2021 – 4th Quarter Report

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

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Table of Contents

List of Appendices

List of Tables

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	Bureau of Land Management
BLM-WSO	Bureau of Land Management – Wyoming State Office
CAL	Central Analytical Laboratory
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
HAL	Mercury Analytical Laboratory
LADCO	Lake Michigan Air Directors Consortium
lpm	liters per minute
ME DEP	Maine Department of Environmental Protection
MD DNR	Maryland Department of Natural Resources
MLM	Multilayer Model
MN PCA	Minnesota Pollution Control Agency
m/s	meters per second
mv	millivolt
NESCAUM	Northeast States for Coordinated Air Use Management
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NYDEC	New York Department of Conservation
NYSERDA	New York State Energy Research and Development Authority
OH EPA	Ohio Environmental Protection Agency
PE	Performance Evaluation
QAPP	Quality Assurance Project Plan
SCDHEC	South Carolina Department of Health and Environmental Control
SFWMD	South Florida Water Management District
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 CASTNET 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 December 2021, 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 ≤ ± 0.0015 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 Fourth Quarter 2021

This report consists of the systems and performance, and other audit results from the CASTNET sites visited during the fourth quarter (October through December) of 2021. The site locations, sponsor, visit dates, and parameters audited, are included in Table 2.

Table 2. CASTNET Site Audit Visits

Site ID	Sponsor	Date	MET	FSA	O3 PE	SO2	CO	NOy	FLOW
CHA467	NPS	10/1/2021			**1**				
CAV436	NPS	10/5/2021			**1**				
PAL190	EPA	10/6/2021		**1**	**1**				**1**
DEN417	NPS	10/12/2021			**1**				
BVL130	EPA	10/13/2021	**1**	**1**	**1**	**1**	**1**	**1**	**1**
SPD111	EPA	10/15/2021			**1**				
ESP127	EPA	10/16/2021			**1**				
STK138	EPA	10/16/2021		**1**	**1**				**1**
OXF122	EPA	10/19/2021		**1**	**1**				**1**
THR422	NPS	10/19/2021		**1**					**1**
SAN189	EPA	10/20/2021		**1**	**1**				**1**
ALH157	EPA	10/21/2021		**1**	**1**				**1**
MCK131	EPA	10/22/2021		**1**	**1**				**1**
MCK231	EPA	10/22/2021		**1**	**1**				**1**

Site ID	Sponsor	Date	MET	FSA	O3 PE	SO2	CO	NOy	FLOW
ABT147	EPA	10/24/2021			**1**				
LAV410	NPS	11/4/2021		**1**	**1**				**1**
PED108	EPA	11/10/2021		**1**	**1**				**1**
CDR119	EPA	11/11/2021		**1**	**1**				**1**
PAR107	EPA	11/12/2021		**1**	**1**				**1**
MKG113	EPA	11/29/2021			**1**				
QAK172	EPA	11/30/2021		**1**	**1**				**1**
BFT142	EPA	12/6/2021		**1**	**1**				**1**
PNF126	EPA	12/7/2021			**1**			**1**	
GRS420	NPS	12/8/2021		**1**	**1**			**1**	**1**

1.4 Audit Results

The observations and results of the systems, performance, and Ozone PE 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*.

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 and their operation. These evaluations provide quality assurance pertaining to siting, sample collection and handling, equipment operation and maintenance, record keeping and field laboratory procedures.

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

2.3 NADP Sites Visited Fourth Quarter 2021

This report presents the NADP sites surveyed during the fourth quarter (October through December) of 2021. The station locations, sponsors, network. and dates of the surveys are presented in Table 3.

Table 3. NADP Site Survey Visits

Site ID	Sponsor	Date	NTN	MDN	AMoN
AZ98	EPA / NPS	10/1/2021	**1**		**1**
AZ99	USGS	10/4/2021	**1**		
TX43	Texas A&M University / EPA	10/6/2021	**1**		**1**
MO46	US Fish and Wildlife Service	10/11/2021		**1**	
IL11	EPA	10/13/2021			**1**
TN04	EPA	10/15/2021			**1**
TN07	EPA	10/16/2021			**1**
IL37	EPA	10/16/2021			**1**
OH09	USGS / EPA	10/19/2021	**1**		**1**
NE98	EPA	10/20/2021			**1**
IL46	EPA	10/21/2021			**1**
KY03	EPA	10/22/2021			**1**
CT15	EPA	10/24/2021			**1**
CA96	NPS	11/5/2021	**1**		
VA24	EPA	11/10/2021		**1**	**1**
WV05	EPA	11/11/2021			**1**
WV18	EPA	11/12/2021			**1**
CA28	USDA-FS	11/16/2021	**1**		
MD00	MD Department of Natural Resources	11/16/2021		**1**	
VA00	USGS	11/17/2021	**1**		
WV04	USGS	11/18/2021	**1**		
PA56	EPA	11/29/2021			**1**

Site ID	Sponsor	Date	NTN	MDN	AMoN
OK06		11/30/2021		**1**	
OH99		11/30/2021			**1**
OK04		12/1/2021		**1**	
OK01		12/2/2021		**1**	
NC06		12/6/2021	**1**		**1**
NC02		12/7/2021			**1**
TN01	NPS	12/8/2021			**1**
NC29		12/16/2021	**1**		
NC08		12/17/2021		**1**	
GA99		12/20/2021	**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
CHA467-Martin Valvur-10/01/2021					
1 10/1/2021	DAS	Environmental Sys Corp	90611	8816	2613
2 10/1/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460007
3 10/1/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460051
4 10/1/2021	Zero air pump	Werther International	none	PC70/4	000665785

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460007	CHA467	Martin Valvur	10/01/2021	Ozone	none

Slope:	0.97452	**Slope:**	0.00000
Intercept	-0.26322	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.10	0.07	0.23	ppb		0.16
primary	2	17.87	17.79	16.77	ppb		-1.02
primary	3	38.44	38.29	36.82	ppb	-3.91	
primary	4	67.03	66.80	64.81	ppb	-3.02	
primary	5	118.22	117.83	114.70	ppb	-2.69	

Sensor Component	Condition	Status
Audit Pressure	638 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 2	150 m	fail
ADT >100 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.1	pass
Span	1.019	pass
Zero Voltage	0.000	pass
Fullscale Voltage	0.9998	pass
Cell A Freq.	90.1 kHz	pass
Cell A Noise	1.5 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	631.5 mmHg	pass
Cell A Tmp.	35.1 C	pass
Cell B Freq.	91.5 kHz	pass
Cell B Noise	1.9 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	631.5 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAV436-Martin Valvur-10/05/2021						
1	10/5/2021	DAS	Environmental Sys Corp	None	8864	C2602
2	10/5/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	1231755663
3	10/5/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460009
4	10/5/2021	Zero air pump	Werther International	none	C 70/4	000915011

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1231755663	CAV436	Martin Valvur	10/05/2021	Ozone	none

Slope:	0.98549	Slope:	0.00000
Intercept	-0.04320	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	1.00340	Intercept	0.02230
Cert Date	1/20/2021	CorrCoff	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.12	0.09	0.21	ppb		0.12
primary	2	16.53	16.45	16.17	ppb		-0.28
primary	3	37.66	37.52	36.78	ppb	-1.99	
primary	4	67.59	67.35	66.18	ppb	-1.75	
primary	5	116.38	115.99	114.40	ppb	-1.38	

Sensor Component	Condition	Status
Audit Pressure	655.4 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 2	150 m	Fail
ADT >100 vehicles further than 5	150 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.1	pass
Span	0.992	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	93.6 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.64 lpm	pass
Cell A Pressure	638.6 mmHg	pass
Cell A Tmp.	37.1 C	pass
Cell B Freq.	99.9 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.63 lpm	pass
Cell B Pressure	638.0 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PAL190-Martin Valvur-10/06/2021					
1 10/6/2021	Computer	Dell	07056	Inspiron 15	Unknown
2 10/6/2021	DAS	Campbell	000343	CR3000	2122
3 10/6/2021	Elevation	Elevation	None	1	None
4 10/6/2021	Filter pack flow pump	Thomas	02752	107CA110	11920011905
5 10/6/2021	Flow Rate	Apex	000654	AXMC105LPMDPCV	54774
6 10/6/2021	Infrastructure	Infrastructure	none	none	none
7 10/6/2021	Modem	Digi	07175	LR54	Illegible
8 10/6/2021	Ozone	ThermoElectron Inc	000726	49i A1NAA	1105347314
9 10/6/2021	Ozone Standard	ThermoElectron Inc	000735	49i A3NAA	0726124696
10 10/6/2021	Sample Tower	Aluma Tower	missing	B	AT-7200-582
11 10/6/2021	Shelter Temperature	Campbell	none	107-L	10755-148
12 10/6/2021	Siting Criteria	Siting Criteria	None	1	None
13 10/6/2021	Temperature	RM Young	06303	41342VO	12542
14 10/6/2021	Zero air pump	Werther International	06922	C 70/4	000836217

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2122	PAL190	Martin Valvur	10/06/2021	DAS	Primary

Das Date: 10/6 /2021
Das Time: 11:14:00
Das Day: 279

Audit Date 10/6 /2021
Audit Time 11:14:00
Audit Day 279

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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0021	0.0020	V	V	-0.0001
7	0.1000	0.0997	0.0995	V	V	-0.0002
7	0.3000	0.2996	0.2995	V	V	-0.0001
7	0.5000	0.4999	0.4996	V	V	-0.0003
7	0.7000	0.6996	0.6995	V	V	-0.0001
7	0.9000	0.8999	0.8996	V	V	-0.0003
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	54774	PAL190	Martin Valvur	10/06/2021	Flow Rate	000654

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.05
0.33%	0.33%			**Cal Factor Full Scale**	1.04
				Rotometer Reading:	3.2

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalE	PctDifference
primary	pump off	0.000	0.000	-0.03	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	-0.01	0.000	0.04	l/m	l/m	
primary	test pt 1	3.030	3.000	2.98	0.000	3.01	l/m	l/m	0.33%
primary	test pt 2	3.040	3.010	2.98	0.000	3.00	l/m	l/m	-0.33%
primary	test pt 3	3.040	3.010	2.98	0.000	3.00	l/m	l/m	-0.33%

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**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	135 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347314	PAL190	Martin Valvur	10/06/2021	Ozone	000726

Slope:	0.99513	Slope:	0.00000
Intercept	-0.19568	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	1.00340	Intercept	0.02230
Cert Date	1/20/2021	CorrCoff	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.32	0.29	0.51	ppb		0.22
primary	2	14.36	14.29	13.96	ppb		-0.33
primary	3	36.92	36.78	36.08	ppb	-1.92	
primary	4	65.46	65.23	64.39	ppb	-1.3	
primary	5	114.13	113.75	113.30	ppb	-0.4	

Sensor Component	Condition	Status
Audit Pressure	677.8 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 2	True	pass
ADT >100 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-1.1	pass
Span	1.026	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	83.5 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	651.0 mmHg	pass
Cell A Tmp.	31.9 C	pass
Cell B Freq.	90.0 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	650.7 mmHg	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12542	PAL190	Martin Valvur	10/06/2021	Temperature	06303

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99975	**Intercept**	-0.00824
Cert Date	2/9/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.07	0.14		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.12	0.13	0.000	0.1	C	-0.04
primary	Temp Mid Range	25.02	25.03	0.000	25.0	C	-0.03
primary	Temp High Range	48.19	48.21	0.000	48.4	C	0.14

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	10755-148	PAL190	Martin Valvur	10/06/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.23	0.43		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.06	25.07	0.000	25.3	C	0.23
primary	Temp Mid Range	25.31	25.32	0.000	25.3	C	-0.02
primary	Temp Mid Range	25.18	25.19	0.000	25.6	C	0.43

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**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	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**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	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
PAL190	Martin Valvur	10/06/2021

Shelter Make	Shelter Model	Shelter Size
Shelter One	E-8109-26012-2	720 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	Moisture Trap Type	Condition	Glass bottle and filter	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
Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone sample train is leak tested every two weeks.

2 **Parameter:** SitingCriteriaCom

The site is located 40 km southeast of Amarillo TX which has a population of approximately 178,000.

3 **Parameter:** ShelterCleanNotes

The shelter is in good condition.

4 **Parameter:** MetSensorComme

The meteorological tower and sensors have been removed.

5 **Parameter:** MetOpMaintCom

The temperature signal cable is showing signs of wear.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PAL190	**Technician**	Martin Valvur	**Site Visit Date**	10/06/2021

Site Sponsor (agency)	EPA	**USGS Map**	Fortress Cliff
Operating Group	TX A&M University	**Map Scale**	
AQS #	48-381-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	agriculture	**QAPP Elevation Meters**	
Terrain	Complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	34.88061
Site Address 1		**Audit Longitude**	-101.664703
Site Address 2		**Audit Elevation**	1053
County	Randall	**Audit Declination**	6.6
City, State	Canyon, TX		**Present**
Zip Code	79015	**Fire Extinguisher**	☑ No inspection date
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**	☑

Shelter Working Room	☑	**Make**	Shelter One	**Model**	E-8109-26012-2	**Shelter Size**	720 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition.				
Site OK	☑	**Notes**					

Driving Directions

From I27 take exit 99 and go east on Hungate road to the first stop sign. Turn right (south) onto Eastern which is a dirt road. At the next intersection turn left (east) on Lawrence (also dirt). Continue and follow sharp left turn onto Pullman. Continue and follow sharp right turn onto game lands. Continue through two gates and past storage building. Site will be visible on the left.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PAL190	Technician	Martin Valvur	Site Visit Date	10/06/2021

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:

The meteorological tower and sensors have been removed.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	PAL190	Technician	Martin Valvur	Site Visit Date	10/06/2021

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

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

The temperature signal cable is showing signs of wear.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	PAL190	Technician	Martin Valvur	Site Visit Date	10/06/2021

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 PAL190 **Technician** Martin Valvur **Site Visit Date** 10/06/2021

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	PAL190	Technician	Martin Valvur	Site Visit Date	10/06/2021

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	☑	Electronic copy	☑
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	PAL190	Technician	Martin Valvur	Site Visit Date	10/06/2021

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?	☑	Trained on site by MACTEC during site installation
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
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

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 is leak tested every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	PAL190	Technician	Martin Valvur	Site Visit Date	10/06/2021

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
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 PAL190 **Technician** Martin Valvur **Site Visit Date** 10/06/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07056
DAS	Campbell	CR3000	2122	000343
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	11920011905	02752
Flow Rate	Apex	AXMC105LPMDPC	54774	000654
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07175
Ozone	ThermoElectron Inc	49i A1NAA	1105347314	000726
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124696	000735
Sample Tower	Aluma Tower	B	AT-7200-582	missing
Shelter Temperature	Campbell	107-L	10755-148	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	12542	06303
Zero air pump	Werther International	C 70/4	000836217	06922

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
DEN417-Martin Valvur-10/12/2021						
1	10/12/2021	DAS	Environmental Sys Corp	90600	8816	2274
2	10/12/2021	Ozone	ThermoElectron Inc	90778	49C	49C-77033-384
3	10/12/2021	Ozone Standard	ThermoElectron Inc	none	49C	49C-71310-368
4	10/12/2021	Zero air pump	Werther International	none	PC70/4	526281

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-77033-384	DEN417	Martin Valvur	10/12/2021	Ozone	90778

Slope:	1.00407	Slope:	0.00000
Intercept	0.87987	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	1.00340	Intercept	0.02230
Cert Date	1/20/2021	CorrCoff	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.02	0.00	0.81	ppb		0.81
primary	2	15.10	15.03	15.98	ppb		0.95
primary	3	35.30	35.16	36.32	ppb	3.25	
primary	4	65.73	65.50	66.57	ppb	1.62	
primary	5	110.74	110.37	111.70	ppb	1.2	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	687.5 mmHg	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	ADT <100 vehicles further than 2	Condition	130 m	Status	Fail
Sensor Component	ADT >100 vehicles further than 5	Condition	130 m	Status	Fail
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Clean	Status	pass
Sensor Component	Offset	Condition	-1.0	Status	pass
Sensor Component	Span	Condition	1.008	Status	pass
Sensor Component	Zero Voltage	Condition	0.0002	Status	pass
Sensor Component	Fullscale Voltage	Condition	1.0001	Status	pass
Sensor Component	Cell A Freq.	Condition	74.8 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.6 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.6 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	676.3 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	35.3 C	Status	pass
Sensor Component	Cell B Freq.	Condition	60.2 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.8 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.60 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	675.8 mmHg	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*
BVL130-Korey Devins-10/13/2021						
1	10/13/2021	CO	Teledyne	000760	T300U	87
2	10/13/2021	DAS	Campbell	000332	CR3000	2111
3	10/13/2021	Elevation	Elevation	None	1	None
4	10/13/2021	Filter pack flow pump	Thomas	04860	107CAB18	060300019995
5	10/13/2021	Flow Rate	Apex	000529	AXMC105LPMDPCV	illegible
6	10/13/2021	Infrastructure	Infrastructure	none	none	none
7	10/13/2021	Met tower	Climatronics	02738	14 inch taper	none
8	10/13/2021	Modem	Digi	missing	LR54	Illegible
9	10/13/2021	Noy	Teledyne	000805	T200U	110
10	10/13/2021	Ozone	ThermoElectron Inc	000739	49i A1NAA	1105347318
11	10/13/2021	Ozone Standard	ThermoElectron Inc	000512	49i A3NAA	0922236890
12	10/13/2021	Precipitation	Texas Electronics	06334	TR-525i-HT	illegible
13	10/13/2021	Relative Humidity	Vaisala	06754	HMP50	E1140035
14	10/13/2021	Sample Tower	Aluma Tower	000182	B	unknown
15	10/13/2021	Shelter Temperature	Campbell	none	107-L	unknown
16	10/13/2021	Shield (10 meter)	RM Young	06206	Aspirated 43408	none
17	10/13/2021	Shield (2 meter)	RM Young	06166	Aspirated 43408	none
18	10/13/2021	Siting Criteria	Siting Criteria	None	1	None
19	10/13/2021	SO2	Teledyne	000787	T100U	94
20	10/13/2021	Solar Radiation	Licor	04566	LI-200	PY10653
21	10/13/2021	Solar Radiation Translator	RM Young	04340	70101-X	none
22	10/13/2021	Surface Wetness	RM Young	06151	58101	none
23	10/13/2021	Temperature	RM Young	04690	41342	6704
24	10/13/2021	Temperature2meter	RM Young	07287	41342	031778
25	10/13/2021	Wind Direction	RM Young	04666	AQ05305	61085wdr
26	10/13/2021	Wind Speed	RM Young	04666	AQ05305	61085wsp
27	10/13/2021	Zero air pump	Werther International	06926	PC70/4	000836218
28	10/13/2021	Zero air pump	Teledyne	000759	701H	576

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2111	BVL130	Korey Devins	10/13/2021	DAS	Primary

Das Date: 10/14/2021
Das Time: 09:57:00
Das Day: 287

Audit Date 10/14/2021
Audit Time 09:57:01
Audit Day 287

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	2/11/2021	**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	0.2998	V	V	0.0000
7	0.5000	0.4996	0.4997	V	V	0.0001
7	0.7000	0.6996	0.6996	V	V	0.0000
7	0.9000	0.8994	0.8995	V	V	0.0001
7	1.0000	0.9993	0.9994	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	BVL130	Korey Devins	10/13/2021	Flow Rate	000529

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Diff**	**A Max % Di**	**Cal Factor Zero**	0.009
				Cal Factor Full Scale	1.02
0.89%	1.33%			**Rotometer Reading:**	1.4

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	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	1.496	1.500	1.49	0.000	1.51	l/m	l/m	0.67%
primary	test pt 2	1.494	1.500	1.49	0.000	1.51	l/m	l/m	0.67%
primary	test pt 3	1.496	1.500	1.49	0.000	1.52	l/m	l/m	1.33%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	205 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347318	BVL130	Korey Devins	10/13/2021	Ozone	000739

Slope:	0.99738	Slope:	0.00000
Intercept	-0.60475	Intercept	0.00000
CorrCoff	1.00000	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180030022	Tfer Desc.	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	Intercept	0.30550
Cert Date	1/20/2021	CorrCoff	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.42	0.11	-0.42	ppb		-0.53
primary	2	15.87	15.49	14.80	ppb		-0.69
primary	3	35.13	34.67	33.99	ppb	-1.98	
primary	4	67.62	67.03	66.13	ppb	-1.35	
primary	5	111.30	110.52	109.70	ppb	-0.74	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	740.5 mmHg	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	ADT <100 vehicles further than 2	Condition	True	Status	pass
Sensor Component	ADT >100 vehicles further than 5	Condition	True	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Clean	Status	pass
Sensor Component	Offset	Condition	0.000	Status	pass
Sensor Component	Span	Condition	1.008	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	89.2 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.6 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.63 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	718.4 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	36.1 C	Status	pass
Sensor Component	Cell B Freq.	Condition	90.8 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.3 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.72 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	719.3 mmHg	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	61085wsp	BVL130	Korey Devins	10/13/2021	Wind Speed	04666

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA04013	**Tfer Desc.**	wind speed motor (h
Tfer ID	01255		
Slope	1.00000	**Intercept**	0.00000
Cert Date	6/14/2021	**CorrCoff**	1.00000

Prop or Cups SN	71566			
Prop or Cups Torque	0.3	**to**	0.4	
Prop Correction Facto	0.0512			

	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	01255	200	1.02	0.0	1.0		0.00	
primary	01255	400	2.05	0.0	2.1		0.00	
primary	01255	800	4.10	0.0	4.1		0.00	
primary	01255	1200	6.14	0.0	6.1	0.00%		
primary	01255	2400	12.29	0.0	12.3	0.00%		
primary		4000	20.48	0.0	20.5	0.00%		
primary		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**	Good	**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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	61085wdr	BVL130	Korey Devins	10/13/2021	Wind Direction	04666

Mfg	RM Young	**Parameter**	wind direction
Serial Number	None	**Tfer Desc.**	wind direction wheel
Tfer ID	01458		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/1/2017	**CorrCoff**	1.00000

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	191832	**Tfer Desc.**	transit
Tfer ID	01272		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/9/2021	**CorrCoff**	1.00000

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

VaneTorque 30 **to** 40 7

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	7.0	1.8		
Abs Max Err	9	5		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01458	0	☑	0.000	0	0	46.8	##########
primary	01458	45	☑	0.000	44	1	43.6	-1.
primary	01458	90	☑	0.000	88	2	44.3	##########
primary	01458	135	☑	0.000	133	2	45.2	##########
primary	01458	180	☑	0.000	183	3	49.7	##########
primary	01458	225	☑	0.000	224	1	40.8	##########
primary	01458	270	☑	0.000	269	1	45.4	##########
primary	01458	315	☑	0.000	313	2	44.2	##########
primary	01272	7	☐	0.000	0	7		
primary	01272	97	☐	0.000	88	9		
primary	01272	187	☐	0.000	183	4		
primary	01272	277	☐	0.000	269	8		

Sensor Component		Condition		Status	
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	Mast	Condition	Good	Status	pass
Sensor Component	Torque	Condition	Fair	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	See comments	Status	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	6704	BVL130	Korey Devins	10/13/2021	Temperature	04690

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00743	**Intercept**	0.21666
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.12	0.22		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.34	0.12	0.000	0.20	C	0.08
primary	Temp Mid Range	29.73	29.30	0.000	29.23	C	-0.07
primary	Temp High Range	46.10	45.54	0.000	45.32	C	-0.22

Sensor Component	Shield	**Condition**	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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	031778	BVL130	Korey Devins	10/13/2021	Temperature2meter	07287

Mfg	Extech	Parameter	Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.14	0.27		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.34	0.12	0.000	0.20	C	0.08
primary	Temp Mid Rang	29.73	29.30	0.000	29.22	C	-0.08
primary	Temp High Rang	46.10	45.54	0.000	45.27	C	-0.27

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	E1140035	BVL130	Korey Devins	10/13/2021	Relative Humidity	06754

Mfg	AZ Instruments	**Parameter**	Relative Humidity
Serial Number	10325189	**Tfer Desc.**	Psychrometer
Tfer ID	01223		
Slope	1.01102	**Intercept**	-1.94680
Cert Date	2/9/2021	**CorrCoff**	1.00000

	DAS 1: Low Range:	DAS 1: High Range	DAS 2: Low Range:	DAS 2: High Range
Abs Avg Err	1.5	2.6		
Abs Max Err	2.8	2.6		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	Psychrometer	32.8	32.2	32.8	0.000	32.6	-0.2
primary	RH Low Range	Psychrometer	52.9	51.3	52.9	0.000	55.7	2.8
primary	RH High Range	Psychrometer	99.1	99.1	99.1	0.000	96.5	-2.6

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

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Texas Electronics	illegible	BVL130	Korey Devins	10/13/2021	Precipitation	06334

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Diff	A Max % Di
1.0%	2.0%		

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

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	10 sec	0.50	0.51	in	in	ml	2.0%
primary	test 2	231.5	2	10 sec	0.50	0.50	in	in	ml	0.0%

Sensor Component	Properly Sited	Condition	45 degree rule	Status	Fail
Sensor Component	Gauge Drain Screen	Condition	Installed	Status	pass
Sensor Component	Funnel Clean	Condition	Moderately clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Moderately clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	Functioning	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY10653	BVL130	Korey Devins	10/13/2021	Solar Radiation	04566

Mfg	RM Young		
SN/Owner ID	none	04340	
Parameter	Solar Radiation Translator		

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	34341F3	**Tfer Desc.**	SR transfer sensor
Tfer ID	01245		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/3/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
4.7%	0.8%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	10/14/2021	00:00	0	0	0	
primary	10/14/2021	09:00	84	84	90	7.3%
primary	10/14/2021	10:00	152	152	157	3.1%
primary	10/14/2021	11:00	238	238	240	0.8%
primary	10/14/2021	12:00	104	104	111	6.3%
primary	10/14/2021	13:00	148	148	157	6.4%
primary	10/14/2021	14:15	142	142	154	8.1%

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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	BVL130	Korey Devins	10/13/2021	Surface Wetness	06151

Mfg	Ohmite	**Parameter**	surface wetness
Serial Number	296-1200	**Tfer Desc.**	decade box
Tfer ID	01210		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/4/2011	**CorrCoff**	1.00000

☑ **Manual Test Pass**

UseDescription	Test Type	Tfer kOhms	OutputSignal	DAS eng	OutputSignalEngUni	TferUnits	OutputSignalUnit
primary	dry	N/A	0.000	0.00	V	N/A	V
primary	wet	N/A	0.000	1.00	V	N/A	V
primary	Decade box off	190	0.000	0.00	V	kOhm	V
primary	Decade box on	170	0.000	1.00	V	kOhm	V

Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	Grid Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Grid Angle	**Condition**	About 30 deg	**Status**	pass
Sensor Component	Grid Orientation	**Condition**	North	**Status**	pass
Sensor Component	Grid Condition	**Condition**	Good	**Status**	pass
Sensor Component	Grid Type	**Condition**	Grid without holes	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	unknown	BVL130	Korey Devins	10/13/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.32	0.59		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.70	25.30	0.000	25.9	C	0.59
primary	Temp Mid Range	27.43	27.01	0.000	26.8	C	-0.17
primary	Temp Mid Range	26.49	26.08	0.000	26.3	C	0.21

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	Condition	50 m	Status	Fail
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	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	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	Large parking lot	Condition		Status	pass

Infrastructure Data For

Site ID	BVL130	Technician	Korey Devins	Site Visit Date	10/13/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2140-1)	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	Moisture Trap Type	Condition	Glass bottle and filter	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	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	BVL130	Korey Devins	10/13/2021	Moisture Present	Apex	4033	☐	☐
The filter sample tubing has drops of moisture in low sections outside the shelter.								
Wind Direction	BVL130	Korey Devins	10/13/2021	Orientation	RM Young	3188	☐	☐
The wind direction orientation is outside the acceptance limit of 5 degrees. This is due to a combined error from the crossarm alignment and sensor calibration.								

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

Ozone and NCORE sample line filters are replaced, and the sample lines are leaked tested, every 2 weeks.

2 **Parameter:** SitingCriteriaCom

The site is located in an agricultural and atmospheric research center. There are crops within 50 meters.

3 **Parameter:** ShelterCleanNotes

The shelter still smells like rodent excrement. The shelter door does not completely seal and water enters during heavy rain. The water has caused damage to the floor.

4 **Parameter:** MetSensorComme

The tipping bucket rain gage is mounted near the meteorological tower and in violation of the 45 degree rule.

5 **Parameter:** MetOpMaintCom

The signal cables are showing signs of wear and previous repair.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	BVL130	**Technician**	Korey Devins	**Site Visit Date**	10/13/2021

Site Sponsor (agency)	EPA	**USGS Map**	Bondville
Operating Group	ISWS	**Map Scale**	
AQS #	17-019-1001	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	40.0520
Deposition Measurement	dry, wet, Hg	**QAPP Longitude**	-88.3725
Land Use	agricultural	**QAPP Elevation Meters**	212
Terrain	flat	**QAPP Declination**	-2.1
Conforms to MLM	Yes	**QAPP Declination Date**	9/16/2005
Site Telephone	(217) 863-2602	**Audit Latitude**	40.052021
Site Address 1	Bondville Road Research Station	**Audit Longitude**	-88.372481
Site Address 2		**Audit Elevation**	213
County	Champaign	**Audit Declination**	-3.3
City, State	Seymour, IL		
Zip Code	61875	**Fire Extinguisher** ☑	New in 2015
Time Zone	Central	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☑	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2140-1)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter still smells like rodent excrement. The shelter door does not completely seal and water enters during heavy rain. The water has caused damage to the floor.				
Site OK	☑	**Notes**					

Driving Directions From Champaign take I-57 south to exit 229, route CR 18. Go west on CR 18 approximately 2.5 miles and turn right (north) on CR 500E. Continue approximately 1.7 miles to the Bondville Road Research Center on the left. The site is visible in the field on the right.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	BVL130	Technician	Korey Devins	Site Visit Date	10/13/2021

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?	☐	Violation of 45 degree rule
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	
11	Is it inclined approximately 30 degrees?	☑	

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

The tipping bucket rain gage is mounted near the meteorological tower and in violation of the 45 degree rule.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	BVL130	Technician	Korey Devins	Site Visit Date	10/13/2021

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

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

The signal cables are showing signs of wear and previous repair.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	BVL130	Technician	Korey Devins	Site Visit Date	10/13/2021

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, SO2, and CO 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	BVL130	Technician	Korey Devins	Site Visit Date	10/13/2021

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 BVL130 **Technician** Korey Devins **Site Visit Date** 10/13/2021

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	BVL130	Technician	Korey Devins	Site Visit Date	10/13/2021

Site operation procedures

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

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Daily	☑
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	☑	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:

Ozone and NCORE sample line filters are replaced, and the sample lines are leaked tested, every 2 weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	BVL130	Technician	Korey Devins	Site Visit Date	10/13/2021

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 BVL130 **Technician** Korey Devins **Site Visit Date** 10/13/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
CO	Teledyne	T300U	87	000760
DAS	Campbell	CR3000	2111	000332
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060300019995	04860
Flow Rate	Apex	AXMC105LPMDPC	illegible	000529
Infrastructure	Infrastructure	none	none	none
Met tower	Climatronics	14 inch taper	none	02738
Modem	Digi	LR54	Illegible	missing
Noy	Teledyne	T200U	110	000805
Ozone	ThermoElectron Inc	49i A1NAA	1105347318	000739
Ozone Standard	ThermoElectron Inc	49i A3NAA	0922236890	000512
Precipitation	Texas Electronics	TR-525i-HT	illegible	06334
Relative Humidity	Vaisala	HMP50	E1140035	06754
Sample Tower	Aluma Tower	B	unknown	000182
Shelter Temperature	Campbell	107-L	unknown	none
Shield (10 meter)	RM Young	Aspirated 43408	none	06206
Shield (2 meter)	RM Young	Aspirated 43408	none	06166
Siting Criteria	Siting Criteria	1	None	None
SO2	Teledyne	T100U	94	000787
Solar Radiation	Licor	LI-200	PY10653	04566
Solar Radiation Translator	RM Young	70101-X	none	04340
Surface Wetness	RM Young	58101	none	06151
Temperature	RM Young	41342	6704	04690
Temperature2meter	RM Young	41342	031778	07287
Wind Direction	RM Young	AQ05305	61085wdr	04666
Wind Speed	RM Young	AQ05305	61085wsp	04666
Zero air pump	Teledyne	701H	576	000759
Zero air pump	Werther International	PC70/4	000836218	06926

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SPD111-Eric Hebert-10/15/2021						
1	10/15/2021	DAS	Campbell	000405	CR3000	2522
2	10/15/2021	Ozone	ThermoElectron Inc	000742	49i A1NAA	1105347313
3	10/15/2021	Ozone Standard	ThermoElectron Inc	000437	49i A3NAA	CM08200013
4	10/15/2021	Zero air pump	Werther International	06912	C 70/4	000829177

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347313	SPD111	Eric Hebert	10/15/2021	Ozone	000742

Slope:	1.01805	**Slope:**	0.00000
Intercept	0.21647	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00560	**Intercept**	0.14070
Cert Date	4/7/2021	**CorrCoff**	0.99990

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.24	0.09	0.32	ppb		0.23
primary	2	18.44	17.96	18.45	ppb		0.49
primary	3	37.73	36.89	37.91	ppb	2.73	
primary	4	68.59	67.18	68.44	ppb	1.86	
primary	5	104.14	102.07	104.20	ppb	2.07	

Sensor Component	Condition	Status
Audit Pressure	733.0 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 2	True	pass
ADT >100 vehicles further than 5	265 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.00	pass
Span	1.005	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	94.5 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	694.1 mmHg	pass
Cell A Tmp.	38.4 C	pass
Cell B Freq.	122.5 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.65 lpm	pass
Cell B Pressure	694.3 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ESP127-Eric Hebert-10/16/2021						
1	10/16/2021	DAS	Campbell	000352	CR3000	2130
2	10/16/2021	Ozone	ThermoElectron Inc	000734	49i A1NAA	1105347317
3	10/16/2021	Ozone Standard	ThermoElectron Inc	000327	49i A3NAA	0622717852
4	10/16/2021	Zero air pump	Werther International	06874	C 70/4	000815256

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347317	ESP127	Eric Hebert	10/16/2021	Ozone	000734

Slope:	1.00811	Slope:	0.00000
Intercept	-0.28627	Intercept	0.00000
CorrCoff	0.99999	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180930075	Tfer Desc.	Ozone primary stan
Tfer ID	01115		
Slope	1.00560	Intercept	0.14070
Cert Date	4/7/2021	CorrCoff	0.99990

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.84	0.68	0.55	ppb		-0.13
primary	2	17.68	17.21	16.84	ppb		-0.37
primary	3	36.46	35.64	35.63	ppb	-0.03	
primary	4	68.64	67.23	67.61	ppb	0.56	
primary	5	112.25	110.03	110.60	ppb	0.52	

Sensor Component	Condition	Status
Audit Pressure	735.0 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 2	65 m	Fail
ADT >100 vehicles further than 5	65 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.30	pass
Span	1.003	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	87.7 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	699.8 mmHg	pass
Cell A Tmp.	33.6 C	pass
Cell B Freq.	90.2 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	698.9 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
STK138-Korey Devins-10/16/2021						
1	10/16/2021	Computer	Dell	07065	Inspiron 15	1Y3MC12
2	10/16/2021	DAS	Campbell	000349	CR3000	2128
3	10/16/2021	Elevation	Elevation	None	1	None
4	10/16/2021	Filter pack flow pump	Thomas	04923	107CAB18	060300019959
5	10/16/2021	Flow Rate	Apex	000461	AXMC105LPMDPCV	illegible
6	10/16/2021	Infrastructure	Infrastructure	none	none	none
7	10/16/2021	Modem	Digi	07179	LR54	unknown
8	10/16/2021	Ozone	ThermoElectron Inc	000625	49i A1NAA	1009241797
9	10/16/2021	Ozone Standard	ThermoElectron Inc	000688	49i A3NAA	1030244817
10	10/16/2021	Sample Tower	Aluma Tower	03554	A	none
11	10/16/2021	Shelter Temperature	Campbell	none	107-L	unknown
12	10/16/2021	Siting Criteria	Siting Criteria	None	1	None
13	10/16/2021	Temperature	RM Young	06407	41342VC	14040
14	10/16/2021	Zero air pump	Werther International	06915	C 70/4	000829162

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2128	STK138	Korey Devins	10/16/2021	DAS	Primary

Das Date: 10/16/2021
Das Time: 11:45:00
Das Day: 289

Audit Date 10/16/2021
Audit Time 11:45:00
Audit Day 289

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 2/11/2021
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	0.0998	V	V	0.0000
7	0.3000	0.2996	0.2997	V	V	0.0001
7	0.5000	0.4995	0.4995	V	V	0.0000
7	0.7000	0.6994	0.6995	V	V	0.0001
7	0.9000	0.8993	0.8993	V	V	0.0000
7	1.0000	0.9991	0.9992	V	V	0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	STK138	Korey Devins	10/16/2021	Flow Rate	000461

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.008
0.67%	0.67%			**Cal Factor Full Scale**	1.013
				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	-0.01	l/m	l/m	
primary	test pt 1	1.487	1.490	1.48	0.000	1.50	l/m	l/m	0.67%
primary	test pt 2	1.485	1.490	1.48	0.000	1.50	l/m	l/m	0.67%
primary	test pt 3	1.485	1.490	1.48	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**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241797	STK138	Korey Devins	10/16/2021	Ozone	000625

Slope:	0.99708	Slope:	0.00000
Intercept	-0.67203	Intercept	0.00000
CorrCoff	0.99999	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180030022	Tfer Desc.	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	Intercept	0.30550
Cert Date	1/20/2021	CorrCoff	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.45	0.14	-0.25	ppb		-0.39
primary	2	15.95	15.57	14.75	ppb		-0.82
primary	3	35.15	34.69	33.71	ppb	-2.87	
primary	4	66.95	66.36	65.36	ppb	-1.52	
primary	5	110.20	109.43	108.60	ppb	-0.76	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	737 mmHg	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	ADT <100 vehicles further than 2	Condition	True	Status	pass
Sensor Component	ADT >100 vehicles further than 5	Condition	True	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Clean	Status	pass
Sensor Component	Offset	Condition	0.1	Status	pass
Sensor Component	Span	Condition	1.003	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	106.1 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.6 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.64 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	706.7 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	36.4 C	Status	pass
Sensor Component	Cell B Freq.	Condition	99.2 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.6 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.51 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	707.3 mmHg	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	14040	STK138	Korey Devins	10/16/2021	Temperature	06407

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00743	**Intercept**	0.21666
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.21	0.43		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.08	-0.14	0.000	0.3	C	0.43
primary	Temp Mid Range	27.61	27.19	0.000	27.3	C	0.06
primary	Temp High Range	45.36	44.81	0.000	44.7	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

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	unknown	STK138	Korey Devins	10/16/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.39	0.62		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.92	23.53	0.000	24.2	C	0.62
primary	Temp Mid Range	24.30	23.91	0.000	24.2	C	0.25
primary	Temp Mid Range	24.06	23.67	0.000	24.0	C	0.29

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	Condition	20 m	Status	Fail
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	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	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	Large parking lot	Condition		Status	pass

Infrastructure Data For

Site ID	STK138	Technician	Korey Devins	Site Visit Date	10/16/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-21)	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	Moisture Trap Type	Condition	Glass bottle and filter	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	Glass bottle	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	STK138	Korey Devins	10/16/2021	Moisture Present	Apex	4031	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone sample train is leak tested every 2 weeks.

2 **Parameter:** SitingCriteriaCom

The site is located in a corn field on a cattle farm. Corn is planted within 10 meters.

3 **Parameter:** ShelterCleanNotes

There are signs of leaks on the walls and floor rot.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	STK138	**Technician**	Korey Devins	**Site Visit Date**	10/16/2021

Site Sponsor (agency)	EPA	**USGS Map**	Kent
Operating Group	Private	**Map Scale**	
AQS #	17-085-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	42.2872
Deposition Measurement	dry	**QAPP Longitude**	-89.9998
Land Use	agricultural	**QAPP Elevation Meters**	274
Terrain	rolling	**QAPP Declination**	1.3
Conforms to MLM	Yes	**QAPP Declination Date**	2/22/2006
Site Telephone		**Audit Latitude**	42.287216
Site Address 1	10939 E. Parker Road	**Audit Longitude**	-89.99995
Site Address 2		**Audit Elevation**	281
County	Jo Daviess	**Audit Declination**	-1.3
City, State	Stockton, IL		
Zip Code	61085	**Fire Extinguisher** ☑	new in 2015
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**	Ekto	**Model**	8810 (s/n 2149-21)	**Shelter Size**	640 cuft
Shelter Clean ☐	**Notes**	There are signs of leaks on the walls and floor rot.				
Site OK ☑	**Notes**					

Driving Directions

From Stockton go south on 78 (Main Street) for approximately 2.5 miles. As the road turns sharply to the right, continue straight onto a dirt road. There will be a stop sign at another dirt road intersection within 100 yards. Continue through that intersection, the site will be visible in the distance on a hill-side to the left. Continue another 1.5 miles bearing to the left on dirt roads to the Evans farm. The site is past both houses in the hay field.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	STK138	Technician	Korey Devins	Site Visit Date	10/16/2021

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 to sample tower
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	STK138	Technician	Korey Devins	Site Visit Date	10/16/2021

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	STK138	Technician	Korey Devins	Site Visit Date	10/16/2021

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 18 meters
4	Describe dry dep sample tube.		3/8 teflon by 18 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	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	STK138	Technician	Korey Devins	Site Visit Date	10/16/2021

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	STK138	Technician	Korey Devins	Site Visit Date	10/16/2021

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	STK138	Technician	Korey Devins	Site Visit Date	10/16/2021

Site operation procedures

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

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	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	☑	As needed	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	As needed	☑
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?	☑	Call-in only

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

The ozone sample train is leak tested every 2 weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	STK138	Technician	Korey Devins	Site Visit Date	10/16/2021

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?	☑	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 STK138 **Technician** Korey Devins **Site Visit Date** 10/16/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	1Y3MC12	07065
DAS	Campbell	CR3000	2128	000349
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060300019959	04923
Flow Rate	Apex	AXMC105LPMDPC	illegible	000461
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07179
Ozone	ThermoElectron Inc	49i A1NAA	1009241797	000625
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244817	000688
Sample Tower	Aluma Tower	A	none	03554
Shelter Temperature	Campbell	107-L	unknown	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14040	06407
Zero air pump	Werther International	C 70/4	000829162	06915

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
OXF122-Korey Devins-10/19/2021						
1	10/19/2021	Computer	Dell	07008	Inspiron 15	694MC12
2	10/19/2021	DAS	Campbell	000425	CR3000	2528
3	10/19/2021	Elevation	Elevation	None	1	None
4	10/19/2021	Filter pack flow pump	Thomas	02660	107CAB18	Illegible
5	10/19/2021	Flow Rate	Apex	000658	AXMC105LPMDPCV	unknown
6	10/19/2021	Infrastructure	Infrastructure	none	none	none
7	10/19/2021	Modem	Digi	07163	LR54	unknown
8	10/19/2021	Ozone	ThermoElectron Inc	000610	49i A1NAA	1009241778
9	10/19/2021	Ozone Standard	ThermoElectron Inc	000545	49i A3NAA	0929938241
10	10/19/2021	Sample Tower	Aluma Tower	000018	B	AT-61152-A-H8-E
11	10/19/2021	Shelter Temperature	Campbell	none	107-L	10755-148
12	10/19/2021	Siting Criteria	Siting Criteria	None	1	None
13	10/19/2021	Temperature	RM Young	07289	41342	032128
14	10/19/2021	Zero air pump	Werther International	06908	C 70/4	000821900

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2528	OXF122	Korey Devins	10/19/2021	DAS	Primary

Das Date: 10/19/2021 **Audit Date** 10/19/2021
Das Time: 12:55:15 **Audit Time** 12:55:15
Das Day: 292 **Audit Day** 292

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	2/11/2021	**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	0.0998	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	0.6994	0.6994	V	V	0.0000
7	0.9000	0.8993	0.8992	V	V	-0.0001
7	1.0000	0.9991	0.9991	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	unknown	OXF122	Korey Devins	10/19/2021	Flow Rate	000658

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.01
0.60%	0.60%			**Cal Factor Full Scale**	1.02
				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	-0.01	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	1.509	1.510	1.47	0.000	1.50	l/m	l/m	-0.60%
primary	test pt 2	1.507	1.510	1.47	0.000	1.50	l/m	l/m	-0.60%
primary	test pt 3	1.507	1.510	1.47	0.000	1.50	l/m	l/m	-0.60%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	45 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241778	OXF122	Korey Devins	10/19/2021	Ozone	000610

Slope:	1.01494	Slope:	0.00000
Intercept	-0.48717	Intercept	0.00000
CorrCoff	1.00000	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180030022	Tfer Desc.	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	Intercept	0.30550
Cert Date	1/20/2021	CorrCoff	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.42	0.11	-0.30	ppb		-0.41
primary	2	15.23	14.86	14.44	ppb		-0.42
primary	3	34.88	34.42	34.47	ppb	0.15	
primary	4	67.51	66.92	67.54	ppb	0.92	
primary	5	111.81	111.03	112.15	ppb	1	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	740.4 mmHg	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	ADT <100 vehicles further than 2	Condition	180 m	Status	fail
Sensor Component	ADT >100 vehicles further than 5	Condition	180 m	Status	fail
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Clean	Status	pass
Sensor Component	Offset	Condition	0.4	Status	pass
Sensor Component	Span	Condition	1.041	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	109.7 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.9 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.64 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	696.9 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	35.6 C	Status	pass
Sensor Component	Cell B Freq.	Condition	91.3 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.8 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.72 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	697.5 mmHg	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	032128	OXF122	Korey Devins	10/19/2021	Temperature	07289

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00743	**Intercept**	0.21666
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.10	0.13		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.24	0.02	0.000	0.1	C	0.04
primary	Temp Mid Range	26.62	26.21	0.000	26.1	C	-0.13
primary	Temp High Range	46.73	46.17	0.000	46.0	C	-0.13

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	10755-148	OXF122	Korey Devins	10/19/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.50	0.62		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	28.82	28.39	0.000	29.0	C	0.62
primary	Temp Mid Range	26.28	25.87	0.000	26.4	C	0.55
primary	Temp Mid Range	29.37	28.94	0.000	29.3	C	0.33

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	Condition	25 m	Status	Fail
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	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	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	Large parking lot	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
OXF122	Korey Devins	10/19/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2107-4)	640 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	N/A	pass
Met Tower	N/A	pass
Moisture Trap	Installed	pass
Moisture Trap Type	Glass bottle and filter	pass
Power Cables	Good	pass
Shelter Temp Control	Functioning	pass
Rotometer	Installed	pass
Sample Tower	Good	pass
Shelter Condition	Fair	pass
Shelter Door	Good	pass
Shelter Roof	Good	pass
Shelter Floor	Fair	pass
Shelter walls	Fair	pass
Excessive mold present	Fair	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		pass

Field Systems Comments

1 **Parameter:** DasComments

The met tower is operated by the university and the temperature sensor is mounted on the sample tower in a naturally aspirated shield.

2 **Parameter:** SitingCriteriaCom

The site is located in university agriculture research facility.

3 **Parameter:** ShelterCleanNotes

The shelter roof has been repaired.

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
THR422-Martin Valvur-10/19/2021						
1	10/19/2021	Computer	Hewlett Packard	none	65606	5CB1520H68
2	10/19/2021	DAS	Environmental Sys Corp	90656	8816	2600
3	10/19/2021	Elevation	Elevation	None	1	None
4	10/19/2021	Filter pack flow pump	Thomas	none	107CAB18B	061300044081
5	10/19/2021	flow rate	Tylan	02170	FC280SAV	AW901295
6	10/19/2021	Infrastructure	Infrastructure	none	none	none
7	10/19/2021	Met tower	Rohn	none	unknown	none
8	10/19/2021	MFC power supply	Tylan	03870	RO-32	FP9508008
9	10/19/2021	Ozone	ThermoElectron Inc	E00051	49i A1NAA	1153170017
10	10/19/2021	Sample Tower	Aluma Tower	none	B	AT-81077-J5
11	10/19/2021	Shelter Temperature	ARS	none	none	none
12	10/19/2021	Siting Criteria	Siting Criteria	None	1	None
13	10/19/2021	Temperature2meter	RM Young	none	41342VC	29200
14	10/19/2021	Zero air pump	Thomas	none	107CAB18	091900065266

DAS Data Form

DAS Time Max Error: 0.37

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2600	THR422	Martin Valvur	10/19/2021	DAS	Primary

Das Date: 10/19/2021
Das Time: 08:09:22
Das Day: 292

Audit Date 10/19/2021
Audit Time 08:09:00
Audit Day 292

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0004	0.0007	0.0004	0.0007

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
9	0.0000	-0.0006	-0.0002	V	V	0.0004
9	0.1000	0.1000	0.0998	V	V	-0.0002
9	0.3000	0.2996	0.2998	V	V	0.0002
9	0.5000	0.4991	0.4993	V	V	0.0002
9	0.7000	0.6990	0.6996	V	V	0.0006
9	0.9000	0.8993	0.8995	V	V	0.0002
9	1.0000	0.9994	1.0001	V	V	0.0007

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW901295	THR422	Martin Valvur	10/19/2021	flow rate	02170

Mfg	Tylan	
SN/Owner ID	FP9508008	03870
Parameter:	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.025
				Cal Factor Full Scale	5.389
11.07%	11.48%			**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	-0.03	0.0000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	2.77	0.0000	3.01	l/m	l/m	
primary	test pt 1	2.730	2.710	2.77	0.0000	3.01	l/m	l/m	11.07%
primary	test pt 2	2.740	2.720	2.77	0.0000	3.01	l/m	l/m	10.66%
primary	test pt 3	2.720	2.700	2.77	0.0000	3.01	l/m	l/m	11.48%

Sensor Component	Leak Test	**Condition**		**Status**	fail
Sensor Component	Tubing Condition	**Condition**	Poor	**Status**	Fail
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**	2.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	20 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	29200	THR422	Martin Valvur	10/19/2021	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.33	0.35		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.04	0.05	0.0000	0.37	C	0.32
primary	Temp Mid Range	22.40	22.41	0.0000	22.72	C	0.31
primary	Temp High Rang	45.88	45.90	0.0000	46.25	C	0.35

Sensor Component		Condition		Status	
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	THR422	Martin Valvur	10/19/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.56	1.28		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.12	24.13	0.000	23.8	C	-0.36
primary	Temp Mid Range	22.88	22.89	0.000	22.9	C	0.05
primary	Temp Mid Range	21.02	21.03	0.000	22.3	C	1.28

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	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	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition	300 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	Large parking lot	Condition	200 m	Status	Fail

Infrastructure Data For

Site ID	Technician	Site Visit Date
THR422	Martin Valvur	10/19/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8814 (s/n 3028-1)	896 cuft

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	THR422	Martin Valvur	10/19/2021	Leak Test	Tylan	479	☐	☐

The dry deposition sample tubing is broken and air is not being pulled through the filter pack.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Gloves are not used to handle the filter pack. The filter bag is used as a glove.

2 **Parameter:** DasComments

The met tower is no longer in use.

3 **Parameter:** SiteOpsProcedures

The ozone sample train does not have a means to introduce test gas at the sample inlet. Results of routine zero, span, precision, and any multipoint calibration checks are maintained by the state personnel who perform the tests. The two inlet filters in the sample train are creating a large pressure drop.

4 **Parameter:** SitingCriteriaCom

The site is located 200 meters from an interstate rest area, and 300 meters from interstate 94. The rest area can have parked and idling vehicles for extended periods.

5 **Parameter:** ShelterCleanNotes

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

6 **Parameter:** PollAnalyzerCom

The ozone monitor is operated by the state of North Dakota.

7 **Parameter:** MetSensorComme

The 2-meter temperature sensor is mounted to the sample tower, which is attached to the site shelter. The sensor is 3.7 meters above ground and close to the shelter.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	OXF122	**Technician**	Korey Devins	**Site Visit Date**	10/19/2021

Site Sponsor (agency)	EPA	**USGS Map**	Oxford
Operating Group	Miami University	**Map Scale**	
AQS #	39-017-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	39.5314
Deposition Measurement	dry, wet	**QAPP Longitude**	-84.7231
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	284
Terrain	gently rolling	**QAPP Declination**	5.2
Conforms to MLM	Yes	**QAPP Declination Date**	2/23/2007
Site Telephone	(513) 523-6912	**Audit Latitude**	39.531115
Site Address 1	Ecological Research Center	**Audit Longitude**	-84.723547
Site Address 2	Somerville Rd.	**Audit Elevation**	284
County	Butler	**Audit Declination**	-5.6
City, State	Oxford, OH		
Zip Code	45056	**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 2107-4)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter roof has been repaired.				
Site OK	☑	**Notes**					

Driving Directions From Oxford proceed north on route 732. Just outside of town bear right onto Somerville Road. Continue approximately 1/2 mile and turn right at the sign for the Ecological Research Center. Stay on the dirt road past the buildings. The road will turn to the right along the tree line. The site is in the field on the right.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	OXF122	Technician	Korey Devins	Site Visit Date	10/19/2021

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	OXF122	Technician	Korey Devins	Site Visit Date	10/19/2021

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	OXF122	Technician	Korey Devins	Site Visit Date	10/19/2021

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?	☑	
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	OXF122	Technician	Korey Devins	Site Visit Date	10/19/2021

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 is operated by the university and the temperature sensor is mounted on the sample tower in a naturally aspirated shield.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	OXF122	Technician	Korey Devins	Site Visit Date	10/19/2021

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	OXF122	Technician	Korey Devins	Site Visit Date	10/19/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained onsite 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	☑	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	☐		☐
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?	☑	
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	OXF122	Technician	Korey Devins	Site Visit Date	10/19/2021

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 OXF122 **Technician** Korey Devins **Site Visit Date** 10/19/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	694MC12	07008
DAS	Campbell	CR3000	2528	000425
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	Illegible	02660
Flow Rate	Apex	AXMC105LPMDPC	unknown	000658
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07163
Ozone	ThermoElectron Inc	49i A1NAA	1009241778	000610
Ozone Standard	ThermoElectron Inc	49i A3NAA	0929938241	000545
Sample Tower	Aluma Tower	B	AT-61152-A-H8-E	000018
Shelter Temperature	Campbell	107-L	10755-148	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	032128	07289
Zero air pump	Werther International	C 70/4	000821900	06908

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	THR422	**Technician**	Martin Valvur	**Site Visit Date**	10/19/2021

Site Sponsor (agency)	NPS	**USGS Map**	Fryburg NW
Operating Group	NPS and state of ND	**Map Scale**	
AQS #	38-007-0002	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, SO2, IMPROVE, PM2.5	**QAPP Latitude**	46.8947
Deposition Measurement	dry, wet	**QAPP Longitude**	-103.3778
Land Use	prairie	**QAPP Elevation Meters**	850
Terrain	rolling - complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	46.894844
Site Address 1	Painted Canyon Visitor Center	**Audit Longitude**	-103.377719
Site Address 2	Exit 32 Interstate 94	**Audit Elevation**	840
County	Billings	**Audit Declination**	8.2
City, State	Medora, ND		
Zip Code	58645	**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**	Ekto	**Model**	8814 (s/n 3028-1)	**Shelter Size**	896 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, clean and well organized.				
Site OK	☑	**Notes**					

Driving Directions From Interstate 94 take exit 32 to the Painted Canyon rest area and visitor center. The site is just east of the parking lot on a gravel road.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	THR422	Technician	Martin Valvur	Site Visit Date	10/19/2021

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:

The 2-meter temperature sensor is mounted to the sample tower, which is attached to the site shelter. The sensor is 3.7 meters above ground and close to the shelter.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	THR422	Technician	Martin Valvur	Site Visit Date	10/19/2021

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	THR422	Technician	Martin Valvur	Site Visit Date	10/19/2021

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		3/8 teflon by 10 meters and glass manifold
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 and analyzer
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:

The ozone monitor is operated by the state of North Dakota.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	THR422	Technician	Martin Valvur	Site Visit Date	10/19/2021

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 is no longer in use.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	THR422	Technician	Martin Valvur	Site Visit Date	10/19/2021

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☐		☐
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
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 section only
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	THR422	Technician	Martin Valvur	Site Visit Date	10/19/2021

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?	☐	Trained by current 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	☑	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	☐	N/A	☑
Manual Zero/Span Tests	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☐	N/A	☑
Manual Precision Level Test	☑	Every 2 weeks	☑
Analyzer Diagnostics Tests	☑	Semiannually	☑
In-line Filter Replacement (at inlet)	☑	every 2 months	☑
In-line Filter Replacement (at analyze	☑	every 2 months	☑
Sample Line Check for Dirt/Water	☐		☐
Zero Air Desiccant Check	☑	Every 2 weeks	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Not performed
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☐	Not performed
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☐	

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 means to introduce test gas at the sample inlet. Results of routine zero, span, precision, and any multipoint calibration checks are maintained by the state personnel who perform the tests. The two inlet filters in the sample train are creating a large pressure drop.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	THR422	Technician	Martin Valvur	Site Visit Date	10/19/2021

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?	☑	
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	☐		☐

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:

Gloves are not used to handle the filter pack. The filter bag is used as a glove.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID THR422 **Technician** Martin Valvur **Site Visit Date** 10/19/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	65606	5CB1520H68	none
DAS	Environmental Sys Corp	8816	2600	90656
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	061300044081	none
flow rate	Tylan	FC280SAV	AW901295	02170
Infrastructure	Infrastructure	none	none	none
Met tower	Rohn	unknown	none	none
MFC power supply	Tylan	RO-32	FP9508008	03870
Ozone	ThermoElectron Inc	49i A1NAA	1153170017	E00051
Sample Tower	Aluma Tower	B	AT-81077-J5	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	29200	none
Zero air pump	Thomas	107CAB18	091900065266	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SAN189-Martin Valvur-10/20/2021						
1	10/20/2021	Computer	Dell	07211	Latitude	2L1ZKQ2
2	10/20/2021	DAS	Campbell	000360	CR3000	2138
3	10/20/2021	Elevation	Elevation	None	1	None
4	10/20/2021	Filter pack flow pump	Thomas	06019	107CAB18	050400022576
5	10/20/2021	Flow Rate	Apex	000861	AXMC105LPMDPCV	illegible
6	10/20/2021	Infrastructure	Infrastructure	none	none	none
7	10/20/2021	Modem	Digi	07133	LR54	unknown
8	10/20/2021	Ozone	ThermoElectron Inc	000685	49i A1NAA	1030244789
9	10/20/2021	Ozone Standard	ThermoElectron Inc	000434	49i A3NAA	CM08200010
10	10/20/2021	Sample Tower	Aluma Tower	000207	B	none
11	10/20/2021	Shelter Temperature	Campbell	none	107-L	223461
12	10/20/2021	Siting Criteria	Siting Criteria	None	1	None
13	10/20/2021	Temperature	RM Young	06537	41342VC	14798
14	10/20/2021	Zero air pump	Werther International	06875	C 70/4	000814272

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2138	SAN189	Martin Valvur	10/20/2021	DAS	Primary

Das Date: 10/20/2021
Das Time: 09:15:00
Das Day: 293

Audit Date 10/20/2021
Audit Time 09:15:00
Audit Day 293

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0005	-0.0003	V	V	0.0002
7	0.1000	0.0995	0.0996	V	V	0.0001
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4989	0.4991	V	V	0.0002
7	0.7000	0.6993	0.6994	V	V	0.0001
7	0.9000	0.8991	0.8990	V	V	-0.0001
7	1.0000	0.9997	0.9997	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	SAN189	Martin Valvur	10/20/2021	Flow Rate	000861

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.05
0.22%	0.33%			**Cal Factor Full Scale**	0.95
				Rotometer Reading:	3.65

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	0.000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.05	0.000	-0.20	l/m	l/m	
primary	test pt 1	3.060	3.030	3.08	0.000	3.04	l/m	l/m	0.33%
primary	test pt 2	3.060	3.030	3.08	0.000	3.04	l/m	l/m	0.33%
primary	test pt 3	3.070	3.040	3.08	0.000	3.04	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244789	SAN189	Martin Valvur	10/20/2021	Ozone	000685

Slope:	0.96856	Slope:	0.00000
Intercept	-1.07763	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	1.00340	Intercept	0.02230
Cert Date	1/20/2021	CorrCoff	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.03	0.00	-1.17	ppb		-1.17
primary	2	14.11	14.04	12.50	ppb		-1.54
primary	3	37.37	37.23	35.02	ppb	-6.12	
primary	4	67.50	67.26	64.27	ppb	-4.55	
primary	5	116.34	115.95	111.10	ppb	-4.27	

Sensor Component	Condition	Status
Audit Pressure	724 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 2	100 m	Fail
ADT >100 vehicles further than 5	100 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.000	pass
Span	1.023	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.1 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	694.4 mmHg	pass
Cell A Tmp.	32.4 C	pass
Cell B Freq.	102 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	693.8 mmHg	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14798	SAN189	Martin Valvur	10/20/2021	Temperature	06537

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99975	**Intercept**	-0.00824
Cert Date	2/9/2021	**CorrCoff**	1.00000

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.04	0.05	0.000	0.2	C	0.15
primary	Temp Mid Range	21.53	21.54	0.000	21.6	C	0.07
primary	Temp High Range	46.99	47.01	0.000	47.4	C	0.35

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	223461	SAN189	Martin Valvur	10/20/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.28	0.65		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.90	22.91	0.000	23.6	C	0.65
primary	Temp Mid Range	26.96	26.98	0.000	27.0	C	-0.03
primary	Temp Mid Range	25.99	26.00	0.000	25.8	C	-0.16

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	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	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	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	200 m	Status	Fail
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass

Infrastructure Data For

Site ID	SAN189	Technician	Martin Valvur	Site Visit Date	10/20/2021

Shelter Make	Shelter Model	Shelter Size
Shelter One	E8109-26012	720 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	Moisture Trap Type	Condition	Filter	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	1/4 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	SAN189	Martin Valvur	10/20/2021	Accuracy	ThermoElectron	3346	☐	☐

Field Systems Comments

1 **Parameter:** DasComments

The met tower is not currently in use and it is somewhat unstable.

2 **Parameter:** DocumentationCo

The site operator reported that all instrument manuals are kept at the office.

3 **Parameter:** ShelterCleanNotes

The shelter is in very good condition.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	SAN189	**Technician**	Martin Valvur	**Site Visit Date**	10/20/2021

Site Sponsor (agency)	EPA	**USGS Map**	Santee
Operating Group	Santee Sioux Nation	**Map Scale**	
AQS #	31-107-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, SO2, NOx, CO	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	range	**QAPP Elevation Meters**	429
Terrain	rolling	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	6/21/2006
Site Telephone	(402) 857-2546	**Audit Latitude**	42.829154
Site Address 1	SR S54D	**Audit Longitude**	-97.854128
Site Address 2	Santee Sioux Indian Reservation	**Audit Elevation**	434
County	Knox	**Audit Declination**	5.0
City, State	Niobrara, NE		**Present**
Zip Code	68760	**Fire Extinguisher**	☑ No inspection date
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**	☑

Shelter Working Room ☑ **Make** Shelter One **Model** E8109-26012 **Shelter Size** 720 cuft

Shelter Clean ☑ **Notes** The shelter is in very good condition.

Site OK ☑ **Notes**

Driving Directions From Yankton, South Dakota go south on route 81. Turn right (south) at the intersection of route 12 and continue approximately 26 miles. Just past the casino and gas station, turn right (north) onto SR 54 toward Santee. Continue approximately 6.5 miles. The site will be visible through the farm gate on the left at the top of a hill just before reaching Santee.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	SAN189	Technician	Martin Valvur	Site Visit Date	10/20/2021

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	SAN189	Technician	Martin Valvur	Site Visit Date	10/20/2021

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	SAN189	Technician	Martin Valvur	Site Visit Date	10/20/2021

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 16 meters
4	Describe dry dep sample tube.		1/4 teflon by 16 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet and analyzer
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?	☑	

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	SAN189	Technician	Martin Valvur	Site Visit Date	10/20/2021

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?	☐	Temperature 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 is not currently in use and it is somewhat unstable.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	SAN189	Technician	Martin Valvur	Site Visit Date	10/20/2021

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	☑	2014	☐
HASP	☑	2014	☐
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:

The site operator reported that all instrument manuals are kept at the office.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	SAN189	Technician	Martin Valvur	Site Visit Date	10/20/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by the previous operator
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by the current 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	☑	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	☐		☐
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	☐		☐
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	SAN189	Technician	Martin Valvur	Site Visit Date	10/20/2021

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, call-in
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 SAN189 **Technician** Martin Valvur **Site Visit Date** 10/20/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Latitude	2L1ZKQ2	07211
DAS	Campbell	CR3000	2138	000360
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	050400022576	06019
Flow Rate	Apex	AXMC105LPMDPC	illegible	000861
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07133
Ozone	ThermoElectron Inc	49i A1NAA	1030244789	000685
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200010	000434
Sample Tower	Aluma Tower	B	none	000207
Shelter Temperature	Campbell	107-L	223461	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14798	06537
Zero air pump	Werther International	C 70/4	000814272	06875

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ALH157-Korey Devins-10/21/2021						
1	10/21/2021	Computer	Dell	07052	Inspiron 15	DB3MC12
2	10/21/2021	DAS	Campbell	000428	CR3000	2534
3	10/21/2021	Elevation	Elevation	None	1	None
4	10/21/2021	Filter pack flow pump	Thomas	06285	107CA18	0990007057
5	10/21/2021	Flow Rate	Apex	000595	AXMC105LPMDPCV	illegible
6	10/21/2021	Infrastructure	Infrastructure	none	none	none
7	10/21/2021	Modem	Digi	07205	LR54	Illegible
8	10/21/2021	Ozone	ThermoElectron Inc	000703	49i A1NAA	1030244805
9	10/21/2021	Ozone Standard	ThermoElectron Inc	000329	49i A3NAA	0622717853
10	10/21/2021	Sample Tower	Aluma Tower	illegible	B	none
11	10/21/2021	Shelter Temperature	Campbell	none	107-L	none
12	10/21/2021	Siting Criteria	Siting Criteria	None	1	None
13	10/21/2021	Temperature	RM Young	04945	41342VC	8897
14	10/21/2021	Zero air pump	Werther International	06925	C 70/4	000836220

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2534	ALH157	Korey Devins	10/21/2021	DAS	Primary

Das Date: 10/21/2021
Das Time: 12:30:15
Das Day: 294

Audit Date 10/21/2021
Audit Time 12:30:14
Audit Day 294

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/11/2021	**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	0.0998	0.0998	V	V	0.0000
7	0.3000	0.2997	0.2996	V	V	-0.0001
7	0.5000	0.4995	0.4994	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	ALH157	Korey Devins	10/21/2021	Flow Rate	000595

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
				Cal Factor Full Scale	1
0.04%	0.13%			**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	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.000	0.00	l/m	l/m	
primary	test pt 1	1.498	1.500	1.51	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.498	1.500	1.51	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.498	1.500	1.51	0.000	1.50	l/m	l/m	0.13%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244805	ALH157	Korey Devins	10/21/2021	Ozone	000703

Slope:	0.99079	Slope:	0.00000
Intercept	-1.30716	Intercept	0.00000
CorrCoff	0.99999	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180030022	Tfer Desc.	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	Intercept	0.30550
Cert Date	1/20/2021	CorrCoff	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.32	0.01	-1.09	ppb		-1.1
primary	2	15.30	14.93	13.50	ppb		-1.43
primary	3	34.75	34.29	32.45	ppb	-5.51	
primary	4	67.59	67.00	64.90	ppb	-3.18	
primary	5	111.94	111.16	109.00	ppb	-1.96	

Sensor Component	Condition	Status
Audit Pressure	748 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 2	True	pass
ADT >100 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.1	pass
Span	1.007	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	100 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	720.3 mmHg	pass
Cell A Tmp.	35.5 C	pass
Cell B Freq.	97.8 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	721.2 mmHg	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	8897	ALH157	Korey Devins	10/21/2021	Temperature	04945

Mfg	Extech	Parameter	Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
246.78	246.78		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary		0.00	-0.22	0.000	-247.0	C	-246.78

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	Not tested	Status	pass

Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ALH157	Korey Devins	10/21/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.32	0.56		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	28.64	28.21	0.000	28.4	C	0.22
primary	Temp Mid Range	26.23	25.82	0.000	26.0	C	0.17
primary	Temp Mid Range	27.65	27.23	0.000	27.8	C	0.56

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**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	Intensive agriculture operations	**Condition**	20 m	**Status**	Fail
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**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	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	ALH157	Technician	Korey Devins	Site Visit Date	10/21/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (2149-7)	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	Moisture Trap Type	Condition	Glass bottle and filter	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	Fair	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	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Fair	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is located on a privately operated farm which rotates corn and soy bean crops.

2 **Parameter:** ShelterCleanNotes

The shelter floor has been repaird recently. Walls have signs of leaks.

3 **Parameter:** MetSensorComme

Temperature mounted in naturally aspirated shield on sample tower.

4 **Parameter:** MetOpMaintCom

The temperature sensor is not functioning and reading -247 deg C. It was not audited.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ALH157	**Technician**	Korey Devins	**Site Visit Date**	10/21/2021

Site Sponsor (agency)	EPA	**USGS Map**	Pocahontas
Operating Group	private	**Map Scale**	
AQS #	17-119-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	38.8690
Deposition Measurement	dry, wet	**QAPP Longitude**	-89.6229
Land Use	agricultural	**QAPP Elevation Meters**	164
Terrain	flat	**QAPP Declination**	0.9
Conforms to MLM	Yes	**QAPP Declination Date**	1/28/2004
Site Telephone		**Audit Latitude**	38.869001
Site Address 1	Fairview Road	**Audit Longitude**	-89.622815
Site Address 2		**Audit Elevation**	164
County	Madison	**Audit Declination**	-1.1
City, State	Pocahontas, IL		
Zip Code	62275	**Fire Extinguisher** ☑	new in 2015
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**	Ekto	**Model**	8810 (2149-7)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter floor has been repaird recently. Walls have signs of leaks.				
Site OK	☑	**Notes**					

Driving Directions From I-70 take exit 36 (Pokey Road) north to the intersection of route 140. Turn left (west) on route 140 and continue approximately 1.5 miles. Turn left (south) onto CR 5. At the first intersection turn right (west) onto Meffert road. After the road turns left 90 degrees, turn at the first farm on the left. The site is approximately 1/2 mile on the dirt road under the power lines.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ALH157	Technician	Korey Devins	Site Visit Date	10/21/2021

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	ALH157	Technician	Korey Devins	Site Visit Date	10/21/2021

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?	☑	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:

The temperature sensor is not functioning and reading -247 deg C. It was not audited.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	ALH157	Technician	Korey Devins	Site Visit Date	10/21/2021

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:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	ALH157	Technician	Korey Devins	Site Visit Date	10/21/2021

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?	☑	Temperature 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	ALH157	Technician	Korey Devins	Site Visit Date	10/21/2021

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	ALH157	Technician	Korey Devins	Site Visit Date	10/21/2021

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?	☐	Trained by current 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	☑	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	☐		☑
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	☐		☐

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	ALH157	Technician	Korey Devins	Site Visit Date	10/21/2021

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 ALH157 **Technician** Korey Devins **Site Visit Date** 10/21/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	DB3MC12	07052
DAS	Campbell	CR3000	2534	000428
DAS	Campbell	CR3000	2535	000429
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	0990007057	06285
Flow Rate	Apex	AXMC105LPMDPC	illegible	000595
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07205
Ozone	ThermoElectron Inc	49i A1NAA	1030244805	000703
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717853	000329
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	8897	04945
Zero air pump	Werther International	C 70/4	000836220	06925

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MCK131-Korey Devins-10/22/2021						
1	10/22/2021	Computer	Dell	07039	Inspiron 15	7M2MC12
2	10/22/2021	DAS	Campbell	000429	CR3000	2535
3	10/22/2021	Elevation	Elevation	None	1	None
4	10/22/2021	Filter pack flow pump	Thomas	00497	107CA18	118700000596
5	10/22/2021	Flow Rate	Apex	000600	AXMC105LPMDPCV	illegible
6	10/22/2021	Infrastructure	Infrastructure	none	none	none
7	10/22/2021	Modem	Digi	07177	LR54	unknown
8	10/22/2021	Ozone	ThermoElectron Inc	000613	49i A1NAA	1009241783
9	10/22/2021	Ozone Standard	ThermoElectron Inc	000453	49i A3NAA	CM08200027
10	10/22/2021	Sample Tower	Aluma Tower	03514	A	none
11	10/22/2021	Shelter Temperature	Campbell	none	107-L	none
12	10/22/2021	Siting Criteria	Siting Criteria	None	1	None
13	10/22/2021	Temperature	RM Young	07002	41342	023293
14	10/22/2021	Zero air pump	Werther International	06911	PC70/4	000829167

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2535	MCK131	Korey Devins	10/22/2021	DAS	Primary

Das Date: 10/22/2021 **Audit Date** 10/22/2021
Das Time: 15:03:45 **Audit Time** 15:03:45
Das Day: 295 **Audit Day** 295

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	2/11/2021	**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	0.0998	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	0.6994	0.6994	V	V	0.0000
7	0.9000	0.8993	0.8993	V	V	0.0000
7	1.0000	0.9992	0.9992	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	MCK131	Korey Devins	10/22/2021	Flow Rate	000600

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.041
0.44%	0.66%			**Cal Factor Full Scale**	0.959
				Rotometer Reading:	1.3

Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalU	PctDifference
primary	pump off	0.000	0.000	0.02	0.000	-0.02	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	1.507	1.510	1.55	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 2	1.506	1.510	1.54	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.509	1.510	1.55	0.000	1.51	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	345 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241783	MCK131	Korey Devins	10/22/2021	Ozone	000613

Slope:	0.98026	Slope:	0.00000
Intercept	-0.74366	Intercept	0.00000
CorrCoff	0.99998	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180030022	Tfer Desc.	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	Intercept	0.30550
Cert Date	1/20/2021	CorrCoff	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.44	0.13	-0.57	ppb		-0.7
primary	2	14.93	14.56	13.33	ppb		-1.23
primary	3	35.54	35.08	34.00	ppb	-3.13	
primary	4	68.21	67.61	65.23	ppb	-3.58	
primary	5	110.89	110.12	107.30	ppb	-2.59	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	736.8 mmHg	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	ADT <100 vehicles further than 2	Condition	True	Status	pass
Sensor Component	ADT >100 vehicles further than 5	Condition	True	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Moderately clean	Status	pass
Sensor Component	Offset	Condition	-0.1	Status	pass
Sensor Component	Span	Condition	1.003	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	86.9 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	0.8 ppb	Status	pass
Sensor Component	Cell A Flow	Condition	0.68 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	724.1 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	36.6 C	Status	pass
Sensor Component	Cell B Freq.	Condition	95.0 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	0.7 ppb	Status	pass
Sensor Component	Cell B Flow	Condition	0.69 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	725.0 mmHg	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	023293	MCK131	Korey Devins	10/22/2021	Temperature	07002

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00743	**Intercept**	0.21666
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.12	0.20		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.22	0.00	0.000	0.2	C	0.2
primary	Temp Mid Range	25.04	24.64	0.000	24.6	C	-0.09
primary	Temp High Range	46.59	46.03	0.000	46.0	C	-0.07

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	MCK131	Korey Devins	10/22/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.37	0.68		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.85	25.44	0.000	25.2	C	-0.2
primary	Temp Mid Range	24.03	23.64	0.000	24.3	C	0.68
primary	Temp Mid Range	26.41	26.00	0.000	25.8	C	-0.22

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**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	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**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	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	MCK131	Technician	Korey Devins	Site Visit Date	10/22/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	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	Moisture Trap Type	Condition	Glass bottle and filter	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	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	MCK131	Korey Devins	10/22/2021	Moisture Present	Apex	3991	☐	☐

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

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is neat and well organized.

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MCK231-Korey Devins-10/22/2021						
1	10/22/2021	Computer	Dell	07035	Inspiron 15	3C3MC12
2	10/22/2021	DAS	Campbell	000359	CR3000	2137
3	10/22/2021	Elevation	Elevation	None	1	None
4	10/22/2021	Filter pack flow pump	Thomas	04513	107CAB18B	110000014171
5	10/22/2021	Flow Rate	Apex	000892	AXMC105LPMDPCV	illegible
6	10/22/2021	Infrastructure	Infrastructure	none	none	none
7	10/22/2021	Modem	Digi	07176	LR54	unknown
8	10/22/2021	Ozone	ThermoElectron Inc	000695	49i A1NAA	1030244801
9	10/22/2021	Ozone Standard	ThermoElectron Inc	000544	49i A3NAA	0929938242
10	10/22/2021	Shelter Temperature	Campbell	none	107-L	none
11	10/22/2021	Siting Criteria	Siting Criteria	None	1	None
12	10/22/2021	Temperature	RM Young	07003	41342	025496
13	10/22/2021	Zero air pump	Werther International	06924	C 70/4	000836205

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2137	MCK231	Korey Devins	10/22/2021	DAS	Primary

Das Date: 10/22/2021 **Audit Date** 10/22/2021
Das Time: 15:02:45 **Audit Time** 15:02:45
Das Day: 295 **Audit Day** 295

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	2/11/2021	**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	0.4996	V	V	0.0001
7	0.7000	0.6994	0.6995	V	V	0.0001
7	0.9000	0.8993	0.8993	V	V	0.0000
7	1.0000	0.9991	0.9992	V	V	0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	MCK231	Korey Devins	10/22/2021	Flow Rate	000892

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.008
				Cal Factor Full Scale	1
0.44%	0.67%			**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	0.00	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	1.498	1.500	1.50	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.492	1.500	1.50	0.000	1.49	l/m	l/m	-0.67%
primary	test pt 3	1.501	1.510	1.50	0.000	1.50	l/m	l/m	-0.66%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	105 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244801	MCK231	Korey Devins	10/22/2021	Ozone	000695

Slope:	0.99682	**Slope:**	0.00000
Intercept	-0.20351	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.44	0.13	-0.25	ppb		-0.38
primary	2	14.93	14.56	14.38	ppb		-0.18
primary	3	35.54	35.08	35.06	ppb	-0.06	
primary	4	68.21	67.61	66.97	ppb	-0.95	
primary	5	110.89	110.12	109.60	ppb	-0.47	

Sensor Component	Condition	Status
Audit Pressure	736.8 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 2	True	pass
ADT >100 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Moderately clean	pass
Offset	-0.1	pass
Span	1.008	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.0 kHz	pass
Cell A Noise	2.3 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	707.2 mmHg	pass
Cell A Tmp.	33.6 C	pass
Cell B Freq.	97.3 kHz	pass
Cell B Noise	1.6 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	707.8 mmHg	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	025496	MCK231	Korey Devins	10/22/2021	Temperature	07003

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00743	**Intercept**	0.21666
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.22	0.27		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.22	0.00	0.000	0.3	C	0.27
primary	Temp Mid Range	25.04	24.64	0.000	24.4	C	-0.24
primary	Temp High Range	46.59	46.03	0.000	45.9	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	MCK231	Korey Devins	10/22/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.18	0.42		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.71	23.32	0.000	23.3	C	-0.03
primary	Temp Mid Range	23.34	22.95	0.000	23.1	C	0.1
primary	Temp Mid Range	22.54	22.16	0.000	22.6	C	0.42

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**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	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**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	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	MCK231	Technician	Korey Devins	Site Visit Date	10/22/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	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	Moisture Trap Type	Condition	Glass bottle and filter	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	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	MCK231	Korey Devins	10/22/2021	Moisture Present	Apex	4693	☐	☐

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

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The site instruments are located in the MCK131 shelter. The same site operator is servicing both sites.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	MCK131	**Technician**	Korey Devins	**Site Visit Date**	10/22/2021

Site Sponsor (agency)	EPA	**USGS Map**	Mackville
Operating Group	Private	**Map Scale**	
AQS #	21-229-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	37.7044
Deposition Measurement	dry, wet	**QAPP Longitude**	-85.0483
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	353
Terrain	rolling	**QAPP Declination**	4.25
Conforms to MLM	Marginally	**QAPP Declination Date**	12/28/2004
Site Telephone	(859) 262-5181	**Audit Latitude**	37.704678
Site Address 1	Westley Miller Road	**Audit Longitude**	-85.048706
Site Address 2		**Audit Elevation**	293
County	Washington	**Audit Declination**	-4.5
City, State	Harrodsburg, KY		**Present**
Zip Code	40330	**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	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is neat and well organized.				
Site OK	☑	**Notes**					

Driving Directions

From Danville go west on 150 toward Perryville. In Perryville turn right (north) on 1920 or Battlefield Road. Continue approximately 7.3 miles to Wesley Miller Road. Turn left onto Wesley Miller Road and continue approximately 1 mile. The site is on the left through a farm gate.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	MCK131	Technician	Korey Devins	Site Visit Date	10/22/2021

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	MCK131	Technician	Korey Devins	Site Visit Date	10/22/2021

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	MCK131	Technician	Korey Devins	Site Visit Date	10/22/2021

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:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID	MCK131	Technician	Korey Devins	Site Visit Date	10/22/2021

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	MCK131	Technician	Korey Devins	Site Visit Date	10/22/2021

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	☑	Electronic copy	☑
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	MCK131	Technician	Korey Devins	Site Visit Date	10/22/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained on-site by MACTEC technician
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?	☑	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	MCK131	Technician	Korey Devins	Site Visit Date	10/22/2021

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	☑	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 MCK131 **Technician** Korey Devins **Site Visit Date** 10/22/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	7M2MC12	07039
DAS	Campbell	CR3000	2535	000429
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	118700000596	00497
Flow Rate	Apex	AXMC105LPMDPC	illegible	000600
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07177
Ozone	ThermoElectron Inc	49i A1NAA	1009241783	000613
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200027	000453
Sample Tower	Aluma Tower	A	none	03514
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	023293	07002
Zero air pump	Werther International	PC70/4	000829167	06911

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	MCK231	**Technician**	Korey Devins	**Site Visit Date**	10/22/2021

Site Sponsor (agency)	EPA	**USGS Map**	Mackville
Operating Group	Private	**Map Scale**	
AQS #	21-229-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	37.7044
Deposition Measurement	dry, wet	**QAPP Longitude**	-85.0483
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	353
Terrain	rolling	**QAPP Declination**	4.25
Conforms to MLM	Marginally	**QAPP Declination Date**	12/28/2004
Site Telephone	(859) 262-5181	**Audit Latitude**	37.704678
Site Address 1	Wesley Miller Road	**Audit Longitude**	-85.048706
Site Address 2		**Audit Elevation**	293
County	Washington	**Audit Declination**	-4.5
City, State	Harrodsburg, KY		**Present**
Zip Code	40330	**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	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The site instruments are located in the MCK131 shelter. The same site operator is servicing both sites.				
Site OK	☑	**Notes**					

Driving Directions From Danville go west on 150 toward Perryville. In Perryville turn right (north) on 1920 or Battlefield Road. Continue approximately 7.3 miles to Wesley Miller Road. Turn left onto Wesley Miller Road and continue approximately 1 mile. The site is on the left through a farm gate.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	MCK231	Technician	Korey Devins	Site Visit Date	10/22/2021

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 facing 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:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	MCK231	Technician	Korey Devins	Site Visit Date	10/22/2021

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	MCK231	Technician	Korey Devins	Site Visit Date	10/22/2021

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 13 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	MCK231	Technician	Korey Devins	Site Visit Date	10/22/2021

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	MCK231	Technician	Korey Devins	Site Visit Date	10/22/2021

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	☑	Electronic copy	☑
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	MCK231	Technician	Korey Devins	Site Visit Date	10/22/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained on-site by MACTEC technician
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?	☑	
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	MCK231	Technician	Korey Devins	Site Visit Date	10/22/2021

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	☑	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 MCK231 **Technician** Korey Devins **Site Visit Date** 10/22/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	3C3MC12	07035
DAS	Campbell	CR3000	2137	000359
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	110000014171	04513
Flow Rate	Apex	AXMC105LPMDPC	illegible	000892
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07176
Ozone	ThermoElectron Inc	49i A1NAA	1030244801	000695
Ozone Standard	ThermoElectron Inc	49i A3NAA	0929938242	000544
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	025496	07003
Zero air pump	Werther International	C 70/4	000836205	06924

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ABT147-Korey Devins-10/24/2021						
1	10/24/2021	DAS	Campbell	000413	CR3000	2519
2	10/24/2021	Ozone	ThermoElectron Inc	000627	49i A1NAA	1009241772
3	10/24/2021	Ozone Standard	ThermoElectron Inc	000747	49i A3NAA	1105347330
4	10/24/2021	Zero air pump	Werther International	06930	P 70/4	000829168

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241772	ABT147	Korey Devins	10/24/2021	Ozone	000627

Slope:	0.99979	**Slope:**	0.00000
Intercept	-0.04868	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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	0.55	0.24	0.27	ppb		0.03
primary	2	15.33	14.96	14.85	ppb		-0.11
primary	3	34.60	34.15	34.04	ppb	-0.32	
primary	4	66.82	66.23	66.19	ppb	-0.06	
primary	5	109.03	108.26	108.20	ppb	-0.06	

Sensor Component	Condition	Status
Audit Pressure	746.5 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	True	pass
ADT >100 vehicles further than 50	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.1	pass
Span	1.008	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	97.9 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	720.1 mmHg	pass
Cell A Tmp.	33.6 C	pass
Cell B Freq.	100.4 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	720.7 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
LAV410-Martin Valvur-11/04/2021						
1	11/4/2021	Computer	Hewlett Packard	none	ProBook	Unknown
2	11/4/2021	DAS	Environmental Sys Corp	90535	8816	2026
3	11/4/2021	Elevation	Elevation	None	1	None
4	11/4/2021	Filter pack flow pump	Thomas	none	107CA18B	081700057768
5	11/4/2021	flow rate	Tylan	none	FC280SAV	AW02213004
6	11/4/2021	Infrastructure	Infrastructure	none	none	none
7	11/4/2021	Met tower	Rohn	none	unknown	none
8	11/4/2021	MFC power supply	Tylan	00042	RO-32	FP902022
9	11/4/2021	Modem	US Robotics	none	56k	unknown
10	11/4/2021	Ozone	ThermoElectron Inc	90834	49C	49C-520012-328
11	11/4/2021	Ozone Standard	ThermoElectron Inc	90567	49C	49C-59283-322
12	11/4/2021	Sample Tower	Aluma Tower	923314	B	AT-5324-F6-O
13	11/4/2021	Shelter Temperature	ARS	none	unknown	none
14	11/4/2021	Siting Criteria	Siting Criteria	None	1	None
15	11/4/2021	Temperature2meter	RM Young	none	41342VC	029458
16	11/4/2021	Zero air pump	Twin Tower Engineering	none	TT70/4E	526292

DAS Data Form

DAS Time Max Error: 1.2

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2026	LAV410	Martin Valvur	11/04/2021	DAS	Primary

Das Date: 11/4 /2021
Das Time: 09:02:48
Das Day: 308

Audit Date 11/4 /2021
Audit Time 09:04:00
Audit Day 308

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0004	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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
9	0.0000	-0.0004	-0.0003	V	V	0.0001
9	0.1000	0.1003	0.1002	V	V	-0.0001
9	0.3000	0.2998	0.2995	V	V	-0.0003
9	0.5000	0.4997	0.4996	V	V	-0.0001
9	0.7000	0.6999	0.7000	V	V	0.0001
9	0.9000	0.9000	0.8996	V	V	-0.0004
9	1.0000	0.9996	0.9995	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW02213004	LAV410	Martin Valvur	11/04/2021	flow rate	none

Mfg	Tylan	
SN/Owner ID	FP902022	00042
Parameter:	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00850	**Intercept**	0.00160
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	
4.93%	5.16%			

Cal Factor Zero	0.474
Cal Factor Full Scale	10.57
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	-0.27	0.0000	0.25	l/m	l/m	
primary	leak check	0.000	0.000	-0.26	0.0000	0.25	l/m	l/m	
primary	test pt 1	2.512	2.490	2.10	0.0000	2.61	l/m	l/m	4.74%
primary	test pt 2	2.500	2.480	2.10	0.0000	2.60	l/m	l/m	4.88%
primary	test pt 3	2.506	2.480	2.10	0.0000	2.61	l/m	l/m	5.16%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	25 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-520012-328	LAV410	Martin Valvur	11/04/2021	Ozone	90834

Slope:	1.01500	**Slope:**	0.00000
Intercept	-0.86732	**Intercept**	0.00000
CorrCoff:	0.99991	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00340	**Intercept**	0.02230
Cert Date	1/20/2021	**CorrCoff**	1.00000

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	-0.11	-0.14	ppb		-0.03
primary	2	14.71	14.64	13.48	ppb		-1.16
primary	3	36.77	36.63	35.92	ppb	-1.96	
primary	4	66.45	66.22	66.00	ppb	-0.33	
primary	5	109.49	109.12	110.30	ppb	1.08	

Sensor Component	Condition	Status
Audit Pressure	622 mmHg	pass
26.6 degree unobstructed rule	False	Fail
Tree dewline >10m or below inlet	False	Fail
ADT <100 vehicles further than 20	90 m	Fail
ADT >100 vehicles further than 50	09 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	0.000	pass
Span	1.038	pass
Zero Voltage	0.0003	pass
Fullscale Voltage	1.0000	pass
Cell A Freq.	75.3 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	601.1 mmHg	pass
Cell A Tmp.	42.8 C	Fail
Cell B Freq.	86.2 kHz	pass
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.62 lpm	pass
Cell B Pressure	600.7 mmHg	pass
System Memo	See comments	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	029458	LAV410	Martin Valvur	11/04/2021	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.61	0.71		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	-0.01	0.00	0.0000	0.52	C	0.52
primary	Temp Mid Range	24.48	24.49	0.0000	25.08	C	0.59
primary	Temp High Rang	47.01	47.03	0.0000	47.74	C	0.71

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	LAV410	Martin Valvur	11/04/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.22	1.50		

Mfg	Fluke	Parameter	Shelter Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99975	Intercept	-0.00824
Cert Date	2/9/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.96	24.97	0.000	24.0	C	-0.94
primary	Temp Mid Range	25.81	25.82	0.000	24.3	C	-1.5
primary	Temp Mid Range	25.90	25.91	0.000	24.7	C	-1.22

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	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	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	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	25 m	Status	Fail
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass

Infrastructure Data For

Site ID	LAV410	Technician	Martin Valvur	Site Visit Date	11/04/2021

Shelter Make	Shelter Model	Shelter Size
		1150 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	Moisture Trap Type	Condition	Glass bottle and filter	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	LAV410	Martin Valvur	11/04/2021	Accuracy	Tylan	1862	☐	☐
The recorded flow rate data are accurate as recorded. The flow rate is not at the target flow rate.								
Ozone	LAV410	Martin Valvur	11/04/2021	Cell A Tmp.	ThermoElectron	1344	☐	☐
This analyzer diagnostic check is outside the manufacturer's recommended value.								

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone inlet filter is changed and the sample line conditioned every two weeks or as needed.

2 **Parameter:** SitingCriteriaCom

The site is located at the end of a park service facility parking lot, in a fire station. The tree line is near the building, but the prevailing wind direction is from the clearing. Tree height above the sample inlet is not twice as far away as it is high above the inlet.

3 **Parameter:** ShelterCleanNotes

The inside equipment is located in room within the fire station, clean, neat, and organized.

4 **Parameter:** PollAnalyzerCom

Trees violate the ozone sample inlet siting criteria.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	LAV410	Technician	Martin Valvur	Site Visit Date	11/04/2021

Site Sponsor (agency)	NPS	USGS Map	Manzanita Lake
Operating Group	NPS	Map Scale	
AQS #	06-065-1004	Map Date	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	QAPP Latitude	40.5403
Deposition Measurement	dry, wet	QAPP Longitude	-121.5764
Land Use	woodland - evergreen	QAPP Elevation Meters	1756
Terrain	complex	QAPP Declination	
Conforms to MLM	Marginally	QAPP Declination Date	
Site Telephone	(530) 335-7214	Audit Latitude	40.539991
Site Address 1	38050 Hwy 36E	Audit Longitude	-121.576462
Site Address 2		Audit Elevation	1755
County	Shasta	Audit Declination	14.5
City, State	Mineral, CA		
Zip Code	96063	Present Fire Extinguisher ☑	Inspected August 2021
Time Zone	Pacific	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	1150 cuft
Shelter Clean	☑	Notes	The inside equipment is located in room within the fire station, clean, neat, and organized.				
Site OK	☑	Notes					

Driving Directions

From Redding take route 44 east for approximately 45 miles. At the park, and intersection of 44 and 89, turn right onto route 89. Turn right at the first road into the fire station and maintenance area. Take the first left, the site is behind the fire station at the end of the parking lot. One room in the fire station houses the climate controlled equipment.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	LAV410	Technician	Martin Valvur	Site Visit Date	11/04/2021

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	LAV410	Technician	Martin Valvur	Site Visit Date	11/04/2021

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	LAV410	Technician	Martin Valvur	Site Visit Date	11/04/2021

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?	☐	< 10 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 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:

Trees violate the ozone sample inlet siting criteria.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID LAV410 **Technician** Martin Valvur **Site Visit Date** 11/04/2021

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	LAV410	Technician	Martin Valvur	Site Visit Date	11/04/2021

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	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑	July 2012	☑
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	LAV410	Technician	Martin Valvur	Site Visit Date	11/04/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Informal training provided by ARS during maintenance visits
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	☑	Not performed	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	Not performed	☑
Analyzer Diagnostics Tests	☑	Alarm values only	☑
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	☐		☐

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	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 ozone inlet filter is changed and the sample line conditioned every two weeks or as needed.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	LAV410	Technician	Martin Valvur	Site Visit Date	11/04/2021

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed between 11:00 and 13:00
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, 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	☑	Weekly	☑
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 LAV410 **Technician** Martin Valvur **Site Visit Date** 11/04/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	Unknown	none
DAS	Environmental Sys Corp	8816	2026	90535
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18B	081700057768	none
flow rate	Tylan	FC280SAV	AW02213004	none
Infrastructure	Infrastructure	none	none	none
Met tower	Rohn	unknown	none	none
MFC power supply	Tylan	RO-32	FP902022	00042
Modem	US Robotics	56k	unknown	none
Ozone	ThermoElectron Inc	49C	49C-520012-328	90834
Ozone Standard	ThermoElectron Inc	49C	49C-59283-322	90567
Sample Tower	Aluma Tower	B	AT-5324-F6-O	923314
Shelter Temperature	ARS	unknown	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	029458	none
Zero air pump	Twin Tower Engineering	TT70/4E	526292	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PED108-Korey Devins-11/10/2021						
1	11/10/2021	Computer	Dell	07051	Inspiron 15	Unknown
2	11/10/2021	DAS	Campbell	000406	CR3000	2511
3	11/10/2021	Elevation	Elevation	None	1	None
4	11/10/2021	Filter pack flow pump	Thomas	00564	107CA18	1088003022
5	11/10/2021	Flow Rate	Apex	000527	AXMC105LPMDPCV	48100
6	11/10/2021	Infrastructure	Infrastructure	none	none	none
7	11/10/2021	Modem	Digi	07203	LR54	unknown
8	11/10/2021	Ozone	ThermoElectron Inc	000732	49i A1NAA	1105347319
9	11/10/2021	Ozone Standard	ThermoElectron Inc	000214	49i A3NAA	0622717855
10	11/10/2021	Sample Tower	Aluma Tower	000788	B	unknown
11	11/10/2021	Shelter Temperature	Campbell	none	107-L	none
12	11/10/2021	Siting Criteria	Siting Criteria	None	1	None
13	11/10/2021	Temperature	RM Young	06408	41342	14041
14	11/10/2021	Zero air pump	Werther International	06883	C 70/4	000815257

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2511	PED108	Korey Devins	11/10/2021	DAS	Primary

Das Date: 11/10/2021 **Audit Date** 11/10/2021
Das Time: 10:53:29 **Audit Time** 10:53:30
Das Day: 314 **Audit Day** 314

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

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000
Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/11/2021	**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	0.0998	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	0.6994	0.6993	V	V	-0.0001
7	0.9000	0.8992	0.8991	V	V	-0.0001
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	48100	PED108	Korey Devins	11/10/2021	Flow Rate	000527

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
				Cal Factor Full Scale	1.01
0.45%	1.35%			**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	-0.02	l/m	l/m	
primary	test pt 1	1.481	1.490	1.49	0.000	1.49	l/m	l/m	0.00%
primary	test pt 2	1.481	1.480	1.49	0.000	1.50	l/m	l/m	1.35%
primary	test pt 3	1.481	1.490	1.49	0.000	1.49	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	120 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	1105347319	PED108	Korey Devins	11/10/2021	Ozone	000732

Slope:	1.00697	**Slope:**	0.00000
Intercept	-0.05882	**Intercept**	0.00000
CorrCoff:	0.99999	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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	0.15	0.26	ppb		0.11
primary	2	15.91	15.53	15.60	ppb		0.07
primary	3	36.23	35.77	35.74	ppb	-0.08	
primary	4	68.72	68.12	68.45	ppb	0.48	
primary	5	114.24	113.45	114.30	ppb	0.75	

Sensor Component	Audit Pressure	**Condition**	752.2 mmHg	**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	ADT <100 vehicles further than 20	**Condition**	125 m	**Status**	Fail
Sensor Component	ADT >100 vehicles further than 50	**Condition**	True	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Offset	**Condition**	-0.1	**Status**	pass
Sensor Component	Span	**Condition**	1.031	**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**	92.1 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.7 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.62 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	714.2 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	33.9 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	111.2 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.55 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	715.1 mmHg	**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	14041	PED108	Korey Devins	11/10/2021	Temperature	06408

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00743	**Intercept**	0.21666
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.13	0.26		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.13	-0.09	0.000	0.2	C	0.26
primary	Temp Mid Range	25.06	24.66	0.000	24.7	C	0.02
primary	Temp High Range	46.45	45.89	0.000	45.8	C	-0.11

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	PED108	Korey Devins	11/10/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.46	0.86		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.42	25.02	0.000	25.9	C	0.86
primary	Temp Mid Range	25.75	25.35	0.000	25.8	C	0.41
primary	Temp Mid Range	26.50	26.09	0.000	26.2	C	0.12

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	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	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition	125 m	Status	Fail
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	Large parking lot	Condition		Status	pass

Infrastructure Data For

Site ID	PED108	Technician	Korey Devins	Site Visit Date	11/10/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-13)	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	Moisture Trap Type	Condition	Glass bottle and filter	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	Good	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
Sensor Component	System Memo	Condition		Status	pass

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is in a clearing in an evergreen plantation in the Prince Edward-Gallion State Forest. Trees were cut within the last 11 years to increase the size of the clearing. The tree line is encroaching again and is between 25 and 35 meters from the site.

2 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PED108	**Technician**	Korey Devins	**Site Visit Date**	11/10/2021

Site Sponsor (agency)	EPA	**USGS Map**	Green Bay
Operating Group	Private	**Map Scale**	
AQS #	51-147-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	37.1653
Deposition Measurement	dry, wet	**QAPP Longitude**	-78.3070
Land Use	woodland - mixed	**QAPP Elevation Meters**	150
Terrain	rolling	**QAPP Declination**	-9.1
Conforms to MLM	Yes	**QAPP Declination Date**	2/22/2006
Site Telephone		**Audit Latitude**	37.165222
Site Address 1	SR 629	**Audit Longitude**	-78.307067
Site Address 2	Prince Edward-Gallion State Forest	**Audit Elevation**	149
County	Prince Edward	**Audit Declination**	-9.4
City, State	Burkesville, VA		
Zip Code	23922	**Fire Extinguisher** ☑	No inspection date
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 2116-13)	**Shelter Size**	640 cuft
Shelter Clean ☑	**Notes**	The shelter is in fair condition, clean, neat, and well organized.				
Site OK ☑	**Notes**					

Driving Directions From Farmville travel east on 460 approximately 1 mile. Turn right (south) onto route 696 toward Twin Lakes State Park. Continue approximately 8.5 miles on 696 (do not turn at the next sign for Twin Lakes State Park near the church) into the state forest. Turn left onto route 629 and continue approximately 1.3 miles. The site is not visible from the road, and is through a gate on a gravel road to the right.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PED108	Technician	Korey Devins	Site Visit Date	11/10/2021

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	PED108	Technician	Korey Devins	Site Visit Date	11/10/2021

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	PED108	Technician	Korey Devins	Site Visit Date	11/10/2021

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 18 meters
4	Describe dry dep sample tube.		3/8 teflon by 18 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	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	PED108	Technician	Korey Devins	Site Visit Date	11/10/2021

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	PED108	Technician	Korey Devins	Site Visit Date	11/10/2021

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	☑	July 2016	☐
HASP	☑	July 2016	☐
Field Ops Manual	☑	July 2016	☐
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	PED108	Technician	Korey Devins	Site Visit Date	11/10/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained in FL in 1987 and refresher course in July 2006
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	☑	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	☐		☐
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	PED108	Technician	Korey Devins	Site Visit Date	11/10/2021

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	FIter 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	☐	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:

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID PED108 **Technician** Korey Devins **Site Visit Date** 11/10/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07051
DAS	Campbell	CR3000	2511	000406
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	1088003022	00564
Flow Rate	Apex	AXMC105LPMDPC	48100	000527
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07203
Ozone	ThermoElectron Inc	49i A1NAA	1105347319	000732
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717855	000214
Sample Tower	Aluma Tower	B	unknown	000788
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14041	06408
Zero air pump	Werther International	C 70/4	000815257	06883

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CDR119-Korey Devins-11/11/2021						
1	11/11/2021	Computer	Dell	07071	Inspiron 15	Unknown
2	11/11/2021	DAS	Campbell	000633	CR3000	4935
3	11/11/2021	Elevation	Elevation	None	1	None
4	11/11/2021	Filter pack flow pump	Thomas	06027	107CAB18	060400022672
5	11/11/2021	Flow Rate	Apex	illegible	AXMC105LPMDPCV	illegible
6	11/11/2021	Infrastructure	Infrastructure	none	none	none
7	11/11/2021	Modem	Digi	07191	LR54	unknown
8	11/11/2021	Ozone	ThermoElectron Inc	000705	49i A1NAA	1030244807
9	11/11/2021	Ozone Standard	ThermoElectron Inc	000199	49i A3NAA	0607315737
10	11/11/2021	Sample Tower	Aluma Tower	928376	B	AT-51060-56
11	11/11/2021	Shelter Temperature	Campbell	none	107-L	none
12	11/11/2021	Siting Criteria	Siting Criteria	None	1	None
13	11/11/2021	Temperature	RM Young	04448	41342	4546
14	11/11/2021	Zero air pump	Werther International	06935	C 70/4	000829172

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	4935	CDR119	Korey Devins	11/11/2021	DAS	Primary

Das Date:	11/11/2021	**Audit Date**	11/11/2021
Das Time:	12:47:00	**Audit Time**	12:47:00
Das Day:	315	**Audit Day**	315

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2996	0.2997	V	V	0.0001
7	0.5000	0.4995	0.4996	V	V	0.0001
7	0.7000	0.6994	0.6996	V	V	0.0002
7	0.9000	0.8993	0.8994	V	V	0.0001
7	1.0000	0.9991	0.9993	V	V	0.0002

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CDR119	Korey Devins	11/11/2021	Flow Rate	illegible

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.015
1.32%	1.32%			**Cal Factor Full Scale**	0.972
				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	1.515	1.520	1.54	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.512	1.520	1.54	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.512	1.520	1.54	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**	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**	200 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	1030244807	CDR119	Korey Devins	11/11/2021	Ozone	000705

Slope:	0.97934	**Slope:**	0.00000
Intercept	0.12191	**Intercept**	0.00000
CorrCoff:	0.99998	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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	0.34	0.03	0.54	ppb		0.51
primary	2	15.96	15.58	15.14	ppb		-0.44
primary	3	35.83	35.37	34.54	ppb	-2.37	
primary	4	68.56	67.96	66.60	ppb	-2.02	
primary	5	112.72	111.94	109.90	ppb	-1.84	

Sensor Component	Condition	Status
Audit Pressure	738.1 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	31 m	Fail
ADT >100 vehicles further than 50	31 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.1	pass
Span	1.005	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	92.8 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.48 lpm	pass
Cell A Pressure	718.8 mmHg	pass
Cell A Tmp.	36.2 C	pass
Cell B Freq.	97.8 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.50 lpm	pass
Cell B Pressure	719.4 mmHg	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4546	CDR119	Korey Devins	11/11/2021	Temperature	04448

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00743	**Intercept**	0.21666
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.25	0.33		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.30	0.08	0.000	0.4	C	0.33
primary	Temp Mid Range	27.01	26.60	0.000	26.5	C	-0.12
primary	Temp High Range	46.37	45.81	0.000	45.5	C	-0.29

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	CDR119	Korey Devins	11/11/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.26	0.36		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.55	27.13	0.000	27.3	C	0.19
primary	Temp Mid Range	27.30	26.88	0.000	27.2	C	0.36
primary	Temp Mid Range	28.23	27.81	0.000	28.0	C	0.22

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**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	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**Condition**		**Status**	pass
Sensor Component	Major industrial source	**Condition**		**Status**	pass
Sensor Component	Secondary road < or = 100 per da	**Condition**	30 m	**Status**	Fail
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	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
CDR119	Korey Devins	11/11/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	N/A	pass
Met Tower	N/A	pass
Moisture Trap	Installed	pass
Moisture Trap Type	Glass bottle and filter	pass
Power Cables	Good	pass
Shelter Temp Control	Functioning	pass
Rotometer	Installed	pass
Sample Tower	Good	pass
Shelter Condition	Fair	pass
Shelter Door	Good	pass
Shelter Roof	Good	pass
Shelter Floor	Fair	pass
Shelter walls	Poor	Fail
Excessive mold present	Fair	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	CDR119	Korey Devins	11/11/2021	Moisture Present	Apex	4697	☐	☐

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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

Site is in a wooded valley, within 30 meters of a lightly traveled road. Large diesel trucks use the road. Trees are taller than the sample tower and within 20 meters of the sample tower.

2 **Parameter:** ShelterCleanNotes

The shelter is in fair condition with some rot on the walls below the air conditioner.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CDR119	**Technician**	Korey Devins	**Site Visit Date**	11/11/2021

Site Sponsor (agency)	EPA	**USGS Map**	Glenville
Operating Group	private, WV parks dept	**Map Scale**	
AQS #	54-021-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	38.879503
Site Address 1	Cedar Creek St. Park	**Audit Longitude**	-80.847677
Site Address 2		**Audit Elevation**	240
County	Gilmer	**Audit Declination**	-8
City, State	Glenville, WV		
Zip Code	26351	**Fire Extinguisher** ☑	Inspected Oct 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	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition with some rot on the walls below the air conditioner.				
Site OK	☑	**Notes**					
Driving Directions							

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CDR119	Technician	Korey Devins	Site Visit Date	11/11/2021

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	CDR119	Technician	Korey Devins	Site Visit Date	11/11/2021

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	CDR119	Technician	Korey Devins	Site Visit Date	11/11/2021

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?	☑	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	CDR119	Technician	Korey Devins	Site Visit Date	11/11/2021

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?	☑	Temperature 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	CDR119	Technician	Korey Devins	Site Visit Date	11/11/2021

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	CDR119	Technician	Korey Devins	Site Visit Date	11/11/2021

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	☐		☑
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	CDR119	Technician	Korey Devins	Site Visit Date	11/11/2021

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, 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 CDR119 **Technician** Korey Devins **Site Visit Date** 11/11/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07071
DAS	Campbell	CR3000	4935	000633
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060400022672	06027
Flow Rate	Apex	AXMC105LPMDPC	illegible	illegible
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07191
Ozone	ThermoElectron Inc	49i A1NAA	1030244807	000705
Ozone Standard	ThermoElectron Inc	49i A3NAA	0607315737	000199
Sample Tower	Aluma Tower	B	AT-51060-56	928376
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4546	04448
Zero air pump	Werther International	C 70/4	000829172	06935

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PAR107-Korey Devins-11/12/2021						
1	11/12/2021	Computer	Dell	07072	Inspiron 15	Unknown
2	11/12/2021	DAS	Campbell	000333	CR3000	2112
3	11/12/2021	Elevation	Elevation	None	1	None
4	11/12/2021	Filter pack flow pump	Thomas	00859	107CA18	missing
5	11/12/2021	Flow Rate	Apex	000596	AXMC105LPMDPCV	illegible
6	11/12/2021	Infrastructure	Infrastructure	none	none	none
7	11/12/2021	Modem	Digi	07160	LR54	unknown
8	11/12/2021	Ozone	ThermoElectron Inc	000624	49i A1NAA	1009241792
9	11/12/2021	Ozone Standard	ThermoElectron Inc	000436	49i A3NAA	CM08200012
10	11/12/2021	Sample Tower	Aluma Tower	000838	B	unknown
11	11/12/2021	Shelter Temperature	Campbell	none	107-L	none
12	11/12/2021	Siting Criteria	Siting Criteria	None	1	None
13	11/12/2021	Temperature	RM Young	04316	41342VO	4013
14	11/12/2021	Zero air pump	Werther International	07291	C 120/TC	001071024

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2112	PAR107	Korey Devins	11/12/2021	DAS	Primary

Das Date: 11/12/2021
Das Time: 11:51:30
Das Day: 316

Audit Date 11/12/2021
Audit Time 11:51:30
Audit Day 316

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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2996	0.2997	V	V	0.0001
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6994	0.6994	V	V	0.0000
7	0.9000	0.8993	0.8992	V	V	-0.0001
7	1.0000	0.9992	0.9992	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	PAR107	Korey Devins	11/12/2021	Flow Rate	000596

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	0.99756	**Intercept**	-0.00058
Cert Date	2/10/2021	**CorrCoff**	0.99993

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0.003
				Cal Factor Full Scale	0.995
0.66%	0.66%			**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	0.00	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	1.505	1.510	1.50	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 2	1.504	1.510	1.50	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.504	1.510	1.50	0.000	1.50	l/m	l/m	-0.66%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	120 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	1009241792	PAR107	Korey Devins	11/12/2021	Ozone	000624

Slope:	0.98329	**Slope:**	0.00000
Intercept	-0.46557	**Intercept**	0.00000
CorrCoff:	0.99996	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00030	**Intercept**	0.30550
Cert Date	1/20/2021	**CorrCoff**	1.00000

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	0.43	0.12	-0.21	ppb		-0.33
primary	2	15.62	15.25	14.37	ppb		-0.88
primary	3	34.45	34.00	33.31	ppb	-2.05	
primary	4	66.16	65.57	63.41	ppb	-3.35	
primary	5	109.12	108.35	106.35	ppb	-1.86	

Sensor Component	Condition	Status
Audit Pressure	716 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	125 m	Fail
ADT >100 vehicles further than 50	363 m	Fail
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.1	pass
Span	1.006	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	Pass
Cell A Freq.	102.3 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	684.6 mmHg	pass
Cell A Tmp.	32.7 C	pass
Cell B Freq.	103.9 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	685.2 mmHg	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4013	PAR107	Korey Devins	11/12/2021	Temperature	04316

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00743	**Intercept**	0.21666
Cert Date	2/18/2021	**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	0.15	-0.07	0.000	0.0	C	0.09
primary	Temp Mid Range	26.70	26.29	0.000	26.2	C	-0.1
primary	Temp High Range	47.26	46.70	0.000	46.8	C	0.06

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	PAR107	Korey Devins	11/12/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.46	0.86		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00743	Intercept	0.21666
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	20.02	19.66	0.000	20.5	C	0.86
primary	Temp Mid Range	21.26	20.89	0.000	21.0	C	0.1
primary	Temp Mid Range	24.30	23.91	0.000	24.3	C	0.41

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	City > 50,000	Condition		Status	pass
Sensor Component	City 1,000 to 10,000	Condition	2.5 km	Status	Fail
Sensor Component	City 10,000 to 50,000	Condition		Status	pass
Sensor Component	Feedlot operations	Condition		Status	pass
Sensor Component	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	Condition		Status	pass
Sensor Component	Major industrial source	Condition		Status	pass
Sensor Component	Secondary road < or = 100 per da	Condition	125 m	Status	Fail
Sensor Component	Secondary road >100 vehicles/da	Condition	363 m	Status	Fail
Sensor Component	Small parking lot	Condition		Status	pass
Sensor Component	System Memo	Condition		Status	pass
Sensor Component	Large parking lot	Condition		Status	pass

Infrastructure Data For

Site ID	PAR107	Technician	Korey Devins	Site Visit Date	11/12/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Glass bottle and filter	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	PAR107	Korey Devins	11/12/2021	Moisture Present	Apex	4010	☐	☐

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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The city of Parsons, estimated population 1500, is within 5 km of the site.

2 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PAR107	**Technician**	Korey Devins	**Site Visit Date**	11/12/2021

Site Sponsor (agency)	EPA/USFS	**USGS Map**	Parsons
Operating Group	USFS	**Map Scale**	
AQS #	54-093-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	39.090434
Site Address 1	USFS Timber & Watershed Lab	**Audit Longitude**	-79.661742
Site Address 2	Rt. 219, Nursery Bottom	**Audit Elevation**	510
County	Parsons	**Audit Declination**	-9
City, State	Parsons, WV		
Zip Code	26287	**Fire Extinguisher** ☑	Inspected July 2018
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	**Shelter Size**	640 cuft
Shelter Clean ☑	**Notes**	The shelter is in good condition, clean, neat, and well organized.				
Site OK ☑	**Notes**					

Driving Directions Take highway 33W to Elkins WV. Turn onto 19N to Parsons. Continue through town to the Nursery Bottom Reservoir. The site entrance is on the right next to the visitors center.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PAR107	Technician	Korey Devins	Site Visit Date	11/12/2021

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	PAR107	Technician	Korey Devins	Site Visit Date	11/12/2021

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	PAR107	Technician	Korey Devins	Site Visit Date	11/12/2021

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	PAR107	Technician	Korey Devins	Site Visit Date	11/12/2021

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	PAR107	Technician	Korey Devins	Site Visit Date	11/12/2021

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?	☑	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	PAR107	Technician	Korey Devins	Site Visit Date	11/12/2021

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	PAR107	Technician	Korey Devins	Site Visit Date	11/12/2021

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings 90%
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	☐		☐

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 PAR107 **Technician** Korey Devins **Site Visit Date** 11/12/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07072
DAS	Campbell	CR3000	2112	000333
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	missing	00859
Flow Rate	Apex	AXMC105LPMDPC	illegible	000596
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07160
Ozone	ThermoElectron Inc	49i A1NAA	1009241792	000624
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200012	000436
Sample Tower	Aluma Tower	B	unknown	000838
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	4013	04316
Zero air pump	Werther International	C 120/TC	001071024	07291

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MKG113-Eric Hebert-11/29/2021						
1	11/29/2021	DAS	Campbell	000404	CR3000	2521
2	11/29/2021	Ozone	ThermoElectron Inc	000702	49i A1NAA	1030244799
3	11/29/2021	Ozone Standard	ThermoElectron Inc	000370	49i A3NAA	0726124689
4	11/29/2021	Zero air pump	Werther International	06899	C 70/4	000821902

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244799	MKG113	Eric Hebert	11/29/2021	Ozone	000702

Slope:	1.01421	**Slope:**	0.00000
Intercept	0.19975	**Intercept**	0.00000
CorrCoff:	1.00000	**CorrCoff:**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00560	**Intercept**	0.14070
Cert Date	4/7/2021	**CorrCoff**	0.99990

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	0.18	0.47	ppb		0.29
primary	2	17.52	17.05	17.54	ppb		0.49
primary	3	36.64	35.82	36.44	ppb	1.72	
primary	4	67.41	66.02	66.98	ppb	1.44	
primary	5	109.81	107.64	109.50	ppb	1.71	

Sensor Component	Condition	Status
Audit Pressure	725.3 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 20	112 m	Fail
ADT >100 vehicles further than 50	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.10	pass
Span	1.013	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	93.2 kHz	pass
Cell A Noise	1.5 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	691.3 mmHg	pass
Cell A Tmp.	34.6 C	pass
Cell B Freq.	90.2 kHz	pass
Cell B Noise	1.3 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	691.9 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
QAK172-Eric Hebert-11/30/2021						
1	11/30/2021	Computer	Dell	07066	Inspiron 15	Unknown
2	11/30/2021	DAS	Campbell	000410	CR3000	2508
3	11/30/2021	Elevation	Elevation	None	1	None
4	11/30/2021	Filter pack flow pump	Thomas	02357	107CAB18	1089005314
5	11/30/2021	Flow Rate	Apex	000888	AXMC105LPMDPCV	illegible
6	11/30/2021	Infrastructure	Infrastructure	none	none	none
7	11/30/2021	Modem	Digi	07139	LR54	unknown
8	11/30/2021	Ozone	ThermoElectron Inc	000676	49i A1NAA	1030244794
9	11/30/2021	Ozone Standard	ThermoElectron Inc	000367	49i A3NAA	0726124683
10	11/30/2021	Sample Tower	Aluma Tower	666368	B	AT-5107-E-4-8
11	11/30/2021	Shelter Temperature	Campbell	none	107-L	none
12	11/30/2021	Siting Criteria	Siting Criteria	None	1	None
13	11/30/2021	Temperature	RM Young	06308	41342VO	12533
14	11/30/2021	Zero air pump	Werther International	06870	PC70/4	000814278

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2508	QAK172	Eric Hebert	11/30/2021	DAS	Primary

Das Date: 11/30/2021 **Audit Date** 11/30/2021
Das Time: 10:12:59 **Audit Time** 10:13:00
Das Day: 334 **Audit Day** 334

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

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000
Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/11/2021	**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	0.1165	0.1165	V	V	0.0000
7	0.3000	0.3504	0.3502	V	V	-0.0002
7	0.5000	0.5005	0.5005	V	V	0.0000
7	0.7000	0.7002	0.7001	V	V	-0.0001
7	0.9000	0.9003	0.9002	V	V	-0.0001
7	1.0000	1.0004	1.0003	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	QAK172	Eric Hebert	11/30/2021	Flow Rate	000888

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 530-H
Tfer ID	01414		
Slope	1.00185	**Intercept**	0.02453
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	0
2.74%	2.74%			**Cal Factor Full Scale**	0
				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	0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.08	0.000	0.09	l/m	l/m	
primary	test pt 1	1.483	1.460	1.49	0.000	1.50	l/m	l/m	2.74%
primary	test pt 2	1.488	1.460	1.49	0.000	1.50	l/m	l/m	2.74%
primary	test pt 3	1.492	1.460	1.49	0.000	1.50	l/m	l/m	2.74%

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**	5.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244794	QAK172	Eric Hebert	11/30/2021	Ozone	000676

Slope:	1.03475	Slope:	0.00000
Intercept	-0.39443	Intercept	0.00000
CorrCoff	1.00000	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180930075	Tfer Desc.	Ozone primary stan
Tfer ID	01115		
Slope	1.00560	Intercept	0.14070
Cert Date	4/7/2021	CorrCoff	0.99990

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.81	0.65	0.38	ppb		-0.27
primary	2	17.23	16.77	16.84	ppb		0.07
primary	3	37.41	36.57	37.41	ppb	2.27	
primary	4	68.32	66.91	68.90	ppb	2.93	
primary	5	111.02	108.82	112.20	ppb	3.06	

Sensor Component	Condition	Status
Audit Pressure	710.1 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 2	True	pass
ADT >100 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Moderately clean	pass
Offset	0.000	pass
Span	1.029	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	91.5 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	684.0 mmHg	pass
Cell A Tmp.	32.6 C	pass
Cell B Freq.	98.2 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	684.6 mmHg	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12533	QAK172	Eric Hebert	11/30/2021	Temperature	06308

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00751	**Intercept**	0.16174
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.22	0.25		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.14	-0.02	0.000	-0.3	C	-0.25
primary	Temp Mid Range	27.58	27.21	0.000	27.1	C	-0.16
primary	Temp High Range	46.00	45.50	0.000	45.3	C	-0.25

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	QAK172	Eric Hebert	11/30/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.70	0.95		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00751	Intercept	0.16174
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.33	23.99	0.000	24.5	C	0.46
primary	Temp Mid Range	23.63	23.29	0.000	24.2	C	0.95

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**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	Intensive agriculture operations	**Condition**		**Status**	pass
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**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	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
QAK172	Eric Hebert	11/30/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2625-2)	640 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	N/A	pass
Met Tower	N/A	pass
Moisture Trap	Installed	pass
Moisture Trap Type	Glass bottle and filter	pass
Power Cables	Good	pass
Shelter Temp Control	Functioning	pass
Rotometer	Installed	pass
Sample Tower	Good	pass
Shelter Condition	Fair	pass
Shelter Door	Fair	pass
Shelter Roof	Fair	pass
Shelter Floor	Fair	pass
Shelter walls	Fair	pass
Excessive mold present	Good	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is doing an excellent job maintaining the site. The bag that the filter is shipped in is not present at the site. If the site operator is taking the bag to another location it is possible that it could be exposed to unknown contamination.

2 **Parameter:** ShelterCleanNotes

The shelter is in fair condition with some loose floor tiles.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	QAK172	**Technician**	Eric Hebert	**Site Visit Date**	11/30/2021

Site Sponsor (agency)	EPA	**USGS Map**	Quaker City
Operating Group	Private	**Map Scale**	
AQS #	39-121-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	39.9431
Deposition Measurement	dry	**QAPP Longitude**	-81.3378
Land Use	woodland - mixed, agriculture	**QAPP Elevation Meters**	372
Terrain	rolling	**QAPP Declination**	7.9
Conforms to MLM	Yes	**QAPP Declination Date**	2/22/2006
Site Telephone	(740) 679-3345	**Audit Latitude**	39.942714
Site Address 1	58163 St. Johns Road	**Audit Longitude**	-81.337914
Site Address 2		**Audit Elevation**	371
County	Noble	**Audit Declination**	-8.2
City, State	Quaker City, OH		
Zip Code	43773		
Time Zone	Eastern		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

	Present		
Fire Extinguisher	☑	New in 2015	
First Aid Kit	☑		
Safety Glasses	☑		
Safety Hard Hat	☑		
Climbing Belt	☐		
Security Fence	☐		
Secure Shelter	☐		
Stable Entry Steps	☑		

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2625-2)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition with some loose floor tiles.				
Site OK	☑	**Notes**					

Driving Directions

From I-70 take exit 193, route 513 south to Quaker City. At the 4-way stop turn right and continue approximately 0.8 miles and turn left onto CR943. Continue approximately 2 miles and turn right onto Noble County Rd 34 (also St. Johns Road). Continue approximately 1.5 miles and turn left onto a dirt road which is the driveway up a steep hill to the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	QAK172	Technician	Eric Hebert	Site Visit Date	11/30/2021

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	QAK172	Technician	Eric Hebert	Site Visit Date	11/30/2021

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	QAK172	Technician	Eric Hebert	Site Visit Date	11/30/2021

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:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID QAK172 **Technician** Eric Hebert **Site Visit Date** 11/30/2021

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?	☑	Temperature 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	QAK172	Technician	Eric Hebert	Site Visit Date	11/30/2021

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Feb 2014	☐
HASP	☑	Feb 2014	☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance 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	QAK172	Technician	Eric Hebert	Site Visit Date	11/30/2021

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Site operator refresher training July 2006
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	☑	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	QAK172	Technician	Eric Hebert	Site Visit Date	11/30/2021

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings 80% 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, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

The site operator is doing an excellent job maintaining the site. The bag that the filter is shipped in is not present at the site. If the site operator is taking the bag to another location it is possible that it could be exposed to unknown contamination.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID QAK172 **Technician** Eric Hebert **Site Visit Date** 11/30/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07066
DAS	Campbell	CR3000	2508	000410
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	1089005314	02357
Flow Rate	Apex	AXMC105LPMDPC	illegible	000888
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07139
Ozone	ThermoElectron Inc	49i A1NAA	1030244794	000676
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124683	000367
Sample Tower	Aluma Tower	B	AT-5107-E-4-8	666368
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	12533	06308
Zero air pump	Werther International	PC70/4	000814278	06870

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BFT142-Eric Hebert-12/06/2021						
1	12/6/2021	Computer	Dell	07212	Inspiron 15	Unknown
2	12/6/2021	DAS	Campbell	000498	CR3000	3815
3	12/6/2021	Elevation	Elevation	None	1	None
4	12/6/2021	Filter pack flow pump	Thomas	04279	107CA18	129800010158
5	12/6/2021	Flow Rate	Apex	000593	AXMC105LPMDPCV	illegible
6	12/6/2021	Infrastructure	Infrastructure	none	none	none
7	12/6/2021	Modem	Digi	07292	LR54	Illegible
8	12/6/2021	Ozone	ThermoElectron Inc	000746	49i A1NAA	1105347315
9	12/6/2021	Ozone Standard	ThermoElectron Inc	000330	49i A3NAA	0622717854
10	12/6/2021	Sample Tower	Aluma Tower	000863	B	unknown
11	12/6/2021	Shelter Temperature	Campbell	none	107-L	none
12	12/6/2021	Siting Criteria	Siting Criteria	None	1	None
13	12/6/2021	Temperature	RM Young	04444	41342VO	4542
14	12/6/2021	Zero air pump	Werther International	06898	C 70/4	000821905

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	3815	BFT142	Eric Hebert	12/06/2021	DAS	Primary

Das Date: 12/6 /2021
Das Time: 07:30:01
Das Day: 340

Audit Date 12/6 /2021
Audit Time 07:30:00
Audit Day 340

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/11/2021	**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	0.1005	0.1005	V	V	0.0000
7	0.3000	0.3013	0.3014	V	V	0.0001
7	0.5000	0.5040	0.5039	V	V	-0.0001
7	0.7000	0.7054	0.7053	V	V	-0.0001
7	0.9000	0.9070	0.9068	V	V	-0.0002
7	1.0000	1.0078	1.0076	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	BFT142	Eric Hebert	12/06/2021	Flow Rate	000593

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 530-H
Tfer ID	01414		
Slope	1.00185	**Intercept**	0.02453
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.01
				Cal Factor Full Scale	1
1.81%	2.04%			**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	0.04	0.000	0.01	l/m	l/m	
primary	test pt 1	1.501	1.470	1.50	0.000	1.50	l/m	l/m	2.04%
primary	test pt 2	1.501	1.470	1.50	0.000	1.50	l/m	l/m	2.04%
primary	test pt 3	1.505	1.480	1.50	0.000	1.50	l/m	l/m	1.35%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347315	BFT142	Eric Hebert	12/06/2021	Ozone	000746

Slope:	0.99407	**Slope:**	0.00000
Intercept	-0.34410	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00560	**Intercept**	0.14070
Cert Date	4/7/2021	**CorrCoff**	0.99990

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.13	-0.01	-0.08	ppb		-0.07
primary	2	15.70	15.27	14.69	ppb		-0.58
primary	3	37.59	36.75	36.09	ppb	-1.81	
primary	4	70.03	68.59	67.62	ppb	-1.42	
primary	5	112.74	110.51	109.70	ppb	-0.74	

Sensor Component	Condition	Status
Audit Pressure	760.9 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 2	True	pass
ADT >100 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Moderately clean	pass
Offset	0.30	pass
Span	1.023	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	95.9 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.60 lpm	pass
Cell A Pressure	708.1 mmHg	pass
Cell A Tmp.	32.5 C	pass
Cell B Freq.	110.2 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.60 lpm	pass
Cell B Pressure	708.7 mmHg	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4542	BFT142	Eric Hebert	12/06/2021	Temperature	04444

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00751	**Intercept**	0.16174
Cert Date	2/18/2021	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Err**	**Abs Avg Err**	**Abs Max Err**
0.09	0.13		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.41	0.25	0.000	0.3	C	0.07
primary	Temp Mid Range	23.46	23.12	0.000	23.0	C	-0.13
primary	Temp High Range	46.84	46.33	0.000	46.3	C	-0.07

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	BFT142	Eric Hebert	12/06/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
1.12	1.13		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00751	Intercept	0.16174
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.12	23.78	0.000	24.9	C	1.12
primary	Temp Mid Range	23.99	23.65	0.000	24.8	C	1.13

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component	Limited agriculture operations	**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	Intensive agriculture operations	**Condition**	20 m	**Status**	Fail
Sensor Component	Large point source of So2 or Nox	**Condition**		**Status**	pass
Sensor Component	Major highway, airport, or rail yard	**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	Large parking lot	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
BFT142	Eric Hebert	12/06/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component	Condition	Status
Sample Tower Type	Type B	pass
Conduit	N/A	pass
Met Tower	N/A	pass
Moisture Trap	Installed	pass
Moisture Trap Type	Glass bottle and filter	pass
Power Cables	Good	pass
Shelter Temp Control	Functioning	pass
Rotometer	Installed	pass
Sample Tower	Good	pass
Shelter Condition	Poor	Fail
Shelter Door	Fair	pass
Shelter Roof	Fair	pass
Shelter Floor	Poor	Fail
Shelter walls	Poor	Fail
Excessive mold present	Fair	pass
Signal Cable	Good	pass
Tubing Type	3/8 teflon	pass
Sample Train	Good	pass
System Memo		pass

Field Systems Comments

1 **Parameter:** DasComments

The new sample tower is not attached to the shelter. The sample tower is not grounded.

2 **Parameter:** SitingCriteriaCom

The site is surrounded by a corn/soy bean field, within a large-scale commercial agriculture operation.

3 **Parameter:** ShelterCleanNotes

The shelter lights are not functioning properly. The shelter is in poor condition due to being flooded during hurricanes.

4 **Parameter:** MetOpMaintCom

The meteorological tower has been removed and the temperature sensor is installed in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	BFT142	**Technician**	Eric Hebert	**Site Visit Date**	12/06/2021

Site Sponsor (agency)	EPA	**USGS Map**	Williston
Operating Group	UNC-IMS	**Map Scale**	
AQS #	37-031-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	agriculture	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	34.884668
Site Address 1	Open Grounds Farm	**Audit Longitude**	-76.620666
Site Address 2	100 Nelson Bay Rd.	**Audit Elevation**	5.3
County	Carteret	**Audit Declination**	-9.9
City, State	Beaufort, NC		
Zip Code	28516	**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	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter lights are not functioning properly. The shelter is in poor condition due to being flooded during hurricanes.				
Site OK	☑	**Notes**					

Driving Directions

From I-95 take highway 70 east through Morehead City and over the bridge. Continue through Beaufort staying on route 70 east. At East Carteret High School, route 70 turns to the right at a traffic light. Continue straight through the light on Merrimon Rd. (SR 1300), do not follow 70 to the right. Open Grounds Farm will be on the right approximately 6 miles on Merrimon Rd. Sign in at the guard house. Continue on the dirt road into the farm. Turn left at the first dirt road. The site will be visible in the corner of the field. Follow the dirt road around the field to the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	BFT142	Technician	Eric Hebert	Site Visit Date	12/06/2021

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	BFT142	Technician	Eric Hebert	Site Visit Date	12/06/2021

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 meteorological tower has been removed and the temperature sensor is installed in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	BFT142	Technician	Eric Hebert	Site Visit Date	12/06/2021

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?	☑	
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 BFT142 **Technician** Eric Hebert **Site Visit Date** 12/06/2021

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?	☑	Temperature 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 new sample tower is not attached to the shelter. The sample tower is not grounded.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	BFT142	Technician	Eric Hebert	Site Visit Date	12/06/2021

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	☑	2019	☑
HASP	☑	2019	☑
Field Ops Manual	☑	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	BFT142	Technician	Eric Hebert	Site Visit Date	12/06/2021

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	☑	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	☑	As needed	☑

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	BFT142	Technician	Eric Hebert	Site Visit Date	12/06/2021

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, 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 BFT142 **Technician** Eric Hebert **Site Visit Date** 12/06/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07212
DAS	Campbell	CR3000	3815	000498
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	129800010158	04279
Flow Rate	Apex	AXMC105LPMDPC	illegible	000593
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07292
Ozone	ThermoElectron Inc	49i A1NAA	1105347315	000746
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717854	000330
Sample Tower	Aluma Tower	B	unknown	000863
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	4542	04444
Zero air pump	Werther International	C 70/4	000821905	06898

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PNF126-Eric Hebert-12/07/2021						
1	12/7/2021	DAS	Campbell	illegible	CR3000	3817
2	12/7/2021	Ozone	ThermoElectron Inc	000741	49i A1NAA	1105347316
3	12/7/2021	Ozone Standard	ThermoElectron Inc	000363	49i A3NAA	0726124691
4	12/7/2021	Zero air pump	Werther International	06885	C 70/4	000814270

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347316	PNF126	Eric Hebert	12/07/2021	Ozone	000741

Slope:	1.02367	Slope:	0.00000
Intercept	0.36850	Intercept	0.00000
CorrCoff	0.99998	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180930075	Tfer Desc.	Ozone primary stan
Tfer ID	01115		
Slope	1.00560	Intercept	0.14070
Cert Date	4/7/2021	CorrCoff	0.99990

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.06	-0.07	0.46	ppb		0.53
primary	2	17.36	16.90	17.91	ppb		1.01
primary	3	37.29	36.46	37.38	ppb	2.49	
primary	4	71.73	70.26	71.89	ppb	2.29	
primary	5	117.31	115.00	118.40	ppb	2.91	

Sensor Component	Condition	Status
Audit Pressure	641 mmHg	pass
26.6 degree unobstructed rule	True	pass
Tree dewline >10m or below inlet	True	pass
ADT <100 vehicles further than 2	True	pass
ADT >100 vehicles further than 5	True	pass
Sample Train	Good	pass
Inlet Filter Condition	Clean	pass
Offset	-0.40	pass
Span	1.003	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	82.9 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.64 lpm	pass
Cell A Pressure	623.8 mmHg	pass
Cell A Tmp.	27.2 C	pass
Cell B Freq.	103.7 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	624.7 mmHg	pass
System Memo		pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GRS420-Eric Hebert-12/08/2021						
1	12/8/2021	Computer	Hewlett Packard	none	6730b	USH01700BY
2	12/8/2021	DAS	Environmental Sys Corp	GRSM-LR	8864	C2599
3	12/8/2021	Elevation	Elevation	None	1	None
4	12/8/2021	Filter pack flow pump	Thomas	none	107CAB18B	illegible
5	12/8/2021	Flow Rate	Mykrolis	none	FC280SAV-4S	AW9510056
6	12/8/2021	Infrastructure	Infrastructure	none	none	none
7	12/8/2021	Met tower	Rohn	none	unknown	none
8	12/8/2021	MFC power supply	Mykrolis	none	RO-32	FP9510004
9	12/8/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943903
10	12/8/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450193
11	12/8/2021	Sample Tower	Aluma Tower	90945	B	none
12	12/8/2021	Shelter Temperature	ARS	none	none	none
13	12/8/2021	Siting Criteria	Siting Criteria	None	1	None
14	12/8/2021	Temperature2meter	RM Young	none	41342VC	032955
15	12/8/2021	Zero air pump	Werther International	none	PC70/4	531385

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	C2599	GRS420	Eric Hebert	12/08/2021	DAS	Primary

Das Date: 12/8 /2021
Das Time: 10:59:00
Das Day: 342

Audit Date 12/8 /2021
Audit Time 11:00:30
Audit Day 342

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

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	2/11/2021	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
3	1.0000	0.0000	0.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Mykrolis	AW9510056	GRS420	Eric Hebert	12/08/2021	Flow Rate	none

Mfg	Mykrolis	
SN/Owner ID	FP9510004	none
Parameter:	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 530-H
Tfer ID	01414		
Slope	1.00185	**Intercept**	0.02453
Cert Date	2/10/2021	**CorrCoff**	0.99999

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Dif**	**A Avg %Diff**	**A Max % Dif**	**Cal Factor Zero**	-0.061
2.73%	2.73%			**Cal Factor Full Scale**	5.157
				Rotometer Reading:	3.05

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	0.0000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.08	0.0000	0.02	l/m	l/m	
primary	test pt 1	2.962	2.930	2.96	0.0000	3.01	l/m	l/m	2.73%
primary	test pt 2	2.964	2.930	2.96	0.0000	3.01	l/m	l/m	2.73%
primary	test pt 3	2.964	2.930	2.96	0.0000	3.01	l/m	l/m	2.73%

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**	1.5 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 Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1023943903	GRS420	Eric Hebert	12/08/2021	Ozone	none

Slope:	1.00470	Slope:	0.00000
Intercept	0.36559	Intercept	0.00000
CorrCoff	1.00000	CorrCoff	0.00000

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	1180930075	Tfer Desc.	Ozone primary stan
Tfer ID	01115		
Slope	1.00560	Intercept	0.14070
Cert Date	4/7/2021	CorrCoff	0.99990

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.18	0.03	0.43	ppb		0.4
primary	2	15.88	15.44	15.74	ppb		0.3
primary	3	38.18	37.33	37.93	ppb	1.59	
primary	4	69.14	67.72	68.53	ppb	1.19	
primary	5	107.81	105.67	106.45	ppb	0.74	

Sensor Component		Condition		Status	
Sensor Component	Audit Pressure	Condition	710 mmHg	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	ADT <100 vehicles further than 2	Condition	True	Status	pass
Sensor Component	ADT >100 vehicles further than 5	Condition	225 m	Status	Fail
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	Inlet Filter Condition	Condition	Clean	Status	pass
Sensor Component	Offset	Condition	0.000	Status	pass
Sensor Component	Span	Condition	1.001	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	90.1 kHz	Status	pass
Sensor Component	Cell A Noise	Condition	Not tested	Status	pass
Sensor Component	Cell A Flow	Condition	0.63 lpm	Status	pass
Sensor Component	Cell A Pressure	Condition	680.4 mmHg	Status	pass
Sensor Component	Cell A Tmp.	Condition	30.9 C	Status	pass
Sensor Component	Cell B Freq.	Condition	101.2 kHz	Status	pass
Sensor Component	Cell B Noise	Condition	Not tested	Status	pass
Sensor Component	Cell B Flow	Condition	0.56 lpm	Status	pass
Sensor Component	Cell B Pressure	Condition	679.5 mmHg	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	032955	GRS420	Eric Hebert	12/08/2021	Temperature2meter	none

Mfg	Extech	Parameter	Temperature
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00751	Intercept	0.16174
Cert Date	2/18/2021	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.19	0.33		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.81	0.64	0.0000	0.97	C	0.33
primary	Temp Mid Range	22.52	22.19	0.0000	22.34	C	0.15
primary	Temp High Rang	49.03	48.50	0.0000	48.60	C	0.1

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	GRS420	Eric Hebert	12/08/2021	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Err	Abs Avg Err	Abs Max Err
0.75	0.81		

Mfg	Extech	Parameter	Shelter Temperature
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00751	Intercept	0.16174
Cert Date	2/18/2021	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	19.80	19.49	0.000	20.3	C	0.81
primary	Temp Mid Range	19.92	19.61	0.000	20.3	C	0.69

Sensor Component	System Memo	Condition		Status	pass

Siting Criteria Form

Sensor Component		Condition		Status	
Sensor Component	Limited agriculture operations	Condition		Status	pass
Sensor Component	City > 50,000	Condition	35 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	Intensive agriculture operations	Condition		Status	pass
Sensor Component	Large point source of So2 or Nox	Condition		Status	pass
Sensor Component	Major highway, airport, or rail yard	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	Large parking lot	Condition		Status	pass

Infrastructure Data For

Site ID	GRS420	Technician	Eric Hebert	Site Visit Date	12/08/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2961-1)	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	Moisture Trap Type	Condition	Filter	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
Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Temperature2meter	GRS420	Eric Hebert	12/08/2021	Properly Sited	RM Young	4705	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone sample train is leak-tested each week after the inlet filter is changed.

2 **Parameter:** SitingCriteriaCom

The site is located on a ridge top with the sampling height at the tops of the trees on the ridge. The site is within 40 km of Knoxville and other major sources.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** MetSensorComme

The temperature sensor has been relocated from 10 meters to approximately 3.9 meters above the ground.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	GRS420	**Technician**	Eric Hebert	**Site Visit Date**	12/08/2021

Site Sponsor (agency)	NPS	**USGS Map**	Blockhouse
Operating Group	NPS	**Map Scale**	
AQS #	47-009-0101	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, Hg, SO2, NOx, PM2.5, PM10,	**QAPP Latitude**	35.6331
Deposition Measurement	dry	**QAPP Longitude**	-83.9422
Land Use	woodland - mixed	**QAPP Elevation Meters**	793
Terrain	complex (ridge-top)	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	35.633482
Site Address 1	Look Rock	**Audit Longitude**	-83.941606
Site Address 2	Foothills Parkway	**Audit Elevation**	801
County	Blount	**Audit Declination**	5.5
City, State	Maryville, TN		
Zip Code	37803	**Fire Extinguisher** ☑	inspected Sept 2019
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 2961-1)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, clean, neat, and well organized.				
Site OK	☑	**Notes**					

Driving Directions From Maryville proceed east on 321 and turn right (south) onto the Foothills Parkway. Continue approximately 11 miles. Just before reaching the Look Rock parking area and trail, turn right on a gravel road through a locked NPS gate. The site is approximately 200 meters up the trail on the right.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	GRS420	Technician	Eric Hebert	Site Visit Date	12/08/2021

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:

The temperature sensor has been relocated from 10 meters to approximately 3.9 meters above the ground.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	GRS420	Technician	Eric Hebert	Site Visit Date	12/08/2021

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	GRS420	Technician	Eric Hebert	Site Visit Date	12/08/2021

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?	☑	

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	GRS420	Technician	Eric Hebert	Site Visit Date	12/08/2021

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 grounded to shelter, and slightly bent at hinge.	

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	GRS420	Technician	Eric Hebert	Site Visit Date	12/08/2021

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	☑	10/30/2016	☐
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	GRS420	Technician	Eric Hebert	Site Visit Date	12/08/2021

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	☑	Weekly	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Weekly	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	As needed	☑

1	Do multi-point calibration gases go through the complete sample train including all filters?	☑	
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	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 ozone sample train is leak-tested each week after the inlet filter is changed.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	GRS420	Technician	Eric Hebert	Site Visit Date	12/08/2021

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings in winter, changed in afternoon in summer
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	☑	Weekly	☑
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	As needed	☑
Sample Line Check for Dirt/Water	☑	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 GRS420 **Technician** Eric Hebert **Site Visit Date** 12/08/2021

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6730b	USH01700BY	none
DAS	Environmental Sys Corp	8864	C2599	GRSM-LR
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	illegible	none
Flow Rate	Mykrolis	FC280SAV-4S	AW9510056	none
Infrastructure	Infrastructure	none	none	none
Met tower	Rohn	unknown	none	none
MFC power supply	Mykrolis	RO-32	FP9510004	none
Ozone	ThermoElectron Inc	49i A3NAA	1023943903	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1130450193	none
Sample Tower	Aluma Tower	B	none	90945
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	032955	none
Zero air pump	Werther International	PC70/4	531385	none

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 3/8/2022 07:45:40

SiteVisitDate	Site	Technician
10/24/2021	ABT147	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	0.99979	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.04868	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.3	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.03	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.11	ppb	**P**

EEMS Spot Report

Data Compiled: 3/4/2022 12:53:34

SiteVisitDate	Site	Technician
10/21/2021	ALH157	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	246.78	c	**Fail**
2	Temperature max error	P	4	0.5	3	246.78	c	**Fail**
3	Ozone Slope	P	0	1.1	4	0.99079	unitless	**P**
4	Ozone Slope	P	0	1.1	4	0.99079	unitless	**P**
5	Ozone Intercept	P	0	5	4	-1.30716	ppb	**P**
6	Ozone Intercept	P	0	5	4	-1.30716	ppb	**P**
7	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
8	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
9	Ozone % difference avg	P	7	10	4	5.0	%	**P**
10	Ozone Absolute Difference g1	P	7	3	1	-1.1	ppb	**P**
11	Ozone Absolute Difference g2	P	7	1.5	1	-1.43	ppb	**P**
12	Flow Rate average % difference	P	10	5	6	0.04	%	**P**
13	Flow Rate max % difference	P	10	5	6	0.13	%	**P**
14	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**
15	Shelter Temperature average error	P	5	2	21	0.32	c	**P**
16	Shelter Temperature max error	P	5	2	21	0.56	c	**P**

SiteVisitDate	Site	Technician
10/21/2021	ALH157	Korey Devins

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is located on a privately operated farm which rotates corn and soy bean crops.

2 **Parameter:** ShelterCleanNotes

The shelter floor has been repaird recently. Walls have signs of leaks.

3 **Parameter:** MetSensorComme

Temperature mounted in naturally aspirated shield on sample tower.

4 **Parameter:** MetOpMaintCom

The temperature sensor is not functioning and reading -247 deg C. It was not audited.

EEMS Spot Report

Data Compiled: 3/4/2022 15:55:13

SiteVisitDate	Site	Technician
12/06/2021	BFT142	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	15	0.09	c	**P**
2	Temperature max error	P	4	0.5	15	0.13	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99407	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.3441	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.9	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.07	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.58	ppb	**P**
9	Flow Rate average % difference	P	10	5	6	1.81	%	**P**
10	Flow Rate max % difference	P	10	5	6	2.04	%	**P**
11	DAS Voltage average error	P	7	0.003	77	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	14	1.12	c	**P**
13	Shelter Temperature max error	P	5	2	14	1.13	c	**P**

SiteVisitDate	Site	Technician
12/06/2021	BFT142	Eric Hebert

Field Systems Comments

1 **Parameter:** DasComments

The new sample tower is not attached to the shelter. The sample tower is not grounded.

2 **Parameter:** SitingCriteriaCom

The site is surrounded by a corn/soy bean field, within a large-scale commercial agriculture operation.

3 **Parameter:** ShelterCleanNotes

The shelter lights are not functioning properly. The shelter is in poor condition due to being flooded during hurricanes.

4 **Parameter:** MetOpMaintCom

The meteorological tower has been removed and the temperature sensor is installed in a naturally aspirated shield on the sample tower.

EEMS Spot Report

Data Compiled: 3/3/2022 13:33:55

SiteVisitDate	Site	Technician
10/13/2021	BVL130	Korey Devins

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	0.27	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	8	0.05	m/s	**P**
5	Wind Speed max error below 5m/s in m/s	P	3	0.5	8	0.20	m/s	**P**
6	Wind Speed average % difference above 5 m/s	P	3	5	8	0.0	%	**P**
7	Wind Speed max % difference above 5 m/s	P	3	5	8	0.0	%	**P**
8	Wind Speed Torque average error	P	3	0.5	1	0.35	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	8	7.0	degrees	**Fail**
11	Wind Direction Input Deg True max error (deg)	P	2	5	8	9	degrees	**Fail**
12	Wind Direction Linearity average error (deg)	P	2	5	16	1.8	degrees	**P**
13	Wind Direction Linearity max error (deg)	P	2	5	16	5	degrees	**P**
14	Wind Direction Torque average error	P	2	30	1	35	g-cm	**Fail**
15	Wind Direction Torque max error	P	2	30	1	40	g-cm	**Fail**
16	Temperature average error	P	4	0.5	12	0.12	c	**P**
17	Temperature max error	P	4	0.5	12	0.22	c	**P**
18	Relative Humidity average above 85%	P	6	10	1	2.6	%	**P**
19	Relative Humidity max above 85%	P	6	10	1	2.6	%	**P**
20	Relative Humidity average below 85%	P	6	10	2	1.5	%	**P**
21	Relative Humidity max below 85%	P	6	10	2	2.8	%	**P**
22	Solar Radiation % diff of avg	P	9	10	42	4.68	%	**P**
23	Solar Radiation % diff of max STD value	P	9	10	42	0.80	%	**P**
24	Precipitation average % difference	P	1	10	2	1.0	%	**P**
25	Precipitation max % difference	P	1	10	2	2.0	%	**P**
26	Ozone Slope	P	0	1.1	4	0.99738	unitless	**P**
27	Ozone Intercept	P	0	5	4	-0.60475	ppb	**P**
28	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
29	Ozone % difference avg	P	7	10	4	2.1	%	**P**
30	Ozone Absolute Difference g1	P	7	3	1	-0.53	ppb	**P**
31	Ozone Absolute Difference g2	P	7	1.5	1	-0.69	ppb	**P**
32	Flow Rate average % difference	P	10	5	4	0.89	%	**P**
33	Flow Rate max % difference	P	10	5	4	1.33	%	**P**

SiteVisitDate	Site	Technician
10/13/2021	BVL130	Korey Devins

34	DAS Voltage average error	P	7	0.003	56	0.0000	V	**P**
35	Surface Wetness Sensitivity test on	P	12	10000	1	170	k ohms	**P**
36	Surface Wetness Sensitivity test off	P	12	10000	1	190	k ohms	**P**
37	Surface Wetness Response	P	12	0.5	1	1.00		**P**
38	Shelter Temperature average error	P	5	2	21	0.32	c	**P**
39	Shelter Temperature max error	P	5	2	21	0.59	c	**P**

SiteVisitDate	Site	Technician
10/13/2021	BVL130	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.

2 **Parameter:** Wind Direction **SensorComponent:** Orientation **CommentCode:** 151

The wind direction orientation is outside the acceptance limit of 5 degrees. This is due to a combined error from the crossarm alignment and sensor calibration.

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

Ozone and NCORE sample line filters are replaced, and the sample lines are leaked tested, every 2 weeks.

2 **Parameter:** SitingCriteriaCom

The site is located in an agricultural and atmospheric research center. There are crops within 50 meters.

3 **Parameter:** ShelterCleanNotes

The shelter still smells like rodent excrement. The shelter door does not completely seal and water enters during heavy rain. The water has caused damage to the floor.

4 **Parameter:** MetSensorComme

The tipping bucket rain gage is mounted near the meteorological tower and in violation of the 45 degree rule.

5 **Parameter:** MetOpMaintCom

The signal cables are showing signs of wear and previous repair.

EEMS Spot Report

Data Compiled: 3/8/2022 07:48:30

SiteVisitDate	Site	Technician
10/05/2021	CAV436	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	0.98549	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.0432	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.7	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.12	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.28	ppb	**P**

EEMS Spot Report

Data Compiled: 3/4/2022 14:57:04

SiteVisitDate	Site	Technician
11/11/2021	CDR119	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	24	0.25	c	**P**
2	Temperature max error	P	4	0.5	24	0.33	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97934	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.12191	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.2	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.51	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.44	ppb	**P**
9	Flow Rate average % difference	P	10	5	2	1.32	%	**P**
10	Flow Rate max % difference	P	10	5	2	1.32	%	**P**
11	DAS Voltage average error	P	7	0.003	35	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.26	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.36	c	**P**

SiteVisitDate	Site	Technician
11/11/2021	CDR119	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:** SitingCriteriaCom

Site is in a wooded valley, within 30 meters of a lightly traveled road. Large diesel trucks use the road. Trees are taller than the sample tower and within 20 meters of the sample tower.

2 **Parameter:** ShelterCleanNotes

The shelter is in fair condition with some rot on the walls below the air conditioner.

EEMS Spot Report

Data Compiled: 3/8/2022 07:50:30

SiteVisitDate	Site	Technician
10/01/2021	CHA467	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	0.97452	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.26322	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.16	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.02	ppb	**P**

EEMS Spot Report

Data Compiled: 3/8/2022 07:52:19

SiteVisitDate	Site	Technician
10/12/2021	DEN417	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	1.00407	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.87987	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.1	%	**P**
5	Ozone Absolute Difference g2	P	7	1.5	1	0.95	ppb	**P**

EEMS Spot Report

Data Compiled: 3/8/2022 07:54:31

SiteVisitDate	Site	Technician
10/16/2021	ESP127	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00811	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.28627	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.13	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.37	ppb	**P**

EEMS Spot Report

Data Compiled: 3/4/2022 16:13:45

SiteVisitDate	Site	Technician
12/08/2021	GRS420	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	0.19	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.33	c	**P**
3	Ozone Slope	P	0	1.1	4	1.0047	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.36559	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.40	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.30	ppb	**P**
9	Flow Rate average % difference	P	10	5	8	2.73	%	**P**
10	Flow Rate max % difference	P	10	5	8	2.73	%	**P**
11	DAS Voltage average error	P	3	0.003	2	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	16	0.75	c	**P**
13	Shelter Temperature max error	P	5	2	16	0.81	c	**P**

SiteVisitDate	Site	Technician
12/08/2021	GRS420	Eric Hebert

Field Performance Comments

1 **Parameter:** Temperature2meter **SensorComponent:** Properly Sited **CommentCode:** 142

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone sample train is leak-tested each week after the inlet filter is changed.

2 **Parameter:** SitingCriteriaCom

The site is located on a ridge top with the sampling height at the tops of the trees on the ridge. The site is within 40 km of Knoxville and other major sources.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** MetSensorComme

The temperature sensor has been relocated from 10 meters to approximately 3.9 meters above the ground.

EEMS Spot Report

Data Compiled: 3/4/2022 13:52:36

SiteVisitDate	Site	Technician
11/04/2021	LAV410	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	0.61	c	**Fail**
2	Temperature2meter max error	P	5	0.5	3	0.71	c	**Fail**
3	Ozone Slope	P	0	1.1	4	1.015	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.86732	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99991	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.8	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.03	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.16	ppb	**P**
9	Flow Rate average % difference	P	10	5	10	4.93	%	**P**
10	Flow Rate max % difference	P	10	5	10	5.16	%	**Fail**
11	DAS Voltage average error	P	9	0.003	63	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	3	1.22	c	**P**
13	Shelter Temperature max error	P	5	2	3	1.5	c	**P**

SiteVisitDate	Site	Technician
11/04/2021	LAV410	Martin Valvur

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Accuracy **CommentCode:** 77

The recorded flow rate data are accurate as recorded. The flow rate is not at the target flow rate.

2 **Parameter:** Ozone **SensorComponent:** Cell A Tmp. **CommentCode:** 99

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone inlet filter is changed and the sample line conditioned every two weeks or as needed.

2 **Parameter:** SitingCriteriaCom

The site is located at the end of a park service facility parking lot, in a fire station. The tree line is near the building, but the prevailing wind direction is from the clearing. Tree height above the sample inlet is not twice as far away as it is high above the inlet.

3 **Parameter:** ShelterCleanNotes

The inside equipment is located in room within the fire station, clean, neat, and organized.

4 **Parameter:** PollAnalyzerCom

Trees violate the ozone sample inlet siting criteria.

EEMS Spot Report

Data Compiled: 3/4/2022 13:16:43

SiteVisitDate	Site	Technician
10/22/2021	MCK131	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	0.12	c	**P**
2	Temperature max error	P	4	0.5	9	0.20	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98026	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.74366	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	4.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.7	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.23	ppb	**P**
9	Flow Rate average % difference	P	10	5	8	0.44	%	**P**
10	Flow Rate max % difference	P	10	5	8	0.66	%	**P**
11	DAS Voltage average error	P	7	0.003	70	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	15	0.37	c	**P**
13	Shelter Temperature max error	P	5	2	15	0.68	c	**P**

SiteVisitDate	Site	Technician
10/22/2021	MCK131	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:** ShelterCleanNotes

The shelter is neat and well organized.

EEMS Spot Report

Data Compiled: 3/4/2022 13:32:32

SiteVisitDate	Site	Technician
10/22/2021	MCK231	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	0.22	c	**P**
2	Temperature max error	P	4	0.5	9	0.27	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99682	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.20351	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.7	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.38	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.18	ppb	**P**
9	Flow Rate average % difference	P	10	5	2	0.44	%	**P**
10	Flow Rate max % difference	P	10	5	2	0.67	%	**P**
11	DAS Voltage average error	P	7	0.003	91	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	15	0.18	c	**P**
13	Shelter Temperature max error	P	5	2	15	0.42	c	**P**

SiteVisitDate	Site	Technician
10/22/2021	MCK231	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:** ShelterCleanNotes

The site instruments are located in the MCK131 shelter. The same site operator is servicing both sites.

EEMS Spot Report

Data Compiled: 3/8/2022 07:56:15

SiteVisitDate	Site	Technician
11/29/2021	MKG113	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01421	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.19975	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.9	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.29	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.49	ppb	**P**

EEMS Spot Report

Data Compiled: 3/4/2022 10:45:22

SiteVisitDate	Site	Technician
10/19/2021	OXF122	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	0.10	c	**P**
2	Temperature max error	P	4	0.5	3	0.13	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01494	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.48717	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.2	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.41	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.42	ppb	**P**
9	Flow Rate average % difference	P	10	5	8	0.60	%	**P**
10	Flow Rate max % difference	P	10	5	8	0.60	%	**P**
11	DAS Voltage average error	P	7	0.003	84	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.50	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.62	c	**P**

SiteVisitDate	Site	Technician
10/19/2021	OXF122	Korey Devins

Field Systems Comments

1 **Parameter:** DasComments

The met tower is operated by the university and the temperature sensor is mounted on the sample tower in a naturally aspirated shield.

2 **Parameter:** SitingCriteriaCom

The site is located in university agriculture research facility.

3 **Parameter:** ShelterCleanNotes

The shelter roof has been repaired.

EEMS Spot Report

Data Compiled: 3/4/2022 10:05:14

SiteVisitDate	Site	Technician
10/06/2021	PAL190	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	21	0.07	c	**P**
2	Temperature max error	P	4	0.5	21	0.14	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99513	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.19568	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.5	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.22	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.33	ppb	**P**
9	Flow Rate average % difference	P	10	5	8	0.33	%	**P**
10	Flow Rate max % difference	P	10	5	8	0.33	%	**P**
11	DAS Voltage average error	P	7	0.003	77	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.23	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.43	c	**P**

SiteVisitDate	Site	Technician
10/06/2021	PAL190	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone sample train is leak tested every two weeks.

2 **Parameter:** SitingCriteriaCom

The site is located 40 km southeast of Amarillo TX which has a population of approximately 178,000.

3 **Parameter:** ShelterCleanNotes

The shelter is in good condition.

4 **Parameter:** MetSensorComme

The meteorological tower and sensors have been removed.

5 **Parameter:** MetOpMaintCom

The temperature signal cable is showing signs of wear.

EEMS Spot Report

Data Compiled: 3/4/2022 15:14:32

SiteVisitDate	Site	Technician
11/12/2021	PAR107	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	0.08	c	**P**
2	Temperature max error	P	4	0.5	21	0.10	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98329	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.46557	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.2	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.33	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.88	ppb	**P**
9	Flow Rate average % difference	P	10	5	6	0.66	%	**P**
10	Flow Rate max % difference	P	10	5	6	0.66	%	**P**
11	DAS Voltage average error	P	7	0.003	84	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.46	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.86	c	**P**

SiteVisitDate	Site	Technician
11/12/2021	PAR107	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:** SitingCriteriaCom

The city of Parsons, estimated population 1500, is within 5 km of the site.

2 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 3/4/2022 14:35:54

SiteVisitDate	Site	Technician
11/10/2021	PED108	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	0.26	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00697	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.05882	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.4	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.11	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.07	ppb	**P**
9	Flow Rate average % difference	P	10	5	4	0.45	%	**P**
10	Flow Rate max % difference	P	10	5	4	1.35	%	**P**
11	DAS Voltage average error	P	7	0.003	84	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.46	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.86	c	**P**

SiteVisitDate	Site	Technician
11/10/2021	PED108	Korey Devins

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is in a clearing in an evergreen plantation in the Prince Edward-Gallion State Forest. Trees were cut within the last 11 years to increase the size of the clearing. The tree line is encroaching again and is between 25 and 35 meters from the site.

2 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 3/8/2022 07:58:36

SiteVisitDate	Site	Technician
12/07/2021	PNF126	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.02367	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.36850	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.4	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.53	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	1.01	ppb	**P**

EEMS Spot Report

Data Compiled: 3/4/2022 15:35:43

SiteVisitDate	Site	Technician
11/30/2021	QAK172	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	21	0.22	c	**P**
2	Temperature max error	P	4	0.5	21	0.25	c	**P**
3	Ozone Slope	P	0	1.1	4	1.03475	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.39443	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.2	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.27	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.07	ppb	**P**
9	Flow Rate average % difference	P	10	5	2	2.74	%	**P**
10	Flow Rate max % difference	P	10	5	2	2.74	%	**P**
11	DAS Voltage average error	P	7	0.003	77	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	4	0.70	c	**P**
13	Shelter Temperature max error	P	5	2	4	0.95	c	**P**

SiteVisitDate	Site	Technician
11/30/2021	QAK172	Eric Hebert

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is doing an excellent job maintaining the site. The bag that the filter is shipped in is not present at the site. If the site operator is taking the bag to another location it is possible that it could be exposed to unknown contamination.

2 **Parameter:** ShelterCleanNotes

The shelter is in fair condition with some loose floor tiles.

EEMS Spot Report

Data Compiled: 3/4/2022 11:57:49

SiteVisitDate	Site	Technician
10/20/2021	SAN189	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	18	0.19	c	**P**
2	Temperature max error	P	4	0.5	18	0.35	c	**P**
3	Ozone Slope	P	0	1.1	4	0.96856	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.07763	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	6.4	%	**P**
7	Ozone Absolute Difference g2	P	7	1.5	1	-1.54	ppb	**Fail**
8	Flow Rate average % difference	P	10	5	6	0.22	%	**P**
9	Flow Rate max % difference	P	10	5	6	0.33	%	**P**
10	DAS Voltage average error	P	7	0.003	77	0.0001	V	**P**
11	Shelter Temperature average error	P	5	2	21	0.28	c	**P**
12	Shelter Temperature max error	P	5	2	21	0.65	c	**P**

SiteVisitDate	Site	Technician
10/20/2021	SAN189	Martin Valvur

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Accuracy **CommentCode:** 201

Further investigation of the ozone measurement system revealed that the site analyzer was operating with a significant difference between the A and B sample cells. This condition is an indication of an internal leak between the reference and sample cell and will contribute to the measurement error.

Field Systems Comments

1 **Parameter:** DasComments

The met tower is not currently in use and it is somewhat unstable.

2 **Parameter:** DocumentationCo

The site operator reported that all instrument manuals are kept at the office.

3 **Parameter:** ShelterCleanNotes

The shelter is in very good condition.

EEMS Spot Report

Data Compiled: 3/8/2022 08:00:16

SiteVisitDate	Site	Technician
10/15/2021	SPD111	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01805	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.21647	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.4	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.23	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.49	ppb	**P**

EEMS Spot Report

Data Compiled: 3/4/2022 10:27:11

SiteVisitDate	Site	Technician
10/16/2021	STK138	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	0.21	c	**P**
2	Temperature max error	P	4	0.5	18	0.43	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99708	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.67203	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.6	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.39	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.82	ppb	**P**
9	Flow Rate average % difference	P	10	5	4	0.67	%	**P**
10	Flow Rate max % difference	P	10	5	4	0.67	%	**P**
11	DAS Voltage average error	P	7	0.003	84	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	21	0.39	c	**P**
13	Shelter Temperature max error	P	5	2	21	0.62	c	**P**

SiteVisitDate	Site	Technician
10/16/2021	STK138	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 ozone sample train is leak tested every 2 weeks.

2 **Parameter:** SitingCriteriaCom

The site is located in a corn field on a cattle farm. Corn is planted within 10 meters.

3 **Parameter:** ShelterCleanNotes

There are signs of leaks on the walls and floor rot.

EEMS Spot Report

Data Compiled: 3/4/2022 11:25:33

SiteVisitDate	Site	Technician
10/19/2021	THR422	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	0.33	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.35	c	**P**
3	Flow Rate average % difference	P	10	5	6	11.07	%	**Fail**
4	Flow Rate max % difference	P	10	5	6	11.48	%	**Fail**
5	DAS Voltage average error	P	9	0.003	70	0.0004	V	**P**
6	Shelter Temperature average error	P	5	2	24	0.56	c	**P**
7	Shelter Temperature max error	P	5	2	24	1.28	c	**P**

SiteVisitDate	Site	Technician
10/19/2021	THR422	Martin Valvur

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Leak Test **CommentCode:** 207

The dry deposition sample tubing is broken and air is not being pulled through the filter pack.

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Gloves are not used to handle the filter pack. The filter bag is used as a glove.

2 **Parameter:** DasComments

The met tower is no longer in use.

3 **Parameter:** SiteOpsProcedures

The ozone sample train does not have a means to introduce test gas at the sample inlet. Results of routine zero, span, precision, and any multipoint calibration checks are maintained by the state personnel who perform the tests. The two inlet filters in the sample train are creating a large pressure drop.

4 **Parameter:** SitingCriteriaCom

The site is located 200 meters from an interstate rest area, and 300 meters from interstate 94. The rest area can have parked and idling vehicles for extended periods.

5 **Parameter:** ShelterCleanNotes

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

6 **Parameter:** PollAnalyzerCom

The ozone monitor is operated by the state of North Dakota.

7 **Parameter:** MetSensorComme

The 2-meter temperature sensor is mounted to the sample tower, which is attached to the site shelter. The sensor is 3.7 meters above ground and close to the shelter.