppb		0.88
primary	2	12.67	12.24	12.68	ppb		0.44
primary	3	36.77	36.15	36.85	ppb	1.92	
primary	4	69.83	68.95	69.72	ppb	1.11	
primary	5	113.23	112.01	112.50	ppb	0.44	

Sensor Component	Condition	Status
Audit Pressure	749.5 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	False	Fail
Offset	-0.5	pass
Span	1.025	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	86.4 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	712.8 mmHg	pass
Cell A Tmp.	36.4 C	pass
Cell B Freq.	91.4 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	713.5 mmHg	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*
CHC432-Martin Valvur-08/24/2020					
1 8/24/2020	DAS	Environmental Sys Corp	none	8832	A4871K
2 8/24/2020	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460049
3 8/24/2020	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1152780006
4 8/24/2020	Zero air pump	Werther International	none	P 70/4	000756726

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460049	CHC432	Martin Valvur	08/24/2020	Ozone	none

Slope:	0.99221	**Slope:**	0.00000
Intercept	0.22496	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.25	0.21	0.56	ppb		0.35
primary	2	18.26	18.17	18.25	ppb		0.08
primary	3	36.90	36.76	36.49	ppb	-0.74	
primary	4	67.24	67.02	66.77	ppb	-0.37	
primary	5	118.91	118.56	117.90	ppb	-0.56	

Sensor Component	Condition	Status
Audit Pressure	609.5 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Moderately clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	-0.1	pass
Span	0.999	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.7 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	592.5 mmHg	pass
Cell A Tmp.	32.6 C	pass
Cell B Freq.	132.4 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.63 lpm	pass
Cell B Pressure	592.2 mmHg	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*
ZIO433-Martin Valvur-08/26/2020						
1	8/26/2020	DAS	Environmental Sys Corp	none	8816	4296
2	8/26/2020	Ozone	ThermoElectron Inc	90568	49C	49C-59348-322
3	8/26/2020	Ozone Standard	ThermoElectron Inc	90728	49C	49C-70528-366
4	8/26/2020	Zero air pump	Werther International	none	PC 70/4	000706556

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-59348-322	ZIO433	Martin Valvur	08/26/2020	Ozone	90568

Slope:	1.01491	**Slope:**	0.00000
Intercept	-1.38144	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00260	**Intercept**	0.03590
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.27	0.23	-1.34	ppb		-1.57
primary	2	15.71	15.63	14.52	ppb		-1.11
primary	3	36.60	36.46	35.86	ppb	-1.66	
primary	4	67.39	67.17	66.79	ppb	-0.57	
primary	5	110.01	109.68	109.85	ppb	0.15	

Sensor Component	Condition	Status
Audit Pressure	661.4 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	1.8	pass
Span	1.043	pass
Zero Voltage	0.000	pass
Fullscale Voltage	1.000	pass
Cell A Freq.	75.2 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	645.4 mmHg	pass
Cell A Tmp.	37.8 C	pass
Cell B Freq.	83.6 mmHg	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	645.3 mmHg	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-Korey Devins-08/29/2020						
1	8/29/2020	DAS	Campbell	000345	CR3000	2124
2	8/29/2020	Ozone	ThermoElectron Inc	000702	49i A1NAA	1030244799
3	8/29/2020	Ozone Standard	ThermoElectron Inc	000374	49i A3NAA	0726124694
4	8/29/2020	Zero air pump	Werther International	06939	PC70/4	000829175

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244799	DCP114	Korey Devins	08/29/2020	Ozone	000702

Slope:	0.99947	**Slope:**	0.00000
Intercept	0.26606	**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	0.99950	**Intercept**	0.29010
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.39	0.09	0.59	ppb		0.5
primary	2	14.55	14.26	14.44	ppb		0.18
primary	3	34.54	34.26	34.42	ppb	0.47	
primary	4	67.47	67.21	67.18	ppb	-0.04	
primary	5	112.24	112.00	112.40	ppb	0.36	

Sensor Component	Condition	Status
Audit Pressure	729.9 mmHg	pass
Sample Train	Good	pass
Minimum distance from road met	True	pass
Inlet Filter Condition	Clean	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
Offset	-0.4	pass
Span	1.013	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	88.0 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.58 lpm	pass
Cell A Pressure	707.1 mmHg	pass
Cell A Tmp.	38.9 C	pass
Cell B Freq.	89.8 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	707.7 mmHg	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-Eric Hebert-09/30/2020						
1	9/30/2020	DAS	Environmental Sys Corp	90632	8816	2505
2	9/30/2020	Ozone	ThermoElectron Inc	90714	49C	49C-66828-354
3	9/30/2020	Ozone Standard	ThermoElectron Inc	90569	49C	49C-59260-322
4	9/30/2020	Zero air pump	Twin Tower Engineering	90719	TT70/E4	526294

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-66828-354	VOY413	Eric Hebert	09/30/2020	Ozone	90714

Slope:	0.98621	**Slope:**	0.00000
Intercept	-0.03828	**Intercept**	0.00000
CorrCoff:	0.99994	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	0.99490	**Intercept**	0.32220
Cert Date	1/14/2020	**CorrCoff**	0.99999

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.07	-0.25	0.28	ppb		0.53
primary	2	15.23	14.78	14.35	ppb		-0.43
primary	3	36.02	35.41	34.56	ppb	-2.43	
primary	4	67.80	66.94	65.50	ppb	-2.17	
primary	5	110.42	109.22	108.10	ppb	-1.03	

Sensor Component	Audit Pressure	**Condition**	713.5 mmHg	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Minimum distance from road met	**Condition**	True	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	26.6 degree unobstructed rule	**Condition**	False	**Status**	fail
Sensor Component	Tree dewline >10m or below inlet	**Condition**	False	**Status**	fail
Sensor Component	Offset	**Condition**	-0.2	**Status**	pass
Sensor Component	Span	**Condition**	1.002	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0011	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.0012	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	83.8 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.7 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.70 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	706.3 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	35.4 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	65.1 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.73 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	705.7 mmHg	**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass