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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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	$\leq \pm 10.0\%$ 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	$\leq \pm 0.5$ mps below 5.0 mps input; $\leq \pm 5.0\%$ 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	\leq ± 5.0% of designated rate
Ozone	Slope	Linear regression of multi-	$0.9000 \le m \le 1.1000$
Ozone	Intercept	point test gas concentration as	-5.0 ppb ≤ b ≤ 5.0 ppb
Ozone	Correlation Coefficient	measured with a certified transfer standard	0.9950 ≤ r
Ozone	Percent Difference	Comparison with Level 2 standard concentration	$\leq \pm 15.1\%$ of test gas concentration and $\leq \pm 0.0015$ 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.

File location 3 EEMS/transfer/clients/EPA

- 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	СО	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

File location 4 EEMS/transfer/clients/EPA

Site ID	Sponsor	Date	MET	FSA	O3 PE	SO2	СО	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
ОН09	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

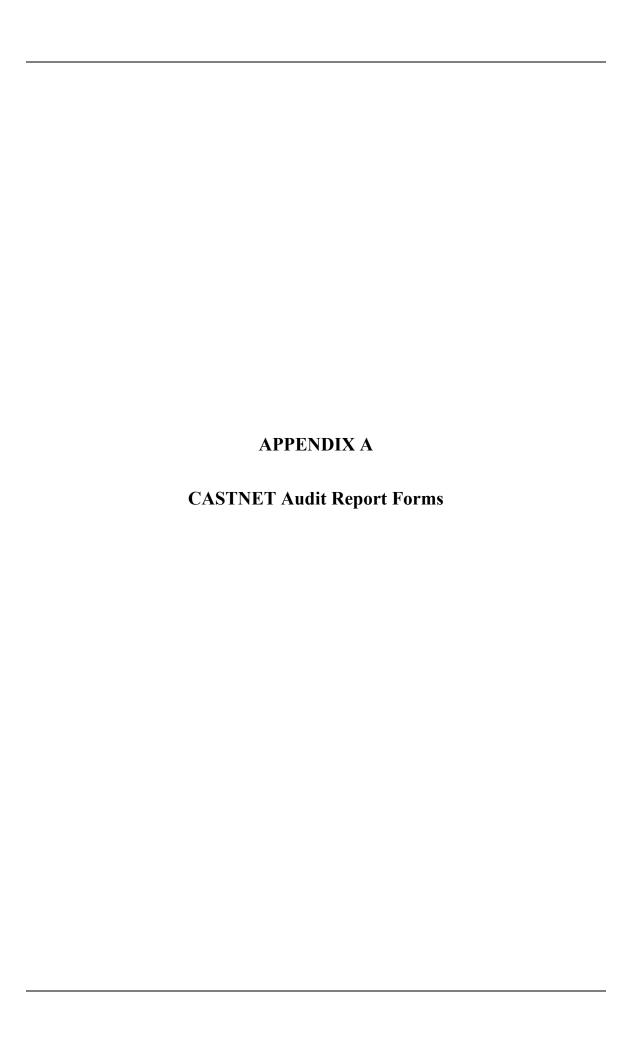
Site ID	Sponsor_	Date	NTN	MDN	AMoN
OK06		11/30/2021		1	
ОН99		11/30/2021			1
OK04		12/1/2021		1	
OK01		12/2/2021		1	
NC06		12/6/2021	1		1
NC02		12/7/2021			1
TN01	NPS	12/8/2021			1
NC29		12/16/2021	1		
NC08		12/17/2021		1	
GA99		12/20/2021	1		

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.



Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
СНА	467-Martii	n 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 S	erial Number '	Ta Site	'	Technician	Site Visit Date	Parame	eter Owner ID
ThermoElectron Inc	CM08460007	CHA467	•	Martin Valvur	10/01/2021	Ozone	none
Slope: 0.9	97452 Slope:	C	0.00000	Mfg	ThermoElectron	Inc Pa	rameter ozone
Intercept -0.2	26322 Interce	ept (0.0000	Serial Number	49CPS-70008-3	364 Tf	er Desc. Ozone primary stan
CorrCoff 0.9	99998 Corr C	off	0.00000	Tfer ID	01110		
DAS 1:	DAS	32:		Slope	1.0034	40 Inter	cept 0.02230
A Avg % Diff: A Ma	x % Di A A	vg %Diff A	Max % Di	•			
0.0%	0.0%			Cert Date	1/20/202	21 Corr	*Coff 1.00000
UseDescription (ConcGroup	Tfer Raw	Tfer Cor	r Site	Site Unit	RelPer	Dif 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				ition 638 mmHg		Status	
Sensor Component	26.6 degree ui	nobstructed ru	le Cond	ition True		Status	pass
Sensor Component	Tree dewline >	-10m or below	inlet Cond	ition True		Status	pass
Sensor Component	ADT <100 veh	icles further th	nan 2 Cond	ition 150 m		Status	fail
Sensor Component	ADT >100 veh	icles further th	nan 5 Cond	ition True		Status	pass
Sensor Component	Sample Train		Cond	ition Good		Status	pass
Sensor Component	Inlet Filter Con	ndition	Cond	ition Clean		Status	pass
Sensor Component	Offset		Cond	ition -0.1		Status	pass
Sensor Component	Span		Cond	ition 1.019		Status	pass
Sensor Component	Zero Voltage		Cond	ition 0.000		Status	pass
Sensor Component	Fullscale Volta	ige	Cond	ition 0.9998		Status	pass
Sensor Component	Cell A Freq.		Cond	ition 90.1 kHz		Status	pass
Sensor Component	Cell A Noise			ition 1.5 ppb		Status	pass
Sensor Component			Cond	ition 0.70 lpm		Status	pass
Sensor Component	Cell A Pressur	е	Cond	ition 631.5 mmHg		Status	pass
Sensor Component	Cell A Tmp.		Cond	ition 35.1 C		Status	pass
Sensor Component	Cell B Freq.		Cond	ition 91.5 kHz		Status	pass
Sensor Component	Cell B Noise		Cond	ition 1.9 ppb		Status	pass
Sensor Component	Cell B Flow		Cond	ition 0.67 lpm		Status	pass
Sensor Component	Cell B Pressur	е	Cond	ition 631.5 mmHg		Status	pass
Sensor Component	System Memo		Cond	ition		Status	pass

Site Inventory by Site Visit

Site	Site Visit Date Parameter		e Parameter Mfg Owner ID		Model Number	Serial Number
CAV	436-Martir	ı 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 Numbe	er Ta Site		Te	chnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElectron Inc	1231755663	CAV43	86	Ma	artin Valvur	10/05/2021	Ozone		none
Slope: Intercept CorrCoff		rcept	0.00000	0	Mfg Serial Number Tfer ID	ThermoElectron 49CPS-70008-3			ozone c. Ozone primary stan
DAS 1: A Avg % Diff: A		AS 2: Avg %Diff A	A Max '	% Di	Slope Cert Date	1.003-		rcept rCoff	0.02230
UseDescription	ConcGroup	Tfer Raw		fer Corr	Site	Site Unit	RelPer	D:t	AbsDif
primary	1	0.12	11	0.09	0.21	ppb	Ken ei	ווע	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	1	115.99	114.40	ppb		-1.38	
Sensor Compon	ent Audit Press	ure		Condition	655.4 mmHg		Status	pass	
Sensor Compon	ent 26.6 degree	unobstructed r	ule	Condition	on True		Status	pass	
Sensor Compon	ent Tree dewlin	e >10m or belov	w inlet	Condition	True		Status	pass	
Sensor Compon	ent ADT <100 v	ehicles further t	than 2	Condition	on 150 m		Status	Fail	
Sensor Compon	ent ADT >100 v	ehicles further t	than 5	Condition	on 150 m		Status	Fail	
Sensor Compon	ent Sample Tra	in		Condition	Good		Status	pass	
Sensor Compon	ent Inlet Filter C	Condition		Condition	Clean		Status	pass	
Sensor Compon	ent Offset			Condition	on -0.1		Status	pass	
Sensor Compon	ent Span			Condition	on 0.992		Status	pass	
Sensor Compon	ent Zero Voltag	e		Condition	on N/A		Status	pass	
Sensor Compon	ent Fullscale Vo	oltage		Condition	n N/A		Status	pass	
Sensor Compon	cent Cell A Freq.			Condition	93.6 kHz		Status	pass	
Sensor Compon	ent Cell A Noise)		Condition	0.7 ppb		Status	pass	
Sensor Compon	ent Cell A Flow			Condition	0.64 lpm		Status	pass	
Sensor Compon	ent Cell A Press	sure		Condition	638.6 mmHg		Status	pass	
Sensor Compon	ent Cell A Tmp.			Condition	37.1 C		Status	pass	
Sensor Compon	Cell B Freq.			Condition	99.9 kHz		Status	pass	
Sensor Compon	Cell B Noise)		Condition	0.8 ppb		Status	pass	
Sensor Compon	Cell B Flow			Condition	0.63 lpm		Status	pass	
Sensor Compon	ent Cell B Press	sure		Condition	638.0 mmHg		Status	pass	
Sensor Compon	ent System Mer	no		Condition	on		Status	pass	

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PAL.	190-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	В	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 0 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Campbell 2122 PAL190 Martin Valvur 10/06/2021 DAS Primary Das Date: 10/6 /2021 **Audit Date** 10/6 /2021 ΗY Parameter DAS Mfg 11:14:00 11:14:00 Das Time: **Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** Das Day: 279 **Audit Day** 279 Tfer ID 01322 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0002 0.0003 0.0002 0.0003 6/15/2014 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 95740243 Tfer Desc. DVM 01312 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/11/2021 1.00000 CorrCoff **Cert Date** Channel Input DVM Output DAS Output InputUnit OutputUnit Difference 7 V 0.0000 0.0021 0.0020 -0.0001 7 0.1000 0.0997 0.0995 V V -0.0002 7 0.3000 0.2996 0.2995 V V -0.0001 V V 7 0.5000 0.4999 0.4996 -0.0003 V 0.7000 V -0.0001 7 0.6996 0.6995 V V 0.9000 0.8999 0.8996 -0.0003 7 1.0000 0.9992 0.9991 V V -0.0001

Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter Martin Valvur 10/06/2021 000654 Apex 54774 PAL190 Flow Rate Mfg BIOS Parameter Flow Rate 148613 Tfer Desc. BIOS 220-H **Serial Number** 01421 Tfer ID 0.00160 **Slope** 1.00850 Intercept 2/10/2021 0.99999 CorrCoff **Cert Date** 0.05 **DAS 2: DAS 1:** Cal Factor Zero 1.04 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.33% 0.33% 3.2 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Test type Input l/m Input Corr MfcDisp. Desc. primary pump off 0.000 0.000-0.03 0.0000.01 1/ml/m leak check 0.000 0.000 -0.01 0.0000.04 1/ml/mprimary 2.98 1/m 0.33% test pt 1 3.030 3.000 0.000 3.01 1/mprimary 3.040 3.010 2.98 0.000 3.00 1/m1/m-0.33% primary test pt 2 2.98 0.000-0.33% test pt 3 3.040 3.010 3.00 1/m1/mprimary Sensor Component Leak Test Condition Status pass **Condition** Good Status pass **Sensor Component** Tubing Condition Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry Sensor Component Moisture Present Condition No moisture present Status pass Sensor Component Filter Distance Condition 6.0 cm Status pass

Condition 0.5 cm

Condition 135 deg

Condition

Status pass

Status pass

Status pass

Sensor Component Filter Depth

Sensor Component Filter Azimuth

Sensor Component System Memo

Ozone Data Form

A vg % Diff: A Max % Di	Mfg	S	erial Numb	er Ta	Site		Te	Technician Site Visit D		ite Visit Date Parameter		Owner 1	Owner ID	
Intercept	ThermoElectron I	nc 1	1105347314		PAL19	90	Ma	artin Valvur	10/06/2021	Ozone		000726		
Intercept	Slana	0.00513 Starras 0.00000 Mfg ThermoElectro		ThermoElectron	Inc Pa	ıramete	r ozone							
DAS 1: DAS 2: Slope 1.00340 Intercept 0.0000	-	0.00000						v etan						
DAS 1: DAS 2: Slope	•			•			_				er Desc	. Ozone primar	y Stair	
A Avg % Diff: A Max % Di							_	Tfer ID	01110					
UseDescription ConcGroup Tfer Raw Tfer Corr Site Site Unit RelPerDif AbsDif	DAS 1:		D	AS 2:				Slope	1.0034	0 Inte	rcept	0.0	2230	
UseDescription ConcGroup Tfer Raw Tfer Corr Site Site Unit RelPerDif AbsDif		Ma		Avg %	Diff	A Max	% Di	Cert Date	1/20/202	_ !1 Cor	rCoff	1.0	0000	
primary 1 0.32 0.29 0.51 ppb 0.22	0.0%		0.0%											
Primary 2	UseDescription	C	ConcGroup			Tf			Site Unit	RelPe	Dif	AbsDif		
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 Audit Pressure Condition 677.8 mmHg 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 Sample Train Condition True Status pass Sensor Component Inlet Filter Condition Condition Condition Condition True Status pass Sensor Component Fullet Filter Condition C		4	1											
primary 4 65.46 65.23 64.39 ppb -1.3 primary 5 114.13 113.75 113.30 ppb -0.4 Sensor Component Audit Pressure Condition 677.8 mmHg 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 Inlet Filter Condition Condition Clean Status pass Sensor Component Offset Condition In Status pass Sensor Component Span Condition In 1.1 Status pass Sensor Component Zero Voltage Condition N/A Status pass Sensor Component Cell A Freq. Condition 83.5 kHz Status pass Sensor Component Cell A Pressure Condition 651.0 mmHg Status pass Sensor Component Cell A Tmp. Condition 61.9 Status pass Sensor Component Cell A Tmp. Condition 651.0 mmHg Status pass		+									1.00	-0.33		
Sensor Component Audit Pressure Condition G77.8 mmHg Status pass		+		_										
Sensor Component Audit Pressure Condition 677.8 mmHg Status pass Sensor Component 26.6 degree unobstructed rule Condition True Status pass Sensor Component ADT <100 vehicles further than 2		+												
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					4.13	<u> </u> 1			ррь	Ct. 4				
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 Span Condition 1.026 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 0.6 ppb Status pass Sensor Component Cell A Flow Condition 651.0 mmHg Status pass Sensor Component Cell A Tmp. Condition 31.9 C 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 -1.1 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 0.6 ppb Status pass Sensor Component Cell A Flow Condition 651.0 mmHg Status pass Sensor Component Cell A Tmp. Condition 31.9 C Status pass	•		-				Condition	on 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 -1.1 Status pass Sensor Component Span Condition N/A Status pass Sensor Component Fullscale Voltage Condition N/A Status pass Sensor Component Cell A Freq. Condition 0.6 ppb Status pass Sensor Component Cell A Flow Condition 0.67 lpm Status pass Sensor Component Cell A Pressure Condition 651.0 mmHg Status pass Sensor Component Cell A Tmp. Condition 31.9 C Status pass	Sensor Compo	nent	Tree dewlin	e >10m	or belo	w inlet	Condition	on True		Status	pass			
Sensor Component Sample Train Condition Good Status pass Sensor Component Inlet Filter Condition Condition Clean Status pass Sensor Component Offset Condition -1.1 Status pass Sensor Component Span Condition N/A Status pass Sensor Component Fullscale Voltage Condition N/A Status pass Sensor Component Cell A Freq. Condition 83.5 kHz Status pass Sensor Component Cell A Noise Condition 0.6 ppb Status pass Sensor Component Cell A Flow Condition 651.0 mmHg Status pass Sensor Component Cell A Tmp. Condition 31.9 C Status pass	Sensor Compo	nent	ADT <100 v	ehicles/	further	than 2	Condition	on True		Status	pass			
Sensor Component Inlet Filter Condition Condition Clean Status pass Sensor Component Offset Condition -1.1 Status pass Sensor Component Span Condition 1.026 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 83.5 kHz Status pass Sensor Component Cell A Noise Condition 0.6 ppb Status pass Sensor Component Cell A Flow Condition 651.0 mmHg Status pass Sensor Component Cell A Tmp. Condition 31.9 C Status pass	Sensor Compo	Component ADT >100 vehicles further than 5 Condition True			Status	pass								
Sensor Component Offset Condition -1.1 Status pass Sensor Component Span Condition 1.026 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 83.5 kHz Status pass Sensor Component Cell A Noise Condition 0.6 ppb Status pass Sensor Component Cell A Flow Condition 651.0 mmHg Status pass Sensor Component Cell A Tmp. Condition 31.9 C Status pass	Sensor Compo	nent	Sample Tra	in			Condition	on Good		Status	pass			
Sensor ComponentSpanCondition1.026StatuspassSensor ComponentZero VoltageConditionN/AStatuspassSensor ComponentFullscale VoltageConditionN/AStatuspassSensor ComponentCell A Freq.Condition83.5 kHzStatuspassSensor ComponentCell A NoiseCondition0.6 ppbStatuspassSensor ComponentCell A FlowCondition0.67 lpmStatuspassSensor ComponentCell A PressureCondition651.0 mmHgStatuspassSensor ComponentCell A Tmp.Condition31.9 CStatuspass	Sensor Compo	nent	Inlet Filter (Conditio	n Condit		Condition	on Clean		Status	pass			
Sensor ComponentZero VoltageConditionN/AStatuspassSensor ComponentFullscale VoltageConditionN/AStatuspassSensor ComponentCell A Freq.Condition83.5 kHzStatuspassSensor ComponentCell A NoiseCondition0.6 ppbStatuspassSensor ComponentCell A FlowCondition0.67 lpmStatuspassSensor ComponentCell A PressureCondition651.0 mmHgStatuspassSensor ComponentCell A Tmp.Condition31.9 CStatuspass	Sensor Compo	nent	Offset				Conditio	on -1.1		Status	pass			
Sensor ComponentFullscale VoltageConditionN/AStatuspassSensor ComponentCell A Freq.Condition83.5 kHzStatuspassSensor ComponentCell A NoiseCondition0.6 ppbStatuspassSensor ComponentCell A FlowCondition0.67 lpmStatuspassSensor ComponentCell A PressureCondition651.0 mmHgStatuspassSensor ComponentCell A Tmp.Condition31.9 CStatuspass	Sensor Compo	nent	Span				Condition	on 1.026		Status	pass			
Sensor ComponentCell A Freq.Condition83.5 kHzStatuspassSensor ComponentCell A NoiseCondition0.6 ppbStatuspassSensor ComponentCell A FlowCondition0.67 lpmStatuspassSensor ComponentCell A PressureCondition651.0 mmHgStatuspassSensor ComponentCell A Tmp.Condition31.9 CStatuspass	Sensor Compo	nent	Zero Voltag	е			Condition	on N/A		Status	pass			
Sensor Component Cell A Noise Condition 0.6 ppb Status pass Sensor Component Cell A Flow Condition 0.67 lpm Status pass Sensor Component Cell A Pressure Condition 651.0 mmHg Status pass Sensor Component Cell A Tmp. Condition 31.9 C Status pass	Sensor Compo	nent	Fullscale Vo	oltage			Condition	on N/A		Status	pass			
Sensor Component Cell A Flow Condition 0.67 lpm Status pass Sensor Component Cell A Pressure Condition 651.0 mmHg Status pass Sensor Component Cell A Tmp. Condition 31.9 C Status pass	Sensor Compo	nent	Cell A Freq				Condition	on 83.5 kHz		Status	pass			
Sensor Component Cell A Pressure Condition 651.0 mmHg Status pass Sensor Component Cell A Tmp. Condition 31.9 C Status pass	Sensor Compo	nent	Cell A Nois	е			Condition	0.6 ppb		Status	pass			
Sensor Component Cell A Tmp. Condition 31.9 C Status pass	Sensor Compo	nent	Cell A Flow				Condition	0.67 lpm		Status	pass			
	Sensor Compo	nent	Cell A Pres	sure		Condition 651.0 mmHg			Status pass					
Sensor Component Cell B Fred Condition Q0.0 kHz	Sensor Compo	nent	Cell A Tmp				Condition	on 31.9 C		Status	pass			
Sensor Component Condition 50.0 km2 Status pass	Sensor Compo	nent	Cell B Freq				Condition	on 90.0 kHz		Status	pass			
Sensor Component Cell B Noise Condition 0.6 ppb Status pass	Sensor Compo	nent	Cell B Noise	е			Condition			Status	pass			
Sensor Component Cell B Flow Condition 0.68 lpm Status pass	Sensor Compo	nent	Cell B Flow				Condition	0.68 lpm		Status	pass			
Sensor Component Cell B Pressure Condition 650.7 mmHg Status pass	Sensor Compo	nent	Cell B Pres	sure			Condition	0n 650.7 mmHg		Status	pass			
Sensor Component System Memo Condition Status pass	Sensor Compo	nent	System Me	mo			Condition	on		Status	pass			

Temperature Data Form Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg RM Young PAL190 Martin Valvur 10/06/2021 Temperature 06303 12542 Mfg Fluke Parameter Temperature Tfer Desc. RTD 3275143 **Serial Number** 01229 Tfer ID -0.00824 **Slope** 0.99975 **Intercept DAS 1: DAS 2: Cert Date** 2/9/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err CorrCoff 0.07 0.14 UseDesc. InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference Test type primary Temp Low Range 0.12 0.13 0.0000.1 C -0.04C Temp Mid Range 25.02 25.03 0.000 25.0 -0.03 primary 48.19 0.000 C primary Temp High Range 48.21 48.4 0.14 Status pass Sensor Component Shield **Condition** Clean **Condition** N/A Status pass **Sensor Component** Blower Sensor Component Properly Sited **Condition** Properly sited Status pass Sensor Component System Memo Status pass **Condition**

Shelter Temperature Data For Mfg **Serial Number Tag Site Technician** Site Visit Date Parameter **Owner ID** Martin Valvur Campbell 10755-148 PAL190 10/06/2021 Shelter Temperature none **DAS 1: DAS 2:** Parameter Shelter Temperature Mfg Fluke Abs Avg Err Abs Max Err **Abs Avg Err Abs Max Err** Tfer Desc. RTD 3275143 **Serial Number** 0.23 0.43 01229 Tfer ID -0.00824 **Slope** 0.99975 Intercept 2/9/2021 1.00000 **Cert Date** CorrCoff OSE Unit Difference UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng primary Temp Mid Range 25.06 25.07 0.00025.3 \mathbf{C} 0.23 C Temp Mid Range 25.31 25.32 0.00025.3 -0.02 primary

0.000

25.6

C

Status pass

0.43

25.19

Condition

25.18

primary

Temp Mid Range

Sensor Component System Memo

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

Shelter Make	Shelter Model	Shelter Size
Shelter One	E-8109-26012-2	720 cuft

Sensor Component	Sample Tower Type	Condition	Туре В	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 Visit Date 10/06/2021 PAL190 Technician | Martin Valvur Site ID Fortress Cliff **USGS Map EPA** Site Sponsor (agency) Map Scale TX A&M University **Operating Group Map Date** 48-381-9991 AQS# R.M. Young **Meteorological Type** Air Pollutant Analyzer Ozone **QAPP** Latitude dry, wet **QAPP** Longitude **Deposition Measurement Land Use** agriculture **QAPP Elevation Meters** Complex Terrain **QAPP Declination** Marginally Conforms to MLM **OAPP Declination Date** 34.88061 **Site Telephone Audit Latitude** -101.664703 Site Address 1 **Audit Longitude** Site Address 2 **Audit Elevation** 1053 Randall 6.6 **County Audit Declination** Canyon, TX City, State **Present** Fire Extinguisher 79015 No inspection date Zip Code Central First Aid Kit Time Zone **Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **Climbing Belt** Primary Op. E-mail **V Backup Operator Security Fence V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail **Shelter Working Room** ✓ **Make** Model E-8109-26012-2 Shelter One **Shelter Size** 720 cuft **✓** Notes **Shelter Clean** The shelter is in good condition. **✓** Notes Site OK From I27 take exit 99 and go east on Hungate road to the first stop sign. Turn right (south) onto Eastern which is a **Driving Directions** 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.

Fi	eld Systems Data Form		F-02058-1500-S3-rev00					
Site	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					
	ovide any additional explanation (photograph or sketch if neces ural or man-made, that may affect the monitoring parameters		y) regarding conditions listed above, or any other features,					

The meteorological tower and sensors have been removed.

Fic	eld 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?	V	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?	✓	
	ide any additional explanation (photograph or sketch if necesseal or man-made, that may affect the monitoring parameters:	sary)	regarding conditions listed above, or any other features,
The t	emperature signal cable is showing signs of wear.		

DAL 400			40/00/0004
PAL190 Techr	nician Martin Valvur		Site Visit Date 10/06/2021
ting Criteria: Are the pollutant analy	zers and deposition ed	<u> uipr</u>	nent sited in accordance with 40 CFR 58, Appendix E
o the sample inlets have at least a 270 prestricted airflow?	degree arc of	✓	
re the sample inlets 3 - 15 meters abo	ve the ground?	✓	
re the sample inlets > 1 meter from a ad 20 meters from trees?	ny major obstruction,	✓	
ollutant analyzers and deposition equ	ipment operations and	l mai	intenance
o the analyzers and equipment appeandition and well maintained?	r to be in good	✓	
re the analyzers and monitors operat porting data?	ional, on-line, and	✓	
escribe ozone sample tube.			1/4 teflon by 15 meters
escribe dry dep sample tube.			3/8 teflon by 15 meters
re in-line filters used in the ozone san dicate location)	aple line? (if yes	✓	At inlet only
re sample lines clean, free of kinks, mostructions?	oisture, and	✓	
the zero air supply desiccant unsatu	rated?	✓	
re there moisture traps in the sample	lines?	✓	Flow line only
there a rotometer in the dry depositiean?	on filter line, and is it	✓	Clean and dry
	ting Criteria: Are the pollutant analy the sample inlets have at least a 270 trestricted airflow? The the sample inlets 3 - 15 meters about the sample inlets > 1 meter from and 20 meters from trees? The analyzers and deposition equal to the analyzers and equipment appear and tion and well maintained? The the analyzers and monitors operate porting data? The scribe ozone sample tube. The in-line filters used in the ozone sandicate location) The sample lines clean, free of kinks, mustructions? The there moisture traps in the sample tree there moisture traps in the sample traps.	PAL190 Technician Martin Valvur ting Criteria: Are the pollutant analyzers and deposition expected airflow? The the sample inlets have at least a 270 degree arc of airestricted airflow? The the sample inlets 3 - 15 meters above the ground? The the sample inlets > 1 meter from any major obstruction, d 20 meters from trees? The the analyzers and deposition equipment operations and the analyzers and equipment appear to be in good andition and well maintained? The the analyzers and monitors operational, on-line, and porting data? The scribe ozone sample tube. The in-line filters used in the ozone sample line? (if yes dicate location) The sample lines clean, free of kinks, moisture, and structions? The there moisture traps in the sample lines?	Technician Martin Valvur ting Criteria: Are the pollutant analyzers and deposition equipment of the sample inlets have at least a 270 degree arc of crestricted airflow? The the sample inlets 3 - 15 meters above the ground? The the sample inlets > 1 meter from any major obstruction, with a degree and deposition equipment operations and main of the analyzers and deposition equipment operations and main of the analyzers and equipment appear to be in good and indition and well maintained? The the analyzers and monitors operational, on-line, and porting data? The secribe ozone sample tube. The in-line filters used in the ozone sample line? (if yes dicate location) The sample lines clean, free of kinks, moisture, and structions? The zero air supply desiccant unsaturated?

Field Systems Data Form

F-02058-1500-S6-rev002

DAS, sensor translators, and peripheral equipment operations and maintenance 1 Do the DAS instruments appear to be in good condition and well maintained?							
1 Do the DAS instruments appear to be in good condition and well maintained?							
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?							
9 Is the met tower stable and grounded? Stable	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 natural or man-made, that may affect the monitoring parameters:	listed above, or any other features,						

Field Sys	tems Data F	orm	1				F-02	058-	-1500-S7-rev002
Site ID	PAL190	To	echnician	Martin Val	/ur	Site Visit Date	10/06/2021		
D		_							
Documenta									
Does the sit	e have the required				t manuals?				
Wind speed se Wind direction Temperature se Relative humic Solar radiation Surface wetner Wind sensor to Temperature of Humidity sense Solar radiation Tipping bucket Ozone analyze Filter pack flo	n sensor sensor dity sensor n sensor ss sensor ranslator translator or translator n translator et rain gauge				Shelter he	er t recorder ump pump tector protection device	Yes	No V	
Filter pack Ml	FC power supply								
Does the s	ite have the require	d and	most rece	nt QC docı	ıments and	report forms?			
	Pi	resent					Curre	nt	
Station Log		✓					✓		
SSRF		✓					✓		
Site Ops Manu	ıal	✓	Oct 201	4			✓		
HASP		✓	Oct 201	4			✓		
Field Ops Man	nual		Oct 201				✓		
Calibration Ro	eports	✓	Electro	nic copy			✓		
Ozone z/s/p Co	ontrol Charts			.,					
Preventive ma	intenance schedule								
1 Is the stat	tion log properly co	mplete	ed during	every site v	risit? ✓				
2 Are the S current?	ite Status Report Fo	rms b	eing comp	oleted and	✓				
	hain-of-custody formation to the land from lan		perly used	d to docum	ent 🗸				
4 Are ozone current?	e z/s/p control chart	s prop	erly comp	leted and		Control charts not u	sed		
	dditional explanation n-made, that may af					regarding condit	ions listed a	above, c	or any other features,

Field Systems Data Form F-02058-1500-S8-rev002 PAL190 Technician Martin Valvur Site Visit Date 10/06/2021 Site ID Site operation procedures Trained by previous operator Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET Trained on site by MACTEC during site installation training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **~** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** Semiannually **Multipoint Calibrations V V** Weekly **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **Manual Rain Gauge Test V V** Weekly **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? Compliant **OC Check Performed** Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily **V V** As needed Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests V** As needed **Manual Precision Level Test V V** Weekly **Analyzer Diagnostics Tests V** Every 2 weeks **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V V** Weekly Sample Line Check for Dirt/Water **~** Weekly **Zero Air Desiccant Check** Unknown Do multi-point calibration gases go through the complete

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

✓

✓

SSRF

The ozone sample train is leak tested every two weeks.

complete sample train including all filters?

Do automatic and manual z/s/p gasses go through the

Are the automatic and manual z/s/p checks monitored and

sample train including all filters?

reported? If yes, how?

Fi	eld Sy	stems Data Form			F-02058-1500-S9-rev00				
Site	e ID	PAL190 Te	chnician Martin Valvur		Site Visit Date	10/06/2021			
	Site ope	ration procedures							
1	Is the fil	ter pack being changed eve	ry Tuesday as scheduled	V	Filter changed mor	inings			
2	Are the correctly	Site Status Report Forms b	eing completed and filed	✓					
3	Are data	a downloads and backups b ed?	eing performed as		No longer required				
4	Are gen	eral observations being mad	le and recorded? How?	✓	SSRF, logbook				
5	Are site fashion?	supplies on-hand and reple	nished in a timely	✓					
6	Are sam	ple flow rates recorded? Ho	ow?	✓	SSRF				
7	Are sam	ples sent to the lab on a reg	ular schedule in a timely	✓					
8		rs protected from contaminoping? How?	ation during handling	✓	Clean gloves on ar	nd off			
9		site conditions reported reg ons manager or staff?	ularly to the field	✓					
QC	Check Po	erformed	Frequency			Compliant			
N	Multi-poir	nt MFC Calibrations	✓ Semiannually			✓			
F	Flow Syste	em Leak Checks	✓ Weekly			\checkmark			
I	Filter Pac	k Inspection							
I	Flow Rate	Setting Checks	✓ Weekly			\checkmark			
1	Visual Ch	eck of Flow Rate Rotometer	✓ Weekly			\checkmark			
I	In-line Filter Inspection/Replacement As needed				✓				
S	Sample Li	ne Check for Dirt/Water	Weekly			✓			
		dditional explanation (phot n-made, that may affect the			y) regarding condit	ions listed above, or any other fea	tures,		

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	В	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
DEN	N417 - Martii	n 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 Numbe	er Ta Site		Tec	chnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElectron Inc	49C-77033-38	B4 DEN417	,	Ma	artin Valvur	10/12/2021	Ozone		90778
Intercept 0	.00000 Cor	rcept 0	0.00000		Mfg Serial Number Tfer ID	ThermoElectror 49CPS-70008-3 01110	364 Tf	er Des	ozone c. Ozone primary stan
A Avg % Diff: A M		Avg %Diff A	Max %	⁄ ₆ Di	Slope	1.0034		rcept	0.02230
0.0%	0.0%				Cert Date	1/20/20	21 Cori	rCoff	1.00000
UseDescription	ConcGroup	Tfer Raw	Tfe	er Corr	Site	Site Unit	RelPer	Dif	AbsDif
primary	1	0.02	(0.00	0.81	ppb			0.81
primary	2	15.10	1	5.03	15.98	ppb			0.95
primary	3	35.30	3	5.16	36.32	ppb		3.25	
primary	4	65.73	6	55.50	66.57	ppb		1.62	
primary	5	110.74	1	10.37	111.70	ppb		1.2	
Sensor Componer	Audit Pressi	ure		Conditio	687.5 mmHg		Status	pass	
Sensor Componer	26.6 degree	unobstructed ru	le	Conditio	True		Status	pass	
Sensor Componer	Tree dewline	e >10m or below	inlet	Conditio	True		Status	pass	
Sensor Componer	ADT <100 v	ehicles further th	an 2	Conditio	130 m		Status	Fail	
Sensor Componer	ADT >100 v	ehicles further th	an 5	Conditio	130 m		Status	Fail	
Sensor Componer	Sample Trai	in		Conditio	Good		Status	pass	
Sensor Componer	Inlet Filter C	ondition		Condition	Clean		Status	pass	
Sensor Componer	Offset			Conditio	on -1.0		Status	pass	
Sensor Componer	Span			Conditio	1.008		Status	pass	
Sensor Componer	Zero Voltage	е		Conditio	0.0002		Status	pass	
Sensor Componer	Fullscale Vo	ltage		Conditio	1.0001		Status	pass	
Sensor Componer	Cell A Freq.			Conditio	74.8 kHz		Status	pass	
Sensor Componer	Cell A Noise)		Conditio	0.6 ppb		Status	pass	
Sensor Componer	Cell A Flow			Condition	0.6 lpm		Status	pass	
Sensor Componer	Cell A Press	sure		Condition	676.3 mmHg		Status	pass	
Sensor Componer	Cell A Tmp.			Condition	35.3 C		Status	pass	
Sensor Componer	Cell B Freq.			Condition	60.2 kHz		Status	pass	
Sensor Componer	Cell B Noise	;		Condition	0.8 ppb		Status	pass	
Sensor Componer	Cell B Flow			Condition	0.60 lpm		Status	pass	
Sensor Componer	Cell B Press	sure		Condition	675.8 mmHg		Status	pass	
Sensor Componer	System Mer	mo		Conditio	on		Status	pass	

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BVL	130-Korey	Devins-10/13/2021				
1	10/13/2021	СО	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	В	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 **Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Campbell 2111 BVL130 Korey Devins 10/13/2021 DAS Primary Das Date: 10/14/2021 **Audit Date** 10/14/2021 Datel Parameter DAS Mfg 09:57:00 09:57:01 Das Time: **Audit Time** Tfer Desc. Source generator (D 15510194 **Serial Number** 287 Das Day: **Audit Day** 287 01320 Tfer ID **Low Channel: High Channel: Avg Diff: Avg Diff: Max Diff:** Max Diff: 0.00000 1.00000 Slope **Intercept** 0.0000 0.0001 0.0000 0.0001 2/13/2012 1.00000 **Cert Date** CorrCoff Fluke **Parameter** DAS Mfg **Serial Number** 95740135 Tfer Desc. DVM 01311 Tfer ID 1.00000 0.00000 Slope **Intercept** 2/11/2021 1.00000 **Cert Date** CorrCoff Channel Input **DVM** Output DAS Output InputUnit OutputUnit Difference 0.0000 0.0000 0.0000 0.0000 0.0999 0.0999 V V 7 0.1000 0.00007 0.3000 0.2998 0.2998 V V 0.00007 0.5000 0.4996 0.4997 V V 0.00017 0.7000 0.6996 0.6996 V V 0.0000 7 V V 0.9000 0.8994 0.8995 0.00017 1.0000 0.9993 0.9994 V V 0.0001

Flow Data Form

fg	Serial Nun	iber Ta S	ite	Tec	hnician	Site Visit I	Oate Paran	ieter	Owner ID
pex	illegible		BVL130	Koı	rey Devins	10/13/2021	Flow R	Rate	000529
					Mfg	BIOS	P	arameter FI	ow Rate
					Serial Number	131818	Т	fer Desc. B	OS 220-H
					Tfer ID	01417			
					Slope	0	99756 Into	ercept	-0.00058
					•				
					Cert Date	2/10	0/2021 Co	rrCoff	0.9999
OAS 1:		DAS 2:		_	Cal Factor Z	ero	0.00	09	
Avg % Diff:	A Max % Di	A Avg %I	Diff A Max	% Di	Cal Factor F	ull Scale	1.0	02	
0.89%	1.33%				Rotometer R	eading:	1	.4	
Desc.	Test type	Input 1/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSigna	ll PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.01	1/m	1/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.02	1/m	1/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	1/m	l/m	0.67%
primary	test pt 3	1.496	1.500	1.49	0.000	1.52	1/m	l/m	1.33%
Sensor Compo	nent Leak Tes	t		Condition	n		Status	pass	
Sensor Compo	nent Tubing C	ondition		Condition	Good		Status	pass	
Sensor Comp	onent Filter Pos	sition		Condition	Good		Status	pass	
Sensor Comp	onent Rotomete	er Condition		Condition	Clean and dry		Status	pass	
Sensor Compo	onent Moisture	Present		Condition	See comments	3	Status	pass	
Sensor Compo	onent Filter Dist	tance		Condition	2.5 cm		Status	pass	
Sensor Compo	onent Filter Dep	oth		Condition	2.0 cm		Status	pass	
Sensor Compo	onent Filter Azii	muth		Condition	205 deg		Status	pass	
Sensor Comp	onent System N	/lemo		Condition	n		Status	pass	

Ozone Data Form

Mfg	Serial Numbe	er Ta Site		Te	chnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElectron Inc	1105347318	BVL130)	Ko	orey Devins	10/13/2021	Ozone		000739
Intercept -0		rcept	0.0000	0	Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114			ozone Ozone primary stan
DAS 1: A Avg % Diff: A M 0.0%		AS 2: Avg %Diff A	Max '	% Di	Slope Cert Date	1.0003		cept Coff	0.30550
UseDescription	ConcGroup	Tfer Raw	Tf	fer Corr	Site	Site Unit	RelPer	Dif	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	1	110.52	109.70	ppb		-0.74	
Sensor Componer	Audit Press	ure		Condition	740.5 mmHg		Status	pass	
Sensor Componer	26.6 degree	unobstructed ru	ıle	Condition	True		Status	pass	
Sensor Componer	Tree dewlin	e >10m or below	/ inlet	Condition	True		Status	pass	
Sensor Componer	ADT <100 v	ehicles further the	nan 2	Condition	On True		Status	pass	
Sensor Componer	ADT >100 v	ehicles further the	nan 5	Condition	on True		Status	pass	
Sensor Componer	Sample Tra	in		Condition	Good		Status	pass	
Sensor Componer	Inlet Filter C	ondition		Condition	Clean		Status	pass	
Sensor Componer	offset			Condition	0.000		Status	pass	
Sensor Componer	Span				on 1.008		Status	pass	
Sensor Componer	Zero Voltag	e		Condition	on N/A		Status		
Sensor Componer				Condition			Status		
Sensor Componer					on 89.2 kHz		Status		
Sensor Componer				Condition	0.6 ppb		Status		
Sensor Componer				Condition	0.63 lpm		Status	pass	
Sensor Componer		sure			718.4 mmHg		Status		
Sensor Componer					36.1 C		Status		
Sensor Componer					on 90.8 kHz		Status		
Sensor Componer					0.3 ppb		Status		
Sensor Componer					0.72 lpm		Status		
Sensor Componer		sure			719.3 mmHg		Status		
Sensor Componer				Condition			Status		
STEED COMPONE								Ľ	

Wind Speed Data Form Mfg Serial Number Ta **Technician** Site Visit Date Parameter Owner ID BVL130 Wind Speed 04666 RM Young 61085wsp Korey Devins 10/13/2021 RM Young Parameter wind speed Mfg CA04013 Tfer Desc. wind speed motor (h **Serial Number** 01255 Tfer ID 1.00000 0.00000 **Slope Intercept** 71566 Prop or Cups SN 0.3 **to** 0.4 Prop or Cups Torque 1.00000 **Cert Date** 6/14/2021 CorrCoff **Prop Correction Facto** 0.0512 **DAS 1: DAS 2:** Low Range Low Range **High Range High Range** 0.05 0.00% Abs Avg Err 0.20 0.00% Abs Max Err Out V UseDescription: Input Device Input RPM Input m/s DAS m/s Diff/ %Diff Diff WsM 0 0.20 0.0 0.0 -0.20 primary none 01255 200 1.02 0.0 1.0 0.00 primary 01255 400 2.05 0.0 2.1 0.00 primary 4.1 01255 800 4.10 0.0 0.00 primary 0.0 6.1 0.00% primary 01255 1200 6.14 12.29 0.0 2400 12.3 0.00% primary 01255 primary 4000 20.48 0.0 20.5 0.00% 9400 48.13 48.1 0.00%0.0 primary **Condition** Good Sensor Component | Condition Status pass Sensor Component Prop or Cups Condition **Condition** Good Status pass Sensor Component | Sensor Heater **Condition** N/A Status pass Status pass **Condition** Good **Sensor Component** Torque 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 Status pass Condition

Wind Direction Data Form Serial Number Ta **Technician** Site Visit Date Parameter **Owner ID** Mfg BVL130 Wind Direction 61085wdr Korey Devins 10/13/2021 04666 RM Young Mfg RM Young Parameter wind direction None Tfer Desc. wind direction wheel **Serial Number** 01458 Tfer ID 1.00000 0.00000 **Slope** Intercept N/A Vane SN: C. A. Align. deg. true: 30 **to** 40 VaneTorque 1/1/2017 1.00000 **Cert Date** CorrCoff Ushikata Parameter wind direction Mfg **Serial Number** 191832 Tfer Desc. transit 01272 Tfer ID 1.00000 0.00000 **Slope** Intercept **Cert Date** 2/9/2021 CorrCoff 1.00000 **DAS 1: DAS 2:** Orientation Orientation **Linearity: Linearity:** 7.0 1.8 Abs Avg Err 9 5 Abs Max Err UseDescription TferID Input Raw Linearity Output V Output Deg. Difference Change Error 01458 **✓** 0.000 46.8 ########### primary 0 0 0 45 **V** 0.000 1 primary 01458 44 43.6

primary	01458	45	lacksquare	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 Compone	ent Sensor Heate	r	Cond	ition N/A		Status	pass	
Sensor Compone	ent Condition		Cond	ition Good		Status	pass	
Sensor Compone	ent Sensor Plumb)	Cond	ition Plumb		Status	pass	
Sensor Compone	ent Mast		Cond	ition Good		Status	pass	
Sensor Compone	ent Torque		Cond	ition Fair		Status	pass	
Sensor Compone	ent Vane Condition	on	Cond	ition Good		Status	pass	
Sensor Compone	50m from tree	dripline	Cond	ition True		Status	pass	
Sensor Compone	ent obstacles >10	x height above se	ns Cond	ition True		Status	pass	
Sensor Compone	System Memo)	Cond	ition See comm	nents	Status	pass	

Temperature Data Form Serial Number Ta Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Korey Devins 04690 RM Young 6704 BVL130 10/13/2021 Temperature Parameter Temperature Mfg Extech Tfer Desc. RTD H232734 **Serial Number** 01227 Tfer ID 1.00743 0.21666 **Slope** Intercept **DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 0.12 0.22 OutputTmpSignal OutputSignalEng OSE Unit Difference UseDesc. Test type InputTmpRaw InputTmpCorr. primary Temp Low Range 0.34 0.12 0.0000.20 \mathbf{C} 0.08 29.73 29.30 29.23 С -0.07 Temp Mid Range 0.000primary 45.54 0.00045.32 C -0.22 primary Temp High Range 46.10 Condition Clean Sensor Component | Shield Status pass Status pass Sensor Component Blower **Condition** Functioning Condition Properly sited Status pass **Sensor Component** Properly Sited Sensor Component | System Memo Status pass Condition

2 Meter Temperature Data Form Calc. Difference Serial Number Ta Site **Technician** Site Visit Date Parameter **Owner ID** Mfg BVL130 Korey Devins 10/13/2021 Temperature2meter 07287 RM Young 031778 Mfg Extech **Parameter** Temperature H232734 Tfer Desc. RTD **Serial Number** 01227 Tfer ID **Slope** 1.00743 Intercept 0.21666 **DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 0.14 0.27 Test type UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit | Difference 0.000 primary Temp Low Rang 0.34 0.12 0.20 C 0.08 0.000 Temp Mid Rang 29.73 29.30 29.22 C -0.08 primary -0.27 primary Temp High Rang 46.10 45.54 0.00045.27 C 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 Status pass Condition

Humidity Data Form Mfg Serial Number Ta **Technician** Site Visit Date Parameter **Owner ID** Site Vaisala BVL130 Korey Devins 10/13/2021 Relative Humidity 06754 E1140035 Mfg AZ Instruments Parameter Relative Humidity Tfer Desc. Psychrometer 10325189 **Serial Number** 01223 Tfer ID -1.94680 **Slope** 1.01102 **Intercept** 2/9/2021 1.00000 **Cert Date** CorrCoff **DAS 1: DAS 2:** Low Range: **High Range** Low Range: **High Range** 1.5 2.6 Abs Avg Err 2.8 2.6 Abs Max Err UseDesc. Test type Device Input RH GTL Raw RH Corr. DAS Volts DAS %RH Difference RH Low Range 32.2 0.000 -0.2 primary Psychrometer 32.8 32.8 32.6 RH Low Range 52.9 51.3 52.9 0.0002.8 primary Psychrometer 55.7 0.000 primary RH High Range Psychrometer 99.1 99.1 99.1 96.5 -2.6 Condition Clean Status pass Sensor Component | RH Filter 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 Status pass Condition

Precipitation Data Form

Mfg	S	erial N	lumber Ta	Site		Tec	chnician		Site	Visit Date	Paramo	eter		Owner ID	
Texas Electron	nics	llegible		BVL130		Ko	rey Devins		10/	13/2021	Precipit	atior	า	06334	
							Mfg		PMF)	Pa	ram	neter Pi	recipitation	
DAS 1:			DAS 2:				Serial Num	ıber	Non	Э	Tf	er D	esc. 25	50ml graduate	
A Avg % Diff 1.0%		x % D 2.0		Diff A N	/lax % Di		Tfer ID		0124	19					
							Slope			1.0000	0 Inter	rcep	ot	0.0000	0
							Cert Date			4/26/201	3 Cori	rCof	ff	1.0000	0
UseDesc.	Test t	type	TferVolume	Iteration	TimePerT	ip	Eq.Ht	DAS	Seng	Eq.HtUnit	OSE Ur	nit]	ΓferUni	ts PctDifferenc	e
primary	test 1		231.5	1	10 sec		0.50		51	in	in		ml	2.0%	-
primary	test 2		231.5	2	10 sec		0.50	0.	50	in	in		ml	0.0%	ó
Sensor Com	ponent	Prope	rly Sited		Cond	litio	n 45 degree	e rule			Status	Fail	l		
Sensor Com	ponent	Gauge	e Drain Scree	n	Cond	litio	nstalled				Status	pas	S		
Sensor Com	ponent	Funne	el Clean		Cond	litio	n Moderate	ly cle	an		Status	pas	ss		
Sensor Com	ponent	Condi	tion		Cond	litio	n Good				Status	pas	S		
Sensor Com	ponent	Gauge	e Screen		Cond	litio	n Installed				Status	pas	s		
Sensor Com	ponent	Gauge	e Clean		Cond	litio	n Moderate	ly cle	an		Status	pas	ss		
Sensor Com	ponent	Level			Cond	litio	n Level				Status	pas	ss		
Sensor Com	ponent	Senso	r Heater		Cond	litio	n Functioni	ng			Status	pas	ss		
Sensor Com	ponent	Syste	m Memo		Cond	litio	n				Status	pas	ss		

Solar Radiation Data Form Serial Number Ta **Technician** Site Visit Date Parameter **Owner ID** Mfg PY10653 BVL130 Korey Devins 10/13/2021 Solar Radiation 04566 Licor Mfg Eppley Parameter solar radiation RM Young Mfg Tfer Desc. SR transfer sensor 34341F3 **Serial Number** 04340 **SN/Owner ID** none 01245 Tfer ID Solar Radiation Translator **Parameter** 1.00000 0.00000 **Slope Intercept DAS 1: DAS 2:** 2/3/2021 1.00000 % Diff of Avg %Diff of Max %Diff of Avg %Diff of Max **Cert Date** CorrCoff 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 10/14/2021 90 7.3% 09:00 84 84 primary 157 3.1% primary 10/14/2021 10:00 152 152 0.8% primary 10/14/2021 11:00 238 238 240 104 104 111 6.3% primary 10/14/2021 12:00 10/14/2021 13:00 148 148 157 6.4% primary 8.1% 10/14/2021 14:15 142 142 154 primary 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

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

✓ 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 BVL130 Korey Devins 10/13/2021 Shelter Temperature none unknown **DAS 1: DAS 2:** Parameter Shelter Temperatur Mfg Extech Abs Avg Err Abs Max Err Abs Avg Err **Abs Max Err** Tfer Desc. RTD H232734 **Serial Number** 0.32 0.59 01227 Tfer ID 1.00743 0.21666 **Slope** Intercept 2/18/2021 1.00000 CorrCoff**Cert Date**

primary Temp Mid Range 25.70 25.30 0.000 25.9 primary Temp Mid Range 27.43 27.01 0.000 26.8	0.59
primary Temp Mid Range 27.43 27.01 0.000 26.8	2 0.15
	C -0.17
primary Temp Mid Range 26.49 26.08 0.000 26.3	0.21
Sensor Component System Memo Condition Status pass	

Siting Criteria Form

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	

The state of the s					
Sensor Component Sar	imple Tower Type	Condition	Type B	Status	pass
Sensor Component Cor	onduit	Condition	Good	Status	pass
Sensor Component Met	et Tower	Condition	Good	Status	pass
Sensor Component Moi	pisture Trap	Condition	Installed	Status	pass
Sensor Component Moi	pisture Trap Type	Condition	Glass bottle and filter	Status	pass
Sensor Component Pov	wer Cables	Condition	Good	Status	pass
Sensor Component She	elter Temp Control	Condition	Functioning	Status	pass
Sensor Component Rot	otometer	Condition	Installed	Status	pass
Sensor Component Sar	imple Tower	Condition	Good	Status	pass
Sensor Component She	elter Condition	Condition	Fair	Status	pass
Sensor Component She	elter Door	Condition	Fair	Status	pass
Sensor Component She	elter Roof	Condition	Good	Status	pass
Sensor Component She	elter Floor	Condition	Fair	Status	pass
Sensor Component She	elter walls	Condition	Good	Status	pass
Sensor Component Exc	cessive mold present	Condition	Good	Status	pass
Sensor Component Sign	gnal Cable	Condition	Fair	Status	pass
Sensor Component Tub	bing Type	Condition	3/8 teflon	Status	pass
Sensor Component Sar	imple Train	Condition	Good	Status	pass
Sensor Component Sys	stem 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	Δnev	4033		
The filter sample tub		,			Прех	4033		
Wind Direction	BVL130	Korey Devins	10/13/2021	Orientation	RM Young	3188		
The wind direction of	orientation is outsic	le the acceptance lim	nit of 5 degrees.	This is due to a com	bined error fron	n the crossarm ali	gnment 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 Visit Date 10/13/2021 BVL130 Technician Korey Devins Site ID Bondville **USGS Map EPA** Site Sponsor (agency) Map Scale ISWS **Operating Group Map Date** 17-019-1001 AQS# Climatronics Meteorological Type Ozone, IMPROVE 40.0520 **Air Pollutant Analyzer QAPP** Latitude dry, wet, Hg **QAPP** Longitude -88.3725 **Deposition Measurement** 212 Land Use agricultural **QAPP Elevation Meters** flat -2.1 **Terrain QAPP Declination** 9/16/2005 Yes Conforms to MLM **OAPP Declination Date** (217) 863-2602 40.052021 Site Telephone **Audit Latitude** Bondville Road Research Station -88.372481 Site Address 1 **Audit Longitude** Site Address 2 **Audit Elevation** 213 Champaign -3.3 **County Audit Declination** Seymour, IL City, State **Present** Fire Extinguisher 61875 New in 2015 Zip Code Central **First Aid Kit** Time Zone **Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **V Climbing Belt** Primary Op. E-mail **Backup Operator Security Fence V Secure Shelter** Backup Op. Phone # Stable Entry Step Backup Op. E-mail **Shelter Working Room** ✓ **Make** Model 8810 (s/n 2140-1) Ekto **Shelter Size** 640 cuft **✓** Notes The shelter still smells like rodent excrement. The shelter door does not completely seal and water Shelter Clean enters during heavy rain. The water has caused damage to the floor. **✓** Notes Site OK

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

Driving Directions

is visible in the field on the right.

Fi	eld Systems Data Form	F-02058-1500-S3-rev002
Site	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?	
	ovide any additional explanation (photograph or sketch if nece ural or man-made, that may affect the monitoring parameters	ssary) regarding conditions listed above, or any other features,

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

eld S	ystems Data	Form		F-02058-1500-S4-rev002
e ID	BVL130	Technician Korey Devins		Site Visit Date 10/13/2021
			✓	
		sensors operational online, and	✓	
Are th	e shields for the tem	perature and RH sensors clean?	✓	
Are th	e aspirated motors v	working?	✓	
		or's lens clean and free of	✓	
Is the	surface wetness sens	or grid clean and undamaged?	✓	
				Signs of wear
			V	
				regarding conditions listed above, or any other features,
	Do all condition Are all reports Are the secret of the sec	Do all the meterological secondition, and well maintate Are all the meteorological reporting data? Are the shields for the temester Are the aspirated motors of the solar radiation sense scratches? Is the surface wetness sense Are the sensor signal and condition, and well maintate Are the sensor signal and from the elements and well wide any additional explanational or man-made, that may	Do all the meterological sensors appear to be intact, in good condition, and well maintained? Are all the meteorological sensors operational online, and reporting data? Are the shields for the temperature and RH sensors clean? Are the aspirated motors working? Is the solar radiation sensor's lens clean and free of scratches? Is the surface wetness sensor grid clean and undamaged? Are the sensor signal and power cables intact, in good condition, and well maintained? Are the sensor signal and power cable connections protected from the elements and well maintained?	Do all the meterological sensors appear to be intact, in good condition, and well maintained? Are all the meteorological sensors operational online, and reporting data? Are the shields for the temperature and RH sensors clean? Are the aspirated motors working? Is the solar radiation sensor's lens clean and free of scratches? Is the surface wetness sensor grid clean and undamaged? Are the sensor signal and power cables intact, in good condition, and well maintained? Are the sensor signal and power cable connections protected from the elements and well maintained? vide any additional explanation (photograph or sketch if necessary) aral or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S5-rev002 BVL130 Technician Korey Devins Site Visit Date 10/13/2021 Site ID Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E **~** Do the sample inlets have at least a 270 degree arc of unrestricted airflow? **~** Are the sample inlets 3 - 15 meters above the ground? **~** Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees? Pollutant analyzers and deposition equipment operations and maintenance **~** Do the analyzers and equipment appear to be in good condition and well maintained? **~** Are the analyzers and monitors operational, on-line, and reporting data? Describe ozone sample tube. 1/4 teflon by 12 meters Describe dry dep sample tube. 3/8 teflon by 12 meters At inlet only Are in-line filters used in the ozone sample line? (if ves indicate location) **~** Are sample lines clean, free of kinks, moisture, and obstructions? **V** Is the zero air supply desiccant unsaturated? flow, SO2, and CO line only Are there moisture traps in the sample lines? Clean and dry 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	BVL130		Technician	Korey Devins		Site Visi	t Date 10/13/202	1	
	DAS 6	ancar translate	ore and n	arinharal aqui	pment operation	ne ar	nd maintana	nca		
	DAD, S	ciisor transiati	ors, and p	cripheral equi	-			<u>nec</u>		
1		DAS instrume aintained?	ents appea	ar to be in good	l condition and	✓				
2		the component, backup, etc)		DAS operation	al? (printers,	✓				
3		analyzer and s		nal leads pass	through	✓	Met sensors	only		
4		e signal connec aintained?	ctions pro	tected from the	e weather and	✓				
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 i	nstrument she	lter temp	erature control	lled?	✓				
9	Is the n	net tower stab	le and gro	ounded?			Stable		Grounded	
							✓		✓	
10	Is the s	ample tower s	table and	grounded?			V		✓	
11	Tower	comments?								
					or sketch if nece		y) regarding	g conditions listed	d above, or a	ny other features,

Field Systems Data Form F-02058-1500-S7-rev002 BVL130 Technician Korey Devins Site Visit Date 10/13/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? Yes No N/A Yes No N/A **V V** Wind speed sensor Data logger **V** ✓ П Wind direction sensor Data logger **V** ✓ П **Temperature sensor** Strip chart recorder **✓** П Relative humidity sensor Computer **V V** Solar radiation sensor Modem **~** П **~** Printer Surface wetness sensor **✓ V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump **V ~ Humidity sensor translator Surge protector** \checkmark **V UPS Solar radiation translator** П **✓ V** Tipping bucket rain gauge **Lightning protection device** ~ **V Shelter heater** Ozone analyzer ~ **✓** 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 V SSRF ✓ V ✓ V Site Ops Manual** May 2019 **V HASP ✓** May 2019 **V** Field Ops Manual **Calibration Reports V ✓** Ozone z/s/p Control Charts Preventive maintenance schedule Is the station log properly completed during every site visit? ✓ Are the Site Status Report Forms being completed and **V** current? Are the chain-of-custody forms properly used to document **✓** sample transfer to and from lab? Control charts not used Are ozone z/s/p control charts properly completed and current? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,

natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S8-rev002 BVL130 Technician Korey Devins Site Visit Date 10/13/2021 Site ID Site operation procedures Trained by previous operator Has the site operator attended a formal CASTNET training ✓ course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **V** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 ✓ V** Semiannually **Multipoint Calibrations V V** Daily **Visual Inspections V** N/A Translator Zero/Span Tests (climatronics) **✓ V** Weekly **Manual Rain Gauge Test ✓ V** Weekly **Confirm Reasonableness of Current Values V V** Weekly **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed Compliant** Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily **V V** As needed Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests V** As needed **Manual Precision Level Test V V** Weekly **Analyzer Diagnostics Tests V** Every 2 weeks **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V V** Weekly Sample Line Check for Dirt/Water **~ V** Weekly **Zero Air Desiccant Check** Unknown Do multi-point calibration gases go through the complete sample train including all filters? **✓** Do automatic and manual z/s/p gasses go through the complete sample train including all filters?

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

✓

SSRF, call-in

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

Are the automatic and manual z/s/p checks monitored and

reported? If yes, how?

Fi	eld Sy	stems Data Form		F-02058-1500-S9-rev002					
Site	e ID	BVL130 Ted	chnician Korey Devins		Site Visit Date	10/13/2021			
	Site ope	eration procedures							
1	Is the fi	lter pack being changed ever	y Tuesday as scheduled?	~	Filter changed mori	nings			
2	Are the	Site Status Report Forms be	ing completed and filed	✓					
3	Are dat	a downloads and backups be ed?	ing performed as		No longer required				
4	Are ger	neral observations being mad	e and recorded? How?	✓	SSRF				
5	Are site	e supplies on-hand and repler?	nished in a timely	✓					
6	Are sar	nple flow rates recorded? Ho	w?	✓	SSRF, call-in				
7	Are sar	nples sent to the lab on a reg ?	ular schedule in a timely	✓					
8		ers protected from contamina pping? How?	ation during handling	✓	Clean gloves on and off				
9		site conditions reported regu ons manager or staff?	ılarly to the field	✓					
QC	Check P	erformed	Frequency			Compliant			
N	Multi-poi	nt MFC Calibrations	✓ Semiannually			✓			
I	Flow Syst	em Leak Checks	✓ Weekly			✓			
I	Filter Pac	ek Inspection							
I	Flow Rat	e Setting Checks	✓ Weekly			✓			
1	Visual Cl	eck of Flow Rate Rotometer	✓ Weekly			✓			
I	In-line Filter Inspection/Replacement Semiannually				✓				
S	Sample L	ine Check for Dirt/Water	✓ Weekly			\checkmark			
		additional explanation (photo an-made, that may affect the		sary	y) regarding conditi	ons listed above, or any other features,			

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	В	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
SPD	111 - Eric H	Jebert-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 Numbe	er Ta Site		Tec	chnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElectron Inc	1105347313	SPD111		Er	ic Hebert	10/15/2021	Ozone		000742
Intercept 0		rcept	0.00000		Mfg Serial Number Tfer ID	ThermoElectror 1180930075 01115			ozone C. Ozone primary sta
DAS 1:	D	AS 2:			Slope	1.0056	30 Inte	rcept	0.14070
A Avg % Diff: A M	ax % Di A	Avg %Diff A	Max %	6 Di	•			-	
0.0%	0.0%				Cert Date	4/7/20	Zi Cori	Coff	0.99990
UseDescription	ConcGroup	Tfer Raw	Tfe	er Corr	Site	Site Unit	RelPer	Dif	AbsDif
primary	1	0.24	(0.09	0.32	ppb			0.23
primary	2	18.44	1	7.96	18.45	ppb			0.49
primary	3	37.73	3	6.89	37.91	ppb		2.73	
primary	4	68.59	6	7.18	68.44	ppb		1.86	
primary	5	104.14	10	02.07	104.20	ppb		2.07	
Sensor Componer	Audit Pressi	ure		Conditio	733.0 mmHg		Status	pass	
Sensor Componer	26.6 degree	unobstructed ru	le	Conditio	True		Status	pass	
Sensor Componer	Tree dewline	e >10m or below	inlet	Conditio	True		Status	pass	
Sensor Componer	ADT <100 v	ehicles further th	an 2	Conditio	True		Status	pass	
Sensor Componer	ADT >100 v	ehicles further th	an 5	Condition	265 m		Status	Fail	
Sensor Componer					Good		Status		
Sensor Componer					on Clean		Status	pass	
Sensor Componer				Conditio			Status		
Sensor Componer					n 1.005		Status	pass	
Sensor Componer		e		Conditio			Status		
Sensor Componer				Condition			Status		
Sensor Componer					94.5 kHz		Status		
Sensor Componer					0.4 ppb		Status		
_									
Sensor Componer					0.66 lpm		Status		
Sensor Componer					694.1 mmHg		Status		
Sensor Componer					38.4 C		Status		
Sensor Componer					122.5 kHz		Status		
Sensor Componer		•			0.6 ppb		Status		
Sensor Componer	Cell B Flow				0.65 lpm		Status	pass	
Sensor Componer	Cell B Press	sure		Conditio	694.3 mmHg		Status	pass	
Sensor Componer	System Mer	mo		Conditio	on		Status	pass	

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ESP	127 - Eric H	ebert-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 Numbe	r Ta Site		Te	chnician	Site Visit Date	Paramo	eter	Owner 1	ID
ThermoElectron Inc	1105347317	ESP127	,	Er	ic Hebert	10/16/2021	Ozone		000734	
Intercept -0		rcept	0.00000		Mfg Serial Number Tfer ID	ThermoElectron 1180930075 01115			er ozone c. Ozone primar	y stan
DAS 1:	D	AS 2:			Slope	1.0056	30 Inte	rcept	0.14	4070
A Avg % Diff: A M	ax % Di A	Avg %Diff A	Max %	6 Di	-	4/7/202		-		
0.0%	0.0%				Cert Date	4///20/	Zi Cori	rCoff	0.98	9990
UseDescription	ConcGroup	Tfer Raw	Tfe	er Corr	Site	Site Unit	RelPer	Dif	AbsDif	
primary	1	0.84	().68	0.55	ppb			-0.13	
primary	2	17.68		7.21	16.84	ppb			-0.37	
primary	3	36.46		5.64	35.63	ppb		-0.03		
primary	4	68.64		7.23	67.61	ppb		0.56		
primary	5	112.25	11	10.03	110.60	ppb		0.52		
Sensor Componen	Audit Pressi	ıre		Conditio	735.0 mmHg		Status	pass		
Sensor Componen	26.6 degree	unobstructed ru	le	Conditio	True		Status	pass		
Sensor Componen	Tree dewline	e >10m or below	inlet	Conditio	on True		Status	pass		
Sensor Componen	ADT <100 v	ehicles further th	nan 2	Conditio	on 65 m		Status	Fail		
Sensor Componen				Conditio			Status			
Sensor Componen					Good		Status			
Sensor Componen					on Clean		Status			
Sensor Componen					on -0.30		Status			
Sensor Componen					on 1.003		Status			
•										
Sensor Componen				Conditio			Status			
Sensor Componen	Fullscale Vo	ltage		Conditio			Status	pass		
Sensor Componen	Cell A Freq.			Condition	87.7 kHz		Status	pass		
Sensor Componen	Cell A Noise)		Conditio	0.7 ppb		Status	pass		
Sensor Componen	Cell A Flow			Conditio	0.71 lpm		Status	pass		
Sensor Componen	Cell A Press	sure		Conditio	699.8 mmHg		Status	pass		
Sensor Componen	Cell A Tmp.			Conditio	33.6 C		Status	pass		
Sensor Componen	Cell B Freq.			Conditio	90.2 kHz		Status	pass		
Sensor Componen	Cell B Noise)		Conditio	0.8 ppb		Status	pass		
Sensor Componen	Cell B Flow			Conditio	0.68 lpm		Status	pass		
Sensor Componen	Cell B Press	sure		Conditio	698.9 mmHg		Status	pass		
Sensor Componen	System Mer	no		Conditio	on		Status	pass		
			-		<u> </u>					

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
STK	138-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	Α	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 0 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Campbell 2128 STK138 Korey Devins 10/16/2021 DAS Primary Das Date: 10/16/2021 **Audit Date** 10/16/2021 Datel Parameter DAS Mfg 11:45:00 11:45:00 Das Time: **Audit Time** 15510194 Tfer Desc. Source generator (D **Serial Number** Das Day: 289 **Audit Day** 289 Tfer ID 01320 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 **Slope** Intercept 0.0001 0.0001 0.0001 0.0001 2/13/2012 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 95740135 Tfer Desc. DVM 01311 Tfer ID 1.00000 0.00000 **Slope** Intercept 2/11/2021 1.00000 **Cert Date** CorrCoff Channel Input **DVM** Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V -0.0001 0.0000 0.0001 7 0.1000 0.0998 0.0998 V V 0.00007 0.3000 0.2996 0.2997 V V 0.00017 V V 0.5000 0.4995 0.4995 0.0000V 0.7000 V 0.0001 7 0.6994 0.6995 V V 0.9000 0.8993 0.8993 0.00007 1.0000 0.9991 0.9992 V V 0.0001

Flow Data Form **Technician** Site Visit Date Parameter **Owner ID** Mfg Serial Number Tag Site STK138 Korey Devins 10/16/2021 Flow Rate 000461 Apex illegible Mfg BIOS Parameter Flow Rate 131818 Tfer Desc. BIOS 220-H **Serial Number** 01417 Tfer ID -0.00058 **Slope** 0.99756 **Intercept** 2/10/2021 0.99993 CorrCoff **Cert Date** -0.008 **DAS 2: DAS 1:** Cal Factor Zero 1.013 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.67% 0.67% 1.5 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. primary pump off 0.000 0.0000.000.000-0.01 1/m1/mleak check 0.000 0.000 0.00 0.000-0.01 1/ml/mprimary 0.000 1/m 0.67% test pt 1 1.487 1.490 1.48 1.50 1/mprimary 1.485 1.490 1.48 0.000 1.50 1/m1/m0.67% primary test pt 2 1.48 0.0001/m0.67% primary test pt 3 1.485 1.490 1.50 1/mSensor Component Leak Test Condition Status pass **Condition** Good Status pass **Sensor Component** Tubing Condition Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry Sensor Component Moisture Present Condition See comments Status pass Sensor Component Filter Distance Condition 4.0 cm Status pass

Condition 2.0 cm

Condition 270 deg

Condition

Status pass

Status pass

Status pass

Sensor Component Filter Depth

Sensor Component Filter Azimuth

Sensor Component System Memo

Ozone Data Form

Mfg	Serial Number	er Ta Site		Tee	chnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElectron Inc	1009241797	STK138	}	Ko	orey Devins	10/16/2021	Ozone		000625
Slope: Intercept CorrCoff	-0.67203 Inte	.67203 Intercept 0.0000			Mfg Serial Number Tfer ID	ThermoElectron Inc 1180030022 Tfer Des 01114		ozone c. Ozone primary stan	
DAS 1: DAS 2: A Avg % Diff: A Max % Di				% Di	Slope 1.00 Cert Date 1/20/2			rcept Coff	0.30550
UseDescription	ConcGroup	Tfer Raw	Tf	fer Corr	Site	Site Unit	RelPer	Dif	AbsDif
primary	1	0.45		0.14	-0.25	ppb	1011 01		-0.39
primary	2	15.95		15.57	14.75	ppb			-0.82
primary	3	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	1	09.43	108.60	ppb		-0.76	
Sensor Component Audit Pressure		Condition		737 mmHg	Status P		pass		
Sensor Component 26.6 degree unobstructed rule			ıle	Conditio	True		Status	pass	
Sensor Component Tree dewline >10m or below inlet			/ inlet	Condition True			Status	atus pass	
Sensor Component ADT <100 vehicles further than 2			nan 2	Condition True			Status	pass	
Sensor Component ADT >100 vehicles further than 5			Condition True			Status	s pass		
Sensor Component Sample Train			Condition Good			Status	atus pass		
Sensor Component Inlet Filter Condition			Conditio	Condition Clean			Status pass		
Sensor Component Offset			Conditio	Condition 0.1			pass		
Sensor Compone	nsor Component Span			Conditio	Condition 1.003			pass	
Sensor Compone	ent Zero Voltag	Zero Voltage			Condition N/A			pass	
Sensor Compone	ent Fullscale Vo	Fullscale Voltage			Condition N/A			pass	
Sensor Compone	ent Cell A Freq.	Cell A Freq.			Condition 106.1 kHz			pass	
Sensor Compone	ent Cell A Noise	Cell A Noise			0.6 ppb	Status	pass		
Sensor Compone	ent Cell A Flow	Cell A Flow			Condition 0.64 lpm			pass	
Sensor Compone	ent Cell A Press	Cell A Pressure			Condition 706.7 mmHg			pass	
Sensor Compone	ent Cell A Tmp.	Cell A Tmp.			lition 36.4 C		Status	pass	
Sensor Compone	ent Cell B Freq.	Cell B Freq.			99.2 kHz		Status	pass	
Sensor Compone	ent Cell B Noise	Cell B Noise			0.6 ppb	Status	pass		
Sensor Compone	ent Cell B Flow	Cell B Flow			0.51 lpm	Status	pass		
Sensor Compone	ent Cell B Press	Cell B Pressure			Condition 707.3 mmHg			pass	
Sensor Compone	ent System Mer	no		Condition	on		Status	pass	

Temperature Data Form Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Korey Devins RM Young 14040 STK138 10/16/2021 Temperature 06407 Mfg Extech Parameter Temperature Tfer Desc. RTD H232734 **Serial Number** 01227 Tfer ID 0.21666 **Slope** 1.00743 **Intercept DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 0.21 0.43 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.08 -0.14 0.0000.3 \mathbf{C} 0.43 27.19 27.3 C Temp Mid Range 27.61 0.000 0.06 primary 45.36 44.81 0.000 C primary Temp High Range 44.7 -0.15Status pass Sensor Component | Shield **Condition** Clean **Sensor Component** Blower **Condition** N/A Status pass Sensor Component Properly Sited **Condition** Properly sited Status pass Sensor Component System Memo Status pass **Condition**

Shelter Temperature Data For Mfg **Serial Number Tag Site** Technician Site Visit Date Parameter **Owner ID** STK138 Korey Devins 10/16/2021 Shelter Temperature Campbell unknown none **DAS 1: DAS 2:** Mfg Extech Parameter Shelter Temperature Abs Avg Err Abs Max Err Abs Avg Err **Abs Max Err** Tfer Desc. RTD H232734 **Serial Number** 0.39 0.62 01227 **Tfer ID** 1.00743 0.21666 **Slope** Intercept 2/18/2021 1.00000 **Cert Date** ${\bf CorrCoff}$

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	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	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 Da	nta Form		F-02058-1500-S1-rev002					
Site ID STK138	Technician Korey Devins	Site Visit Date 10/1	6/2021					
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	Present						
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						
Shelter Working Room $\overline{\checkmark}$	Make Ekto M	odel 8810 (s/n 2149-21)	Shelter Size 640 cuft					
Shelter Clean	Notes There are signs of leaks on the	e walls and floor rot.						
Site OK	Notes							
contin Contir								

Field Systems Data Form F-02058-1500-S3-rev002 Site Visit Date 10/16/2021 Site ID STK138 Technician Korey Devins ✓ N/A Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? ✓ N/A 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 Are the tower and sensors plumb? Mounted to sample tower Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc? **V** 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) ✓ N/A Is the solar radiation sensor plumb? Is it sited to avoid shading, or any artificial or reflected light? 🔽 N/A Is the rain gauge plumb? ✓ N/A 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

✓ N/A

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,

facing north?

11 Is it inclined approximately 30 degrees?

natural or man-made, that may affect the monitoring parameters:

Fi	eld Systems Data Form	F-02058-1500-S4-rev002	
Site	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?	✓	
	ride any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	ary)	regarding conditions listed above, or any other features,

Fi	eld Systems Data Form	F-02058-1500-S5-rev002	
Site	e ID STK138 Technician Korey Devins		Site Visit Date 10/16/2021
	Siting Criteria: Are the pollutant analyzers and deposition eq	uipr	nent 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	l mai	<u>ntenance</u>
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
Prov natu	vide any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	sary)	regarding conditions listed above, or any other features,

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 Do the DAS instruments appear to be in good condition and well maintained? **V** Are all the components of the DAS operational? (printers, modem, backup, etc) Met sensors only Do the analyzer and sensor signal leads pass through lightning protection circuitry? **✓** Are the signal connections protected from the weather and well maintained? **✓** Are the signal leads connected to the correct DAS channel? Are the DAS, sensor translators, and shelter properly **~** grounded? **✓** Does the instrument shelter have a stable power source? **✓** Is the instrument shelter temperature controlled? Grounded Stable Is the met tower stable and grounded?

V

V

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

Is the sample tower stable and grounded?

11 Tower comments?

Field Systems Data Form STK138 Technician Korey Devins Site Visit Date 10/16/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No Yes No N/A **✓ V** Wind speed sensor Data logger **V V** Wind direction sensor Data logger ✓ **V Temperature sensor** Strip chart recorder **✓ V** Relative humidity sensor Computer **V** Solar radiation sensor **V** Modem П **V V Printer** Surface wetness sensor **✓ V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump **V V Humidity sensor translator Surge protector** П **V V UPS Solar radiation translator ~ V** Tipping bucket rain gauge **Lightning protection device** ~ **✓ Shelter heater** Ozone analyzer **V ✓** Filter pack flow controller Shelter air conditioner **V** Filter pack MFC power supply Does the site have the required and most recent QC documents and report forms? Present **Current Station Log V V SSRF ✓ V ✓ V** Site Ops Manual May 2019 **✓ V HASP** May 2019 **✓** Field Ops Manual **V** May 2019 **Calibration Reports V ✓** Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ Are the Site Status Report Forms being completed and **V** current? Are the chain-of-custody forms properly used to document **✓** sample transfer to and from lab? Control charts not used Are ozone z/s/p control charts properly completed and current? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

F-02058-1500-S7-rev002

Field Systems Data Form F-02058-1500-S8-rev002 STK138 Technician Korey Devins Site Visit Date 10/16/2021 Site ID Site operation procedures Trained by previous operator Has the site operator attended a formal CASTNET training ✓ course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **V** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** N/A **Multipoint Calibrations V V** N/A **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **Manual Rain Gauge Test V V** N/A **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? Compliant **OC Check Performed** Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily **V V** As needed Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests V Manual Precision Level Test** As needed **✓ V** Weekly **Analyzer Diagnostics Tests V** Monthly **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V V** Sample Line Check for Dirt/Water Weekly **~ V** Weekly **Zero Air Desiccant Check** Unknown Do multi-point calibration gases go through the complete sample train including all filters? **✓** Do automatic and manual z/s/p gasses go through the complete sample train including all filters? ✓

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

Call-in only

The ozone sample train is leak tested every 2 weeks.

reported? If yes, how?

Are the automatic and manual z/s/p checks monitored and

Fi	Field Systems Data Form					F-02058-1500-S9-rev002					
Site	e ID	STK138	chnician Kore	y Devins		Site Visit Date	10/16/2021				
	Site ope	ration procedures									
1	Is the fil	ter pack being changed eve	ry Tuesday as	scheduled?	✓	Filter changed mori	nings				
2	Are the correctl	Site Status Report Forms by?	eing completed	l and filed	✓						
3	Are data	a downloads and backups bed?	eing performe	d as		No longer required					
4	Are gen	eral observations being made	le and recorde	d? How?	✓	SSRF, logbook					
5	5 Are site supplies on-hand and replenished in a timely fashion?				✓						
6	Are sam	ple flow rates recorded? H	ow?		✓	SSRF, call-in					
7	Are san	uples sent to the lab on a reg	ular schedule	in a timely	✓						
8		ers protected from contaminoping? How?	ation during h	andling	✓	Clean gloves on an	d off				
9		site conditions reported regons manager or staff?	ularly to the fi	eld	✓						
QC	Check P	erformed	Frequenc	ey			Compliant				
N	Aulti-poi	nt MFC Calibrations	✓ Semiannu	ıally			✓				
F	low Syst	em Leak Checks	✓ Weekly				✓				
F	ilter Pac	k Inspection									
F	low Rate	Setting Checks	✓ Weekly				\checkmark				
V	isual Ch	eck of Flow Rate Rotomete					✓				
I	In-line Filter Inspection/Replacement Semiannually				✓						
S	ample Li	ne Check for Dirt/Water	✓ Weekly				\checkmark				
		dditional explanation (photon-made, that may affect the			sary) regarding condit	ions listed above, o	r any other features,			

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
OXF	122-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	В	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 0 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Campbell 2528 OXF122 Korey Devins 10/19/2021 DAS Primary Das Date: 10/19/2021 **Audit Date** 10/19/2021 Datel Parameter DAS Mfg 12:55:15 12:55:15 Das Time: **Audit Time** 15510194 Tfer Desc. Source generator (D **Serial Number** Das Day: 292 **Audit Day** 292 Tfer ID 01320 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 **Slope** Intercept 0.0000 0.0000 0.0001 0.0001 2/13/2012 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 95740135 Tfer Desc. DVM 01311 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/11/2021 1.00000 **Cert Date** CorrCoff Channel Input **DVM** Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V -0.0001 0.0000 0.0001 7 0.1000 0.0998 0.0998 V V 0.00007 0.3000 0.2997 0.2997 V V 0.00007 V V 0.5000 0.4995 0.4995 0.0000V 0.7000 V 0.00007 0.6994 0.6994 V V 0.9000 0.8993 0.8992 -0.0001 7 1.0000 0.9991 0.9991 V V 0.0000

Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter OXF122 Korey Devins 10/19/2021 000658 Apex Flow Rate unknown Mfg BIOS Parameter Flow Rate 131818 Tfer Desc. BIOS 220-H **Serial Number** 01417 Tfer ID -0.00058 **Slope** 0.99756 **Intercept** 2/10/2021 0.99993 CorrCoff **Cert Date** -0.01 **DAS 2: DAS 1:** Cal Factor Zero 1.02 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.60% 0.60% 1.5 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. primary pump off 0.000 0.000-0.01 0.000-0.01 1/m1/mleak check 0.000 -0.01 0.000-0.03 1/ml/m0.000 primary 1.47 0.000 1/m -0.60% test pt 1 1.509 1.510 1.50 1/mprimary 1.510 1.47 0.000 1.50 1/m1/m-0.60% primary test pt 2 1.507 1.47 0.0001/m-0.60% primary test pt 3 1.507 1.510 1.50 1/mSensor Component Leak Test Condition Status pass **Condition** Good Status pass **Sensor Component** Tubing Condition Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry Sensor Component Moisture Present **Condition** No moisture present Status pass Sensor Component Filter Distance Condition 4.5 cm Status pass

Condition 2.5 cm

Condition 45 deg

Condition

Status pass

Status pass

Status pass

Sensor Component Filter Depth

Sensor Component Filter Azimuth

Sensor Component System Memo

Ozone Data Form

Mfg	Mfg Serial Number Ta Site		Te	chnician	Site Visit Date Parameter		eter	Owner ID	
ThermoElectron Inc	1009241778	OXF12	2	Ko	orey Devins	10/19/2021	Ozone		000610
Slope: 1.01494 Slope: 0.00000 Intercept -0.48717 Intercept 0.00000 CorrCoff 1.00000 CorrCoff 0.00000		0	Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114			ozone c. Ozone primary stan		
DAS 1: A Avg % Diff: A M		AS 2: Avg %Diff A	Max '	% Di	Slope Cert Date	1.0003		rcept rCoff	0.30550
UseDescription	ConcGroup	Tfer Raw	Tf	fer Corr	Site	Site Unit	RelPer	Dif	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	1	111.03	112.15	ppb		1	
Sensor Compone	Audit Press	ure		Condition	740.4 mmHg		Status	pass	
Sensor Compone	26.6 degree	unobstructed ru	ıle	Condition	True True		Status	pass	
Sensor Compone	Tree dewlin	e >10m or below	v inlet	Condition	True		Status pass		
Sensor Compone	ADT <100 v	ehicles further t	han 2	Condition 180 m			Status fail		
Sensor Compone	ent ADT >100 v	ehicles further t	han 5	Condition 180 m			Status	tatus fail	
Sensor Compone	Sample Tra	in		Condition Good			Status pass		
Sensor Compone	Inlet Filter C	Condition		Condition	On Clean		Status	pass	
Sensor Compone	Offset			Condition	on 0.4		Status	pass	
Sensor Compone	Span			Condition	on 1.041		Status	pass	
Sensor Compone	Zero Voltag	e		Condition	on N/A		Status	pass	
Sensor Compone	Fullscale Vo	oltage		Condition	n N/A		Status	pass	
Sensor Compone	Cell A Freq.			Condition	109.7 kHz		Status	pass	
Sensor Compone	ent Cell A Noise)		Condition	0.9 ppb		Status	pass	
Sensor Compone	Cell A Flow			Condition	0.64 lpm		Status	pass	
Sensor Compone	ent Cell A Press	sure		Condition	696.9 mmHg		Status	pass	
Sensor Compone	Cell A Tmp.			Condition	on 35.6 C		Status	pass	
Sensor Compone	Cell B Freq.			Condition	91.3 kHz		Status	pass	
Sensor Compone	ent Cell B Noise)		Condition	0.8 ppb		Status	pass	
Sensor Compone	ent Cell B Flow			Condition	0.72 lpm		Status	pass	
Sensor Compone	ent Cell B Press	sure		Condition	697.5 mmHg		Status	pass	
Sensor Compone	System Mer	no		Condition	on		Status	pass	

Temperature Data Form Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Korey Devins RM Young 032128 OXF122 10/19/2021 Temperature 07289 Mfg Extech Parameter Temperature Tfer Desc. RTD H232734 **Serial Number** 01227 Tfer ID 0.21666 **Slope** 1.00743 **Intercept DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 0.10 0.13 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.24 0.02 0.0000.1 \mathbf{C} 0.04 C Temp Mid Range 26.62 26.21 0.000 26.1 -0.13 primary 46.73 46.17 0.000 46.0 C primary Temp High Range -0.13**Condition** Moderately clean Status pass Sensor Component | Shield **Sensor Component** Blower **Condition** N/A Status pass **Sensor Component** Properly Sited **Condition** Properly sited Status pass Sensor Component System Memo Status pass **Condition**

Shelter Temperature Data For Mfg Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Korey Devins Campbell 10755-148 OXF122 10/19/2021 Shelter Temperature none **DAS 1: DAS 2:** Mfg Extech Parameter Shelter Temperature Abs Avg Err Abs Max Err **Abs Avg Err Abs Max Err** Tfer Desc. RTD H232734 **Serial Number** 0.50 0.62 01227 Tfer ID 1.00743 0.21666 **Slope** Intercept 2/18/2021 1.00000 **Cert Date** CorrCoff OSE Unit Difference UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng primary Temp Mid Range 28.82 28.39 0.00029.0 \mathbf{C} 0.62 25.87 C Temp Mid Range 26.28 0.00026.4 0.55 primary

0.000

28.94

Condition

C

Status pass

0.33

29.3

29.37

primary

Temp Mid Range

Sensor Component System Memo

Siting Criteria Form

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

Infrastructure Data For

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

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

Sensor Component	Sample Tower Type	Condition	Туре В	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	Fair	Status	pass
Sensor Component	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	Condition	Fair	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	System Memo	Condition		Status	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
THE	R422-Martin	n 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	В	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 0.37 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Environmental Sys 2600 THR422 Martin Valvur 10/19/2021 DAS Primary Das Date: 10/19/2021 **Audit Date** 10/19/2021 ΗY Parameter DAS Mfg 08:09:22 08:09:00 **Das Time: Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** Das Day: 292 **Audit Day** 292 Tfer ID 01322 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0007 0.0004 0.0007 0.0004 6/15/2014 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 95740243 Tfer Desc. DVM 01312 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/11/2021 1.00000 CorrCoff **Cert Date** Channel Input **DVM** Output DAS Output InputUnit OutputUnit Difference 9 V 0.0000 -0.0006 -0.0002 0.0004 9 0.1000 0.1000 0.0998 V V -0.0002 9 0.3000 0.2996 0.2998 V V 0.0002V V 9 0.5000 0.4991 0.4993 0.0002 V 9 0.7000 V 0.0006 0.6990 0.6996 9 V V 0.9000 0.8993 0.8995 0.0002 9 1.0000 0.9994 1.0001 V V 0.0007

Flow Data Form **Technician Owner ID** Mfg **Serial Number Tag Site** Site Visit Date Parameter Martin Valvur 10/19/2021 flow rate 02170 Tylan AW901295 THR422 Mfg BIOS Parameter Flow Rate Tylan Mfg 148613 Tfer Desc. BIOS 220-H **Serial Number** FP9508008 03870 **SN/Owner ID** 01421 Tfer ID MFC power supply Parameter: 0.00160 **Slope** 1.00850 Intercept 2/10/2021 0.99999 CorrCoff **Cert Date** 0.025 **DAS 1: DAS 2:** Cal Factor Zero 5.389 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 11.07% 11.48% 3.25 **Rotometer Reading:** Test type Input l/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignal PctDifference Desc. primary pump off 0.0000.000-0.03 0.00000.02 1/ml/m leak check 0.000 2.77 0.00003.01 1/ml/m0.000 primary 0.0000 1/m 11.07% test pt 1 2.730 2.710 2.77 3.01 1/mprimary 2.740 2.77 0.0000 3.01 1/m1/m10.66% primary test pt 2 2.720 0.00001/m11.48% test pt 3 2.720 2.700 2.77 3.01 1/mprimary Sensor Component Leak Test Condition Status fail Sensor Component Tubing Condition **Condition** Poor Status Fail Sensor Component Filter Position Status pass **Condition** Good Sensor Component Rotometer Condition Status pass Condition Clean and dry Sensor Component Moisture Present Condition No moisture present Status pass Sensor Component Filter Distance Condition 5.0 cm Status pass

Condition 2.5 cm

Condition 20 deg

Condition See comments

Sensor Component Filter Depth

Sensor Component Filter Azimuth

Sensor Component System Memo

Status pass

Status pass

Status pass

2 Meter Temperature Data Form Calc. Difference Serial Number Tag Site **Technician** Site Visit Date Parameter Mfg **Owner ID** 29200 THR422 Martin Valvur 10/19/2021 Temperature2meter RM Young none Mfg Fluke Parameter Temperature 3275143 Tfer Desc. RTD **Serial Number** 01229 Tfer ID **Slope** 0.99975 **Intercept** -0.00824 **DAS 1: DAS 2:** 2/9/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err CorrCoff **Cert Date** 0.33 0.35 UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Difference Test type Temp Low Rang 0.04 0.05 0.00000.37C 0.32 primary 22.40 22.41 0.0000 22.72 C 0.31 primary Temp Mid Range Temp High Rang primary 45.88 45.90 0.0000 46.25 C 0.35 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 Status pass **Condition**

Shelter Temperature Data For Mfg Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** ARS Martin Valvur 10/19/2021 none THR422 Shelter Temperature none **DAS 1: DAS 2:** Parameter Shelter Temperature Mfg Fluke Abs Avg Err Abs Max Err **Abs Avg Err Abs Max Err** Tfer Desc. RTD 3275143 **Serial Number** 0.56 1.28 01229 Tfer ID -0.00824 **Slope** 0.99975 Intercept 2/9/2021 1.00000 **Cert Date** CorrCoff OSE Unit Difference UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng primary Temp Mid Range 24.12 24.13 0.00023.8 \mathbf{C} -0.36 22.89 22.9 C Temp Mid Range 22.88 0.0000.05 primary

21.03

Condition

0.000

21.02

primary

Temp Mid Range

Sensor Component System Memo

C

Status pass

1.28

22.3

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 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		Condition	Status	pass
Sensor Component		Condition 200 m	Status	Fail

Infrastructure Data For

Site ID THR422	Technician	Martin Valvur	Site Visit Date	10/19/2021
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Shelter Make	Shelter Model	Shelter Size
Ekto	8814 (s/n 3028-1)	896 cuft
AND MADE AND SALES ON THE SALES		

Sensor Component	Sample Tower Type	Condition	Туре В	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	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	Poor	Status	Fail
Sensor Component	System Memo	Condition		Status	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 Visit Date 10/19/2021 OXF122 Technician Korey Devins Site ID Oxford **USGS Map EPA Site Sponsor (agency)** Map Scale Miami University **Operating Group Map Date** 39-017-9991 AQS# Climatronics **Meteorological Type** 39.5314 Air Pollutant Analyzer Ozone **QAPP** Latitude dry, wet **QAPP** Longitude -84.7231 **Deposition Measurement** 284 **Land Use** agriculture, woodland - mixed **QAPP Elevation Meters** 5.2 Terrain gently rolling **QAPP Declination** Yes 2/23/2007 Conforms to MLM **OAPP Declination Date** (513) 523-6912 39.531115 **Site Telephone Audit Latitude** Ecological Research Center -84.723547 Site Address 1 **Audit Longitude** Somerville Rd. 284 Site Address 2 **Audit Elevation** Butler -5.6 **County Audit Declination** Oxford, OH City, State **Present** Fire Extinguisher 45056 New in 2015 Zip Code Eastern First Aid Kit Time Zone **✓ Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **Climbing Belt** Primary Op. E-mail **Backup Operator Security Fence V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail Shelter Working Room ✓ Make Model 8810 (s/n 2107-4) Ekto **Shelter Size** 640 cuft **✓** Notes The shelter roof has been repaired. Shelter Clean **✓** Notes Site OK From Oxford proceed north on route 732. Just outside of town bear right onto Somerville Road. Continue **Driving Directions** 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.

Fic	eld 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:

11 Is it inclined approximately 30 degrees?

Fi	eld Systems Data Form	F-02058-1500-S4-rev002
Site	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?	
	ride any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	

Fi	eld Systems Data Form		F-02058-1500-S5-rev002			
Site	OXF122 Technician Korey Devins		Site Visit Date 10/19/2021			
	Siting Criteria: Are the pollutant analyzers and deposition eq	uipr	nent 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	mai	<u>intenance</u>			
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

natural or man-made, that may affect the monitoring parameters:

F-02058-1500-S6-rev002

Site	· ID	OXF122	Technician	Korey Devins		Site Visit Date	10/19/202	1	
	DAS, se	nsor translators, and p	oeripheral equi	pment operation	ıs aı	nd maintenance			
1		OAS instruments appeintained?	ar to be in good	l condition and	✓				
2		he components of the backup, etc)	DAS operation	al? (printers,	✓				
3		nalyzer and sensor sig g protection circuitry?		through	✓	Met sensors only			
4		signal connections prointained?	tected from the	e weather and	✓				
5	Are the	signal leads connected	to the correct	DAS channel?	✓				
6	Are the grounde	DAS, sensor translato	rs, and shelter	properly	✓				
7	Does the	e instrument shelter ha	ave a stable pov	ver source?	✓				
8	Is the in	strument shelter temp	erature contro	lled?	✓				
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	grounded?						
11	Tower c	omments?							
Pro	vide any	additional explanation	n (photograph o	or sketch if nece	ssai	ry) regarding condi	tions listed	l above, or a	any other features,

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 OXF122 Technician Korey Devins Site Visit Date 10/19/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No Yes No N/A **V V** Wind speed sensor Data logger **V V** Wind direction sensor Data logger ✓ **V** П **Temperature sensor** Strip chart recorder **✓ V** Relative humidity sensor Computer **V** Solar radiation sensor **V** Modem П **V V Printer** Surface wetness sensor **V V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump **V V Humidity sensor translator** Surge protector П **V V UPS Solar radiation translator ~ V** Tipping bucket rain gauge **Lightning protection device** ~ **✓ Shelter heater** Ozone analyzer **V ✓** 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 V V SSRF ✓ V ✓** Site Ops Manual March 2015 **V HASP** March 2015 **✓** Field Ops Manual March 2015 **Calibration Reports V ✓** Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ Are the Site Status Report Forms being completed and **V** current? Are the chain-of-custody forms properly used to document **V** sample transfer to and from lab? Control charts not used Are ozone z/s/p control charts properly completed and current? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S8-rev002 OXF122 Technician Korey Devins Site Visit Date 10/19/2021 Site ID Site operation procedures Trained onsite by previous site operator Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **~** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** N/A **Multipoint Calibrations V V** N/A **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **Manual Rain Gauge Test ✓ V** N/A **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily Manual Zero/Span Tests **V ✓** Daily **Automatic Precision Level Tests Manual Precision Level Test V V** Weekly **Analyzer Diagnostics Tests ~ V** Every 2 weeks **In-line Filter Replacement (at inlet) V V** N/A In-line Filter Replacement (at analyze **V** Weekly 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?

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:

Fi	eld Sy	stems Data Form	1		F-02058-1500-S9-rev002			
Site	e ID	OXF122 T	echnician Korey Devins		Site Visit Date	e 10/19/2021		
	Site ope	ration procedures						
1	Is the fil	ter pack being changed evo	ery Tuesday as scheduled	V	Filter changed mo	rinings		
2	Are the correctly	Site Status Report Forms by?	oeing completed and filed	✓				
3	Are data	a downloads and backups bed?	peing performed as		No longer required	I		
4	Are gen	eral observations being ma	de and recorded? How?	✓	SSRF, logbook			
5	Are site fashion?	supplies on-hand and repl	enished in a timely	✓				
6	Are sam	ple flow rates recorded? H	ow?	✓	SSRF, logbook, ca	all-in		
7	Are sam	ples sent to the lab on a re	gular schedule in a timely	✓				
8		rs protected from contami pping? How?	nation during handling	✓	Clean gloves on a	nd off		
9		site conditions reported reported reported reports manager or staff?	gularly to the field	✓				
QC	Check Po	erformed	Frequency			Compliant		
N	Multi-poii	nt MFC Calibrations	✓ Semiannually			✓		
I	Flow Syste	em Leak Checks	✓ Weekly			✓		
I	Filter Pac	k Inspection						
I	Flow Rate	Setting Checks	✓ Weekly			✓		
1	Visual Ch	eck of Flow Rate Rotomete	r ✓ Weekly			\checkmark		
I	n-line Fil	ter Inspection/Replacemen	t ✓ Semiannually			✓		
S	Sample Li	ne Check for Dirt/Water	Weekly			\checkmark		
		dditional explanation (pho n-made, that may affect th			y) regarding condi	tions listed above, or	any other features,	

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	В	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 Visit Date 10/19/2021 THR422 Technician Martin Valvur Site ID Fryburg NW **USGS Map** NPS Site Sponsor (agency) Map Scale NPS and state of ND **Operating Group Map Date** 38-007-0002 AQS# Climatronics **Meteorological Type** Ozone, SO2, IMPROVE, PM2.5 46.8947 Air Pollutant Analyzer **QAPP** Latitude -103.3778 **Deposition Measurement** dry, wet **QAPP** Longitude 850 **Land Use** prairie **QAPP Elevation Meters** rolling - complex Terrain **QAPP Declination** Marginally Conforms to MLM **OAPP Declination Date** 46.894844 **Site Telephone Audit Latitude** Painted Canyon Visitor Center -103.377719 Site Address 1 **Audit Longitude** Exit 32 Interstate 94 840 Site Address 2 **Audit Elevation** 8.2 Billings **County Audit Declination** Medora, ND City, State **Present** Fire Extinguisher 58645 Zip Code **V** Mountain **First Aid Kit** Time Zone **Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **✓ Climbing Belt** Primary Op. E-mail **V Security Fence Backup Operator V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail **Shelter Working Room** ✓ **Make** Model 8814 (s/n 3028-1) Ekto **Shelter Size** 896 cuft **✓** Notes **Shelter Clean** The shelter is in good condition, clean and well organized.

From Interstate 94 take exit 32 to the Painted Canyon rest area and visitor center. The site is just east of the parking

✓ Notes

lot on a gravel road.

Site OK

Driving Directions

Fi	eld Systems Data Form	F-02058-1500-S3-rev002			
Site	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		
	vide any additional explanation (photograph or sketch if nece ural or man-made, that may affect the monitoring parameters		y) regarding conditions listed above, or any other features,		

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.

Fi	eld Systems Data Form	F-02058-1500-S4-rev00	2
Site	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?		
	vide any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	ary) regarding conditions listed above, or any other features,	

Field Systems Data Form F-02058-1500-S5-rev002 THR422 Technician | Martin Valvur Site Visit Date 10/19/2021 Site ID Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E **~** Do the sample inlets have at least a 270 degree arc of unrestricted airflow? **~** Are the sample inlets 3 - 15 meters above the ground? **~** Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees? Pollutant analyzers and deposition equipment operations and maintenance **~** Do the analyzers and equipment appear to be in good condition and well maintained? **~** Are the analyzers and monitors operational, on-line, and reporting data? Describe ozone sample tube. 3/8 teflon by 10 meters and glass manifold Describe dry dep sample tube. 3/8 teflon by 12 meters At inlet and analyzer Are in-line filters used in the ozone sample line? (if ves indicate location) **~** Are sample lines clean, free of kinks, moisture, and obstructions? **V** Is the zero air supply desiccant unsaturated? Are there moisture traps in the sample lines? **✓** Clean and dry 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:

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

Field Systems Data Form F-02058-1500-S6-rev002 THR422 Technician Martin Valvur Site Visit Date 10/19/2021 Site ID DAS, sensor translators, and peripheral equipment operations and maintenance Do the DAS instruments appear to be in good condition and well maintained? **✓** Are all the components of the DAS operational? (printers, modem, backup, etc) Met sensors only Do the analyzer and sensor signal leads pass through lightning protection circuitry? **✓** Are the signal connections protected from the weather and well maintained? **✓** Are the signal leads connected to the correct DAS channel? Are the DAS, sensor translators, and shelter properly **~** grounded? **✓** Does the instrument shelter have a stable power source? **~** Is the instrument shelter temperature controlled? Grounded **Stable** Is the met tower stable and grounded? Is the sample tower stable and grounded? **V V** 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 THR422 Technician | Martin Valvur Site Visit Date 10/19/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No Yes No N/A **V V** Wind speed sensor Data logger **V V** Wind direction sensor Data logger ✓ **V Temperature sensor** Strip chart recorder **V V** Relative humidity sensor Computer **V** Solar radiation sensor **V** Modem П **V V Printer** Surface wetness sensor **V V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump **V V Humidity sensor translator Surge protector** П **V V UPS Solar radiation translator ~ V** Tipping bucket rain gauge **Lightning protection device** ~ \checkmark Shelter heater Ozone analyzer **V** \checkmark Filter pack flow controller Shelter air conditioner \checkmark Filter pack MFC power supply Does the site have the required and most recent QC documents and report forms? Present **Current Station Log V V** Dataview **SSRF V ✓** 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 Flow section only Are the Site Status Report Forms being completed and current? Are the chain-of-custody forms properly used to document **✓** sample transfer to and from lab? Control charts not used Are ozone z/s/p control charts properly completed and current?

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,

natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S8-rev002 THR422 Technician Martin Valvur Site Visit Date 10/19/2021 Site ID Site operation procedures Trained by previous site operator Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET Trained by current operator training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **~** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **V V** N/A **Multipoint Calibrations V V** N/A **Visual Inspections V V** N/A **Translator Zero/Span Tests (climatronics) V V** N/A **Manual Rain Gauge Test V V** N/A **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V V** Semiannually **V** N/A **Automatic Zero/Span Tests V** Every 2 weeks Manual Zero/Span Tests **V** N/A **Automatic Precision Level Tests V** Every 2 weeks **Manual Precision Level Test V V Analyzer Diagnostics Tests** Semiannually **V V** every 2 months **In-line Filter Replacement (at inlet) V V** every 2 months In-line Filter Replacement (at analyze Sample Line Check for Dirt/Water **V V** Every 2 weeks **Zero Air Desiccant Check** Not performed Do multi-point calibration gases go through the complete sample train including all filters? Do automatic and manual z/s/p gasses go through the Not performed complete sample train including all filters? 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.

Fi	eld Systems Data Form		F-02058-1500-S9-rev002				
Sit	e ID THR422 Tec	hnician Martin	Valvur	Site Visit Date 10/19/2021			
	Site operation procedures						
1	Is the filter pack being changed every	y Tuesday as sc	heduled? 🔽	Filter changed various times			
2	Are the Site Status Report Forms bei	ing completed a	nd filed		-		
3	Are data downloads and backups bei scheduled?	ng performed a	as \Box	No longer required			
4	Are general observations being made	and recorded?	How?	SSRF			
5	Are site supplies on-hand and replen fashion?	ished in a timel	y		_		
6	Are sample flow rates recorded? How	v?	✓	SSRF			
7	Are samples sent to the lab on a regulation?	lar schedule in	a timely 🔽		-		
8	Are filters protected from contamina and shipping? How?	tion during har	ndling 🔽				
9	Are the site conditions reported regu operations manager or staff?	larly to the field	d				
QC	Check Performed	Frequency		Compliant			
]	Multi-point MFC Calibrations	✓ Semiannual	ly	✓			
]	Flow System Leak Checks	✓ Weekly		✓			
]	Filter Pack Inspection						
]	Flow Rate Setting Checks	✓ Weekly		✓			
7	Visual Check of Flow Rate Rotometer	✓ Weekly		✓			
]	In-line Filter Inspection/Replacement	✓ As needed		✓			
,	Sample Line Check for Dirt/Water						
	vide any additional explanation (photo iral or man-made, that may affect the			ry) regarding conditions listed above, or any other features,			

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	В	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
SAN	189-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	В	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 0 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Primary Campbell 2138 **SAN189** Martin Valvur 10/20/2021 DAS Das Date: 10/20/2021 **Audit Date** 10/20/2021 ΗY Parameter DAS Mfg 09:15:00 09:15:00 **Das Time: Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** Das Day: 293 **Audit Day** 293 Tfer ID 01322 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0001 0.0001 0.0002 0.0002 6/15/2014 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 95740243 Tfer Desc. DVM 01312 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/11/2021 1.00000 CorrCoff **Cert Date** Channel Input DVM Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V -0.0005 -0.0003 0.0002 7 0.1000 0.0995 0.0996 V V 0.0001 7 0.3000 0.2997 0.2997 V V 0.0000V V 7 0.5000 0.4989 0.4991 0.0002 V 0.7000 V 0.0001 7 0.6993 0.6994 V V 0.9000 0.8991 0.8990 -0.0001 7 1.0000 0.9997 0.9997 V V 0.0000

Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter SAN189 Martin Valvur 000861 Apex illegible 10/20/2021 Flow Rate Mfg BIOS Parameter Flow Rate 148613 Tfer Desc. BIOS 220-H **Serial Number** 01421 Tfer ID 0.00160 **Slope** 1.00850 Intercept 2/10/2021 0.99999 CorrCoff **Cert Date** -0.05 **DAS 2: DAS 1:** Cal Factor Zero 0.95 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.22% 0.33% 3.65 **Rotometer Reading:** Test type Input l/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignal PctDifference Desc. 1/mprimary pump off 0.0000.0000.06 0.0000.001/mleak check 0.000 0.000 0.05 0.000-0.20 1/ml/mprimary 3.08 1/m 0.33% test pt 1 3.060 3.030 0.000 3.04 1/mprimary 3.060 3.030 3.08 0.000 3.04 1/m1/m0.33% primary test pt 2 3.08 0.0001/m0.00% test pt 3 3.070 3.040 3.04 1/mprimary Sensor Component Leak Test Condition Status pass **Condition** Good Status pass **Sensor Component** Tubing Condition Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry Sensor Component Moisture Present **Condition** No moisture present Status pass Sensor Component Filter Distance Condition 4.0 cm Status pass

Condition 3.0 cm

Condition 270 deg

Condition

Status pass

Status pass

Status pass

Sensor Component Filter Depth

Sensor Component Filter Azimuth

Sensor Component System Memo

Ozone Data Form

Mfg	Serial Number	er Ta Site		Te	chnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElectron Inc	1030244789	SAN189)	Ma	artin Valvur	10/20/2021	Ozone		000685
Intercept -		rcept	0.0000.0000.0000.0000.00000.00000.00000.0000	0	Mfg Serial Number Tfer ID	ThermoElectron 49CPS-70008-3			ozone c. Ozone primary stan
DAS 1:	D	AS 2:			Slope	1.0034	40 Inte i	rcept	0.02230
A Avg % Diff: A N		Avg %Diff A	Max	% Di	Cert Date	1/20/202		:Coff	1.00000
0.0%	0.0%				Cerebute		Corr		
UseDescription	ConcGroup	Tfer Raw	Tf	fer Corr	Site	Site Unit	RelPer	Dif	AbsDif
primary	1	0.03		0.00	-1.17	ppb			-1.17
primary	2	14.11		14.04	12.50	ppb		(12	-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	1	115.95	111.10	ppb		-4.27	
Sensor Compone	nt Audit Press	ure		Condition	724 mmHg		Status	pass	
Sensor Compone	nt 26.6 degree	unobstructed ru	lle	Condition	True		Status	pass	
Sensor Compone	nt Tree dewlin	e >10m or below	inlet	Condition	True		Status	pass	
Sensor Compone	nt ADT <100 v	ehicles further the	nan 2	Condition	100 m		Status	Fail	
Sensor Compone	nt ADT >100 v	ehicles further th	nan 5	Condition	on 100 m		Status	Fail	
Sensor Compone	nt Sample Tra	in		Condition	Good		Status	pass	
Sensor Compone	nt Inlet Filter C	Condition		Condition	On Clean		Status	pass	
Sensor Compone	nt Offset			Condition	0.000		Status	pass	
Sensor Compone	nt Span			Condition	on 1.023		Status	pass	
Sensor Compone	nt Zero Voltag	е		Condition	on N/A		Status	pass	
Sensor Compone	nt Fullscale Vo	ltage		Condition	on N/A		Status	pass	
Sensor Compone	nt Cell A Freq.			Condition	96.1 kHz		Status	pass	
Sensor Compone	nt Cell A Noise	;		Condition	0.9 ppb		Status	pass	
Sensor Compone	nt Cell A Flow			Condition	0.67 lpm		Status	pass	
Sensor Compone	nt Cell A Press	sure		Condition	694.4 mmHg		Status	pass	
Sensor Compone	nt Cell A Tmp.			Condition	32.4 C		Status	pass	
Sensor Compone	nt Cell B Freq.			Condition	on 102 kHz		Status	pass	
Sensor Compone	nt Cell B Noise	•		Condition	0.6 ppb		Status	pass	
Sensor Compone	nt Cell B Flow			Condition	0.66 lpm		Status	pass	
Sensor Compone	nt Cell B Press	sure		Condition	693.8 mmHg		Status	pass	
Sensor Compone	nt System Mer	no		Condition	on		Status	pass	

Temperature Data Form Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Martin Valvur RM Young 14798 SAN189 10/20/2021 Temperature 06537 Mfg Fluke Parameter Temperature Tfer Desc. RTD 3275143 **Serial Number** 01229 Tfer ID -0.00824 **Slope** 0.99975 **Intercept DAS 1: DAS 2:** 2/9/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 0.19 0.35 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.04 0.05 0.0000.2 \mathbf{C} 0.15 C Temp Mid Range 21.53 21.54 0.000 21.6 0.07 primary 46.99 47.01 0.000 C primary Temp High Range 47.4 0.35 Status pass Sensor Component | Shield **Condition** Clean **Sensor Component** Blower **Condition** N/A Status pass Sensor Component Properly Sited **Condition** Properly sited Status pass Sensor Component System Memo Status pass **Condition**

Shelter Temperature Data For Mfg **Serial Number Tag Site Technician** Site Visit Date Parameter **Owner ID** 223461 SAN189 Martin Valvur 10/20/2021 Shelter Temperature Campbell none **DAS 1: DAS 2:** Mfg Fluke Parameter Shelter Temperature Abs Avg Err Abs Max Err Abs Avg Err **Abs Max Err** Tfer Desc. RTD 3275143 **Serial Number** 0.28 0.65 01229 **Tfer ID** 0.99975 -0.00824 **Slope** Intercept 2/9/2021 1.00000 **Cert Date** ${\bf CorrCoff}$

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 Con	nponent System Memo)	Condition	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 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	Sample Tower Type	Condition	Туре В	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 Visit Date 10/20/2021 SAN189 Technician | Martin Valvur Site ID Santee **USGS Map EPA Site Sponsor (agency)** Map Scale Santee Sioux Nation **Operating Group Map Date** 31-107-9991 AQS# R.M. Young **Meteorological Type** Ozone, SO2, NOx, CO Air Pollutant Analyzer **QAPP** Latitude dry **QAPP** Longitude **Deposition Measurement** 429 **Land Use** range **QAPP Elevation Meters** Terrain rolling **QAPP Declination** 6/21/2006 Yes Conforms to MLM **OAPP Declination Date** (402) 857-2546 42.829154 **Site Telephone Audit Latitude** SR S54D -97.854128 Site Address 1 **Audit Longitude** Santee Sioux Indian Reservation 434 Site Address 2 **Audit Elevation** Knox 5.0 **County Audit Declination** Niobrara, NE City, State **Present** Fire Extinguisher 68760 No inspection date Zip Code Central First Aid Kit Time Zone **Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **Climbing Belt** Primary Op. E-mail **Backup Operator Security Fence V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail Shelter Working Room ✓ Make **Model** E8109-26012 Shelter One **Shelter Size** 720 cuft **✓** Notes The shelter is in very good condition. Shelter Clean **✓** Notes Site OK From Yankton, South Dakota go south on route 81. Turn right (south) at the intersection of route 12 and continue **Driving Directions** 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.

Fic	Field Systems Data Form					F-02058-1500-S3-	rev002
Site	e ID	SAN189	Technician	Martin Valvur		Site Visit Date 10/20/2021	
1		d speed and direction s fluenced by obstructio		as to avoid	✓	N/A	
2	(i.e. wind horizont	d sensors mounted so a d sensors should be mo ally extended boom >2 to the prevailing wind	ounted atop the tale 2x the max diam	tower or on a	✓	N/A	
3	Are the	tower and sensors plui	mb?		✓	N/A	
4		temperature shields po diated heat sources su	-	Jositionea to	✓		
5	condition surface a	perature and RH sensons? (i.e. ground below and not steeply sloped. water should be avoid	sensors should l Ridges, hollows	be natural	✓		
6	Is the so	lar radiation sensor pl	umb?		✓	N/A	
7	Is it sited	d to avoid shading, or	any artificial or	reflected light?	✓	N/A	
8	Is the ra	in gauge plumb?			✓	N/A	
9	Is it sited towers, o	d to avoid sheltering efetc?	ffects from build	lings, trees,	✓	N/A	
10	Is the su	rface wetness sensor si	ited with the gri	d surface	✓	N/A	

✓ 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:

11 Is it inclined approximately 30 degrees?

Fi	eld 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?	
	ide any additional explanation (photograph or sketch if necessal or man-made, that may affect the monitoring parameters	ssary) regarding conditions listed above, or any other features, :

Fi	eld Systems Data Form	F-02058-1500-S5-rev002			
Site	SAN189 Technician Martin Valvur		Site Visit Date 10/20/2021		
	Siting Criteria: Are the pollutant analyzers and deposition eq	uipr	nent 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	mai	intenance		
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?	✓			
Prov natu	vide any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	ary)	regarding conditions listed above, or any other features,		

Field Systems Data Form F-02058-1500-S6-rev002 SAN189 Technician | Martin Valvur Site Visit Date 10/20/2021 Site ID DAS, sensor translators, and peripheral equipment operations and maintenance Do the DAS instruments appear to be in good condition and well maintained? **✓** Are all the components of the DAS operational? (printers, modem, backup, etc) Temperature only Do the analyzer and sensor signal leads pass through lightning protection circuitry? **✓** Are the signal connections protected from the weather and well maintained? **✓** Are the signal leads connected to the correct DAS channel? Are the DAS, sensor translators, and shelter properly **~** grounded? **✓** Does the instrument shelter have a stable power source? ~ Is the instrument shelter temperature controlled? Grounded **Stable** Is the met tower stable and grounded? **✓** Is the sample tower stable and grounded? **V V** 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.

SAN189 Technician | Martin Valvur Site Visit Date 10/20/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? Yes No N/A No N/A Yes **V** Wind speed sensor Data logger П **V V** Wind direction sensor Data logger ✓ **V** П **Temperature sensor** Strip chart recorder ✓ **V** Relative humidity sensor Computer **V** П Solar radiation sensor **V** Modem П **V V Printer** Surface wetness sensor ✓ **V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump **V ~ Humidity sensor translator Surge protector** П **V ~ UPS Solar radiation translator ~ V** Tipping bucket rain gauge Lightning protection device ~ \checkmark П **Shelter heater** Ozone analyzer ~ \checkmark 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 V V SSRF V V ✓** Site Ops Manual 2014 **HASP V** 2014 Field Ops Manual **Calibration Reports V V** Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ Are the Site Status Report Forms being completed and **V** current? Are the chain-of-custody forms properly used to document **✓** sample transfer to and from lab? Control charts not used Are ozone z/s/p control charts properly completed and current? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

F-02058-1500-S7-rev002

Field Systems Data Form

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

Field Systems Data Form F-02058-1500-S8-rev002 SAN189 Technician Martin Valvur Site Visit Date 10/20/2021 Site ID Site operation procedures Trained by the previous operator Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET Trained by the current operator training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **V** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** N/A **Multipoint Calibrations V V** N/A **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **Manual Rain Gauge Test V V** N/A **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily Manual Zero/Span Tests **V V** Daily **Automatic Precision Level Tests Manual Precision Level Test ✓ V** Weekly **Analyzer Diagnostics Tests ~** Every 2 weeks **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze Sample Line Check for Dirt/Water **V V** Weekly **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?

	Unknown
✓	

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

SSRF, logbook, call-in

Field Systems Data Form						F-02058-1500-59-rev002			
Sit	e ID	SAN189	Technician	Martin Valvur		Site Visit Date	10/20/2021		
	Site ope	eration procedures							
1 Is the filter pack being changed every Tuesday as scheduled					V	Filter changed morinings			
2	2 Are the Site Status Report Forms being completed and filed correctly?				✓				
3	3 Are data downloads and backups being performed as scheduled?					No longer required			
4	4 Are general observations being made and recorded? How?			ecorded? How?	✓	SSRF, logbook, call	-in		
5 Are site supplies on-hand and replenished in a timely fashion?			✓						
6	6 Are sample flow rates recorded? How?				✓	SSRF, logbook, call-in			
7	Are san	nples sent to the lab on a ro?	egular sch	edule in a timely	✓				
8		ers protected from contampping? How?	ination du	ring handling	✓	Clean gloves on and off			
9		site conditions reported roons manager or staff?	egularly to	the field	✓				
QC	Check P	erformed	Fre	equency			Compliant		
1	Multi-poi	nt MFC Calibrations	✓ Ser	miannually			✓		
]	Flow Syst	em Leak Checks	✓ We	eekly			✓		
Filter Pack Inspection									
Flow Rate Setting Checks Weekly					✓				
Visual Check of Flow Rate Rotometer					✓				
In-line Filter Inspection/Replacement Semiannually			miannually	V					
5	Sample L	ine Check for Dirt/Water	✓ We	ekly			\checkmark		
		additional explanation (pho an-made, that may affect t) regarding conditi	ons listed above, or a	ny other features,	

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	В	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
ALF	I157-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	В	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 0.02 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Primary Campbell 2534 ALH157 Korey Devins 10/21/2021 DAS Das Date: 10/21/2021 **Audit Date** 10/21/2021 Datel Parameter DAS Mfg 12:30:14 Das Time: 12:30:15 **Audit Time** 15510194 Tfer Desc. Source generator (D **Serial Number** Das Day: 294 **Audit Day** 294 Tfer ID 01320 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0001 0.0001 0.0002 0.0002 2/13/2012 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 95740135 Tfer Desc. DVM 01311 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/11/2021 1.00000 **Cert Date** CorrCoff Channel Input DVM Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V 0.0000 0.0000 0.00007 0.1000 0.0998 0.0998 V V 0.00007 0.3000 0.2997 0.2996 V V -0.0001 V V 7 0.5000 0.4995 0.4994 -0.0001 V 0.7000 V -0.0002 7 0.6995 0.6993 V V 0.9000 0.8993 0.8991 -0.0002 7 1.0000 0.9992 0.9990 V V -0.0002

Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter Korey Devins 10/21/2021 000595 Apex illegible ALH157 Flow Rate Mfg BIOS Parameter Flow Rate 131818 Tfer Desc. BIOS 220-H **Serial Number** 01417 Tfer ID -0.00058 **Slope** 0.99756 **Intercept** 2/10/2021 0.99993 CorrCoff **Cert Date** 0 **DAS 2: DAS 1:** Cal Factor Zero 1 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.04% 0.13% 1.5 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. primary pump off 0.000 0.0000.00 0.0000.001/m1/mleak check 0.000 0.000 0.02 0.0000.00 1/ml/mprimary 1.51 0.000 1/m 0.00% test pt 1 1.498 1.500 1.50 1/mprimary 1.498 1.500 1.51 0.000 1.50 1/m1/m0.00% primary test pt 2 0.0001/m0.13% primary test pt 3 1.498 1.500 1.51 1.50 1/mSensor Component Leak Test Condition Status pass **Condition** Good Status pass **Sensor Component** Tubing Condition Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry 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 Status pass **Sensor Component** Filter Azimuth Condition 360 deg Status pass Sensor Component System Memo Condition

Ozone Data Form

Mfg S	erial Numbe	r Ta Site	ŗ	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244805	ALH15	7	Korey Devins	10/21/2021	Ozone	000703
Intercept -1.3	0.55075 Slope. 0.55000		ThermoElectron		ozone Ozone primary stan		
CorrCoff 0.9	99999 Cori	·Coff	0.00000	Tfer ID	01114		
DAS 1:	D A	AS 2:		Slope	1.0003	0 Intercep	t 0.30550
A Avg % Diff: A Ma		Avg %Diff A	A Max % Di	Cert Date	1/20/202		
0.0%	0.0%			Cert Date	1/20/202	Correor	1.00000
UseDescription (ConcGroup	Tfer Raw	Tfer Corr		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	-5.5	
primary	4	67.59	67.00	64.90	ppb	-3.1	
primary	5	111.94	111.16	109.00	ppb	-1.9	96
Sensor Component	Audit Pressu	ıre	Cond	ition 748 mmHg		Status pas	s
Sensor Component	26.6 degree	unobstructed re	ule Cond	ition True		Status pas	s
Sensor Component	Tree dewline	e >10m or belov	w inlet Cond	ition True		Status pas	S
Sensor Component	ADT <100 v	ehicles further t	than 2 Cond	ition True		Status pas	s
Sensor Component	ADT >100 v	ehicles further t	than 5 Cond	ition True		Status pas	s
Sensor Component	Sample Trai	n	Cond	ition Good		Status pas	s
Sensor Component	Inlet Filter C	ondition	Cond	ition Clean		Status pas	S
Sensor Component	Offset		Cond	ition 0.1		Status pas	s
Sensor Component	Span		Cond	ition 1.007		Status pas	s
Sensor Component	Zero Voltage	Э	Cond	ition N/A		Status pas	s
Sensor Component	Fullscale Vo	Itage	Cond	ition N/A		Status pas	s
Sensor Component	Cell A Freq.		Cond	ition 100 kHz		Status pas	S
Sensor Component	Cell A Noise		Cond	ition 0.4 ppb		Status pas	S
Sensor Component	Cell A Flow		Cond	ition 0.73 lpm		Status pas	S
Sensor Component	Cell A Press	ure	Cond	ition 720.3 mmHg		Status pas	S
Sensor Component	Cell A Tmp.		Cond	ition 35.5 C		Status pas	
Sensor Component	Cell B Freq.		Cond	ition 97.8 kHz		Status pas	S
Sensor Component	Cell B Noise			ition 0.6 ppb		Status pas	S
Sensor Component	Cell B Flow		Cond	ition 0.72 lpm		Status pas	S
Sensor Component	Cell B Press	ure	Cond	ition 721.2 mmHg		Status pas	S
Sensor Component	System Men	no	Cond	ition		Status pas	S

Temperature Data Form Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Korey Devins 8897 ALH157 10/21/2021 Temperature 04945 RM Young Mfg Extech Parameter Temperature Tfer Desc. RTD H232734 **Serial Number** 01227 Tfer ID 0.21666 **Slope** 1.00743 Intercept **DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 246.78 246.78 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal | OutputSignalEng | OSE Unit Difference 0.00 -0.22 0.000-247.0 \mathbf{C} -246.78 primary **Condition** Moderately clean Sensor Component Shield 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** Korey Devins Campbell none ALH157 10/21/2021 Shelter Temperature none **DAS 1: DAS 2:** Parameter Shelter Temperature Mfg Extech Abs Avg Err Abs Max Err **Abs Avg Err Abs Max Err** Tfer Desc. RTD H232734 **Serial Number** 0.32 0.56 01227 Tfer ID 1.00743 0.21666 **Slope** Intercept 2/18/2021 1.00000 **Cert Date** CorrCoff OSE Unit Difference UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng primary Temp Mid Range 28.64 28.21 0.00028.4 \mathbf{C} 0.22 25.82 C Temp Mid Range 26.23 0.00026.0 0.17 primary

0.000

27.23

Condition

27.65

primary

Temp Mid Range

Sensor Component System Memo

C

Status pass

0.56

27.8

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
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Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (2149-7)	640 cuft

Sensor Component	Sample Tower Type	Condition	Туре В	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 Site Visit Date 10/21/2021 ALH157 Technician Korey Devins Site ID Pocahontas **USGS Map EPA Site Sponsor (agency)** Map Scale private **Operating Group Map Date** 17-119-9991 AQS# Climatronics **Meteorological Type** 38.8690 Air Pollutant Analyzer Ozone **QAPP** Latitude -89.6229 dry, wet **QAPP** Longitude **Deposition Measurement** 164 **Land Use** agricultural **QAPP Elevation Meters** flat 0.9 Terrain **QAPP Declination** 1/28/2004 Yes Conforms to MLM **OAPP Declination Date** 38.869001 **Site Telephone Audit Latitude** Fairview Road -89.622815 Site Address 1 **Audit Longitude** Site Address 2 **Audit Elevation** 164 Madison -1.1 **County Audit Declination** Pocahontas, IL City, State **Present** Fire Extinguisher 62275 new in 2015 Zip Code Central First Aid Kit Time Zone **✓ Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **Climbing Belt** Primary Op. E-mail **Backup Operator Security Fence V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail Shelter Working Room ✓ Make Model 8810 (2149-7) Ekto **Shelter Size** 640 cuft **✓** Notes The shelter floor has been repaird recently. Walls have signs of leaks. Shelter Clean **✓** Notes Site OK From I-70 take exit 36 (Pokey Road) north to the intersection of route 140. Turn left (west) on route 140 and continue **Driving Directions** 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.

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Fi	eld Systems Data Form		F-02058-1500-S3-rev002				
Site	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				
	ovide any additional explanation (photograph or sketch if nece ural or man-made, that may affect the monitoring parameters		y) regarding conditions listed above, or any other features,				

Temperature mounted in naturally aspirated shield on sample tower.

Fi	eld Systems Data Form	F-02058-1500-S4-rev002	2
Site	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?	V 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?		
	ide any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	ary) regarding conditions listed above, or any other features,	
	remperature sensor is not functioning and reading -247 deg C. It w	as not audited.	

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	ALH157 Technician Korey Devins		Site Visit Date 10/21/2021
	Siting Criteria: Are the pollutant analyzers and deposition eq	<u>uipr</u>	nent 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	mai	intenance
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
	ride any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	ary)	regarding conditions listed above, or any other features,

Field Systems Data Form

F-02058-1500-S6-rev002

Site	e ID	ALH157	Technician K	orey Devins		Site Visi	it Date 10/21/202	1	
	DAS, se	ensor translators, and p	peripheral equipr	nent operation	ıs an	d maintena	<u>nce</u>		
1	1 Do the DAS instruments appear to be in good condition an well maintained?								
2		the components of the , backup, etc)	DAS operational	? (printers,	✓				
3		analyzer and sensor sig		rough	✓	Temperature	e only		
4		signal connections pro intained?	otected from the v	weather and	✓				
5	Are the	signal leads connected	l to the correct D	AS channel?	✓				
6	Are the ground	DAS, sensor translato	rs, and shelter pr	operly	✓				
7	Does th	e instrument shelter h	ave a stable powe	r source?	✓				
8	Is the in	nstrument shelter temp	oerature controlle	ed?	✓				
9	Is the m	net tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	ample tower stable and	l grounded?			_ ✓		✓	
11	Tower	comments?				Met tower re	moved		
		additional explanatio				y) regarding	g conditions liste	d above, or a	ny other features,
nat	ural or n	nan-made, that may af	tect the monitori	ng parameters	S:				

Field Systems Data Form F-02058-1500-S7-rev002 ALH157 Technician Korey Devins Site Visit Date 10/21/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No Yes No N/A **✓ V** Wind speed sensor Data logger **V V** Wind direction sensor Data logger **V V** П **Temperature sensor** Strip chart recorder **✓ V** Relative humidity sensor Computer **V** Solar radiation sensor **V** Modem П **V V Printer** Surface wetness sensor **V V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump **V V Humidity sensor translator** Surge protector П **V V UPS Solar radiation translator ~ V** Tipping bucket rain gauge **Lightning protection device** ~ \checkmark **Shelter heater** Ozone analyzer **V ✓** 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 V V SSRF ✓ V ✓ V** Site Ops Manual May 2019 **✓ V HASP** May 2019 **✓** Field Ops Manual **V** May 2019 **Calibration Reports V ✓** Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ Are the Site Status Report Forms being completed and **V** current? Are the chain-of-custody forms properly used to document **✓** sample transfer to and from lab? Control charts not used Are ozone z/s/p control charts properly completed and current? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S8-rev002 ALH157 Technician Korey Devins Site Visit Date 10/21/2021 Site ID Site operation procedures Trained by previous operator Has the site operator attended a formal CASTNET training ✓ course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET Trained by current operator training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **~** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** N/A **Multipoint Calibrations V V** N/A **Visual Inspections ✓ V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **Manual Rain Gauge Test V V** N/A **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily **V** Manual Zero/Span Tests **V ✓** Daily **Automatic Precision Level Tests V Manual Precision Level Test ✓ V** Weekly **Analyzer Diagnostics Tests ~ V** Every 2 weeks **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V V** Weekly 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?

☐ Unknown
✓

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

✓

Logbook, call-in

Fi	Field Systems Data Form						F-02058-1500-S9-rev002				
Site	e ID	ALH157 T	echni	cian	Korey Devins		Site Visit Dat	e 10/21/20	21		
	Site ope	ration procedures									
1	Is the fi	lter pack being changed ev	ery T	uesda	ny as scheduled	? ✓	Filter changed mo	rinings			
2	Are the correctl	Site Status Report Forms y?	being	comp	pleted and filed	✓					
3	Are dat	a downloads and backups ed?	being	perfo	ormed as		No longer required	i			
4	Are gen	eral observations being ma	de ar	ıd rec	corded? How?	✓	SSRF, logbook				
5	Are site fashion	supplies on-hand and repl	enish	ed in	a timely	✓					
6	Are san	ple flow rates recorded? F	Iow?			✓	SSRF, logbook, ca	all-in			
7	Are san	uples sent to the lab on a re	gular	sche	dule in a timely	✓					
8		ers protected from contami oping? How?	natio	n dur	ing handling	✓	Clean gloves on a	nd off			
9		site conditions reported reons manager or staff?	gular	ly to 1	the field	✓					
QC	Check P	erformed		Free	quency			Complia	int		
N	Multi-poi	nt MFC Calibrations	✓	Sem	iannually			✓			
F	Flow Syst	em Leak Checks	✓	Wee	kly			✓			
F	Filter Pac	k Inspection									
F	Flow Rate	Setting Checks	✓	Wee	kly			✓			
1	Visual Ch	eck of Flow Rate Rotomete	er 🗸	Wee	kly			✓			
I	n-line Fil	ter Inspection/Replacemen	t 🗸	Sem	iannually			✓			
S	Sample Li	ne Check for Dirt/Water	✓	Wee	kly			✓			
		dditional explanation (pho n-made, that may affect tl) regarding condi	tions listed	l above, or	any other fea	tures,

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	В	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
MC	K131-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	Α	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 0 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Campbell 2535 MCK131 Korey Devins 10/22/2021 DAS Primary Das Date: 10/22/2021 **Audit Date** 10/22/2021 Datel Parameter DAS Mfg 15:03:45 15:03:45 Das Time: **Audit Time** 15510194 Tfer Desc. Source generator (D **Serial Number** 295 295 Das Day: **Audit Day** Tfer ID 01320 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 **Slope** Intercept 0.0000 0.0000 0.0001 0.0001 2/13/2012 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 95740135 Tfer Desc. DVM 01311 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/11/2021 1.00000 **Cert Date** CorrCoff Channel Input DVM Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V -0.0001 0.0000 0.0001 7 0.1000 0.0998 0.0998 V V 0.00007 0.3000 0.2997 0.2997 V V 0.00007 V V 0.5000 0.4995 0.4995 0.0000V 0.7000 V 0.00007 0.6994 0.6994 V V 0.9000 0.8993 0.8993 0.00007 1.0000 0.9992 0.9992 V V 0.0000

Flow Data Form **Technician** Site Visit Date Parameter **Owner ID** Mfg Serial Number Tag Site MCK131 Korey Devins 10/22/2021 Flow Rate 000600 Apex illegible Mfg BIOS Parameter Flow Rate 131818 Tfer Desc. BIOS 220-H **Serial Number** 01417 Tfer ID -0.00058 **Slope** 0.99756 **Intercept** 2/10/2021 0.99993 CorrCoff **Cert Date** -0.041 **DAS 2: DAS 1:** Cal Factor Zero 0.959 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.44% 0.66% 1.3 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. primary pump off 0.000 0.0000.02 0.000-0.021/m1/mleak check 0.000 0.000 0.01 0.000-0.03 1/ml/mprimary 1.55 0.000 1/m -0.66% test pt 1 1.507 1.510 1.50 1/mprimary 1.510 1.54 0.000 1.50 1/m1/m-0.66% primary test pt 2 1.506 0.0001/m0.00% primary test pt 3 1.509 1.510 1.55 1.51 1/mSensor Component Leak Test Condition Status pass **Condition** Good Status pass **Sensor Component** Tubing Condition Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry 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

Condition 345 deg

Condition

Sensor Component Filter Azimuth

Sensor Component System Memo

Status pass

Status pass

Ozone Data Form

Mfg	Serial Numbe	er Ta Site		Te	chnician	Site Visit Date	Paramo	eter	Owner ID	
ThermoElectron Inc	1009241783	MCK13	1	Ko	orey Devins	10/22/2021	Ozone		000613	
Intercept -0		rcept	0.0000	0	Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114			ozone c. Ozone primary stan	
DAS 1: A Avg % Diff: A M 0.0%		AS 2: Avg %Diff A	Max '	% Di	Slope Cert Date	1.0003		rcept Coff	0.30550	
UseDescription	ConcGroup	Tfer Raw	Tf	fer Corr	Site	Site Unit	RelPer	Dif	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	1	110.12	107.30	ppb		-2.59		
Sensor Componer	Audit Press	ure		Condition	736.8 mmHg		Status	pass		
Sensor Componer	26.6 degree	unobstructed ru	lle	Condition	True		Status	pass		
Sensor Componer	Tree dewline	e >10m or below	inlet	Condition	on True		Status	pass		
Sensor Componer	ADT <100 v	ehicles further th	nan 2	Condition	True		Status	pass		
Sensor Componer	ADT >100 v	ehicles further th	nan 5	Condition	True		Status	pass		
Sensor Componer	Sample Tra	in		Condition	Good		Status	pass		
Sensor Componer	Inlet Filter C	ondition		Condition	Moderately cle	an	Status	pass		
Sensor Componer	Offset			Condition	on -0.1		Status	pass		
Sensor Componer	Span			Condition	ondition 1.003			Status pass		
Sensor Componer	Zero Voltag	е		Condition	ondition N/A			pass		
Sensor Componer	Tullscale Vo	ltage		Condition			Status	pass		
Sensor Componer	Cell A Freq.			Condition	86.9 kHz		Status	pass		
Sensor Componer	Cell A Noise)		Condition	0.8 ppb		Status			
Sensor Componer	Cell A Flow			Condition	0.68 lpm		Status	pass		
Sensor Componer		sure			724.1 mmHg		Status			
Sensor Componer	Cell A Tmp.			Condition	36.6 C		Status			
Sensor Componer				Condition	95.0 kHz		Status			
Sensor Componer					0.7 ppb		Status			
Sensor Componer					0.69 lpm		Status			
Sensor Componer		sure			725.0 mmHg			Status pass		
Sensor Componer				Condition			Status			

Temperature Data Form Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Korey Devins RM Young 023293 MCK131 10/22/2021 Temperature 07002 Mfg Extech Parameter Temperature Tfer Desc. RTD H232734 **Serial Number** 01227 Tfer ID 0.21666 **Slope** 1.00743 **Intercept DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 0.12 0.20 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.22 0.00 0.0000.2 \mathbf{C} 0.2 C Temp Mid Range 25.04 24.64 0.000 24.6 -0.09 primary 46.59 46.03 0.000 C -0.07 primary Temp High Range 46.0 **Condition** Moderately clean **Status** Pass Sensor Component Shield **Sensor Component** Blower **Condition** N/A Status pass **Sensor Component** Properly Sited **Condition** Properly sited Status pass Sensor Component System Memo Status pass **Condition**

Shelter Temperature Data For Mfg **Serial Number Tag Site Technician** Site Visit Date Parameter **Owner ID** MCK131 Korey Devins 10/22/2021 Shelter Temperature Campbell none none **DAS 1: DAS 2:** Extech Parameter Shelter Temperature Mfg Abs Avg Err Abs Max Err Abs Avg Err **Abs Max Err** Tfer Desc. RTD H232734 **Serial Number** 0.37 0.68 01227 **Tfer ID** 1.00743 0.21666 **Slope** Intercept 2/18/2021 1.00000 **Cert Date** ${\bf CorrCoff}$

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal OutputSignalEng OSE Unit Difference				
primary	Temp Mid Range	25.85	25.44	0.000	25.2	С	-0.2	
primary	primary Temp Mid Range 24.03		23.64	0.000	24.3	С	0.68	
primary	ary Temp Mid Range 26.41		26.00	0.000	25.8	С	-0.22	
Sensor Component System Memo			Condition	ion 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 ROCK 131 Technician Roley Devills Site Visit Date 10/22/2021	Site ID	MCK131	Technician	Korey Devins	Site Visit Date	10/22/2021
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Shelter Make	Shelter Model	Shelter Size	
Ekto	8810	640 cuft	

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.	Hazaro	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
MC	K231-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 0 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Campbell 2137 MCK231 Korey Devins 10/22/2021 DAS Primary Das Date: 10/22/2021 **Audit Date** 10/22/2021 Datel Parameter DAS Mfg 15:02:45 15:02:45 Das Time: **Audit Time** 15510194 Tfer Desc. Source generator (D **Serial Number** 295 295 Das Day: **Audit Day** Tfer ID 01320 **High Channel: Low Channel: Avg Diff: Avg Diff: Max Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0001 0.0001 0.0001 0.0001 2/13/2012 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 95740135 Tfer Desc. DVM 01311 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/11/2021 1.00000 **Cert Date** CorrCoff Channel Input DVM Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V -0.0001 0.0000 0.0001 7 0.1000 0.0998 0.0999 V V 0.0001 7 0.3000 0.2997 0.2997 V V 0.00007 V V 0.5000 0.4995 0.4996 0.0001 V 0.7000 V 0.0001 7 0.6994 0.6995 V V 0.9000 0.8993 0.8993 0.00007 1.0000 0.9991 0.9992 V V 0.0001

Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter MCK231 Korey Devins 10/22/2021 000892 Apex illegible Flow Rate Mfg BIOS Parameter Flow Rate 131818 Tfer Desc. BIOS 220-H **Serial Number** 01417 Tfer ID -0.00058 **Slope** 0.99756 **Intercept** 2/10/2021 0.99993 CorrCoff **Cert Date** 0.008 **DAS 2: DAS 1:** Cal Factor Zero A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.44% 0.67% 1.5 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. 1/mprimary pump off 0.000 0.000-0.01 0.0000.00 1/mleak check 0.000 0.000 -0.02 0.000-0.01 1/ml/mprimary 1.50 0.000 1/m 0.00% test pt 1 1.498 1.500 1.50 1/mprimary 1.492 1.500 1.50 0.000 1.49 1/m1/m-0.67% primary test pt 2 0.0001/m-0.66% primary test pt 3 1.501 1.510 1.50 1.50 1/mSensor Component Leak Test Condition Status pass **Condition** Good Status pass **Sensor Component** Tubing Condition Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry 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 Status pass **Sensor Component** Filter Azimuth Condition 105 deg

Condition

Sensor Component System Memo

Status pass

Ozone Data Form

Mfg S	Serial Numbe	er Ta Site	,	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244801	MCK23	1	Korey Devins	10/22/2021	Ozone	000695
- I	99682 Slop		0.00000	Mfg	ThermoElectron		oter ozone
		1	0.00000	Serial Number	1180030022	Tfer De	Ozone primary stan
Correon	55555 COF	rColl	0.00000	Tfer ID	01114		
DAS 1:	D	AS 2:		Slope	1.0003	0 Intercept	0.30550
A Avg % Diff: A Ma		Avg %Diff A	Max % Di	•	1/20/202		
0.0%	0.0%			Cert Date	1/20/202	1 CorrCoff	1.00000
UseDescription	ConcGroup	Tfer Raw	Tfer Cor	r 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	Audit Press	ure	Cond	736.8 mmHg		Status pass	
Sensor Component	26.6 degree	unobstructed ru	ule Cond	ition True		Status pass	
Sensor Component	Tree dewline	e >10m or belov	v inlet Cond	ition True		Status pass	
Sensor Component	ADT <100 v	ehicles further t	han 2 Cond	ition True		Status pass	
Sensor Component	ADT >100 v	ehicles further t	han 5 Cond	ition True		Status pass	
Sensor Component	Sample Tra	in	Cond	ition Good		Status pass	
Sensor Component	Inlet Filter C	ondition	Cond	ition Moderately cle	an	Status pass	
Sensor Component	Offset		Cond	ition -0.1		Status pass	
Sensor Component	Span		Cond	ition 1.008		Status pass	
Sensor Component	Zero Voltag	е	Cond	ition N/A		Status pass	
Sensor Component	Fullscale Vo	ltage	Cond	ition N/A		Status pass	
Sensor Component	Cell A Freq.		Cond	ition 89.0 kHz		Status pass	
Sensor Component	Cell A Noise)		ition 2.3 ppb		Status pass	
Sensor Component	Cell A Flow		Cond	ition 0.71 lpm		Status pass	
Sensor Component	Cell A Press	sure	Cond	ition 707.2 mmHg		Status pass	
Sensor Component	Cell A Tmp.			ition 33.6 C		Status pass	
Sensor Component	Cell B Freq.		Cond	ition 97.3 kHz		Status pass	
Sensor Component	Cell B Noise			ition 1.6 ppb		Status pass	
Sensor Component	Cell B Flow		Cond	ition 0.71 lpm		Status pass	
Sensor Component	Cell B Press	sure	Cond	ition 707.8 mmHg		Status pass	
Sensor Component	System Mer	no	Cond	ition		Status pass	

Temperature Data Form Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Korey Devins 07003 RM Young 025496 MCK231 10/22/2021 Temperature Mfg Extech Parameter Temperature Tfer Desc. RTD H232734 **Serial Number** 01227 Tfer ID 0.21666 **Slope** 1.00743 **Intercept DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 0.22 0.27 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.22 0.00 0.0000.3 \mathbf{C} 0.27 C Temp Mid Range 25.04 24.64 0.000 24.4 -0.24 primary 46.59 46.03 0.000 45.9 C primary Temp High Range -0.15**Condition** Moderately clean Status pass Sensor Component Shield **Sensor Component** Blower **Condition** N/A Status pass **Sensor Component** Properly Sited **Condition** Properly sited Status pass Sensor Component System Memo Status pass **Condition**

Shelter Temperature Data For Mfg **Serial Number Tag Site** Technician Site Visit Date Parameter **Owner ID** MCK231 Korey Devins 10/22/2021 Shelter Temperature Campbell none none **DAS 1: DAS 2:** Mfg Extech Parameter Shelter Temperature Abs Avg Err Abs Max Err Abs Avg Err **Abs Max Err** Tfer Desc. RTD H232734 **Serial Number** 0.18 0.42 01227 **Tfer ID** 1.00743 0.21666 **Slope** Intercept 2/18/2021 CorrCoff1.00000 **Cert Date**

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	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

Sit	te ID	MCK231	Technician	Korey Devins		Site Visit Date	10/22/2021	
	Shelter Ma	ıke	Shelter Model		Shelte	er Size		
	Ekto		8810		640 cu	ıft		

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 Visit Date 10/22/2021 Technician Korey Devins MCK131 Site ID Mackville **USGS Map EPA Site Sponsor (agency)** Map Scale Private **Operating Group** 21-229-9991 **Map Date** AQS# R.M. Young **Meteorological Type** 37.7044 Air Pollutant Analyzer Ozone **QAPP** Latitude dry, wet **QAPP** Longitude -85.0483 **Deposition Measurement** 353 **Land Use** agriculture, woodland - mixed **QAPP Elevation Meters** 4.25 Terrain rolling **QAPP Declination** 12/28/2004 Marginally Conforms to MLM **OAPP Declination Date** (859) 262-5181 37.704678 **Site Telephone Audit Latitude** Westley Miller Road -85.048706 Site Address 1 **Audit Longitude** 293 Site Address 2 **Audit Elevation** Washington -4.5 **County Audit Declination** Harrodsburg, KY City, State **Present** Fire Extinguisher 40330 New in 2015 Zip Code Eastern **First Aid Kit** Time Zone **✓ Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **Climbing Belt** Primary Op. E-mail **Backup Operator Security Fence V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail **Shelter Working Room** ✓ **Make** Model 8810 Ekto **Shelter Size** 640 cuft **✓** Notes **Shelter Clean** The shelter is neat and well organized. **✓** Notes Site OK From Danville go west on 150 toward Perryville. In Perryville turn right (north) on 1920 or Battlefield Road. Continue **Driving Directions**

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.

Fie	eld Systems Data Form		F-02058-1500-S3-rev002
Site	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	✓	N/A
3	tower into the prevailing wind) 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:

Fi	eld Systems Data Form	F-02058-1500-S4-rev002
Site	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?	
	ide any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	sary) regarding conditions listed above, or any other features,

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Sit	MCK131 Technician Korey Devins		Site Visit Date 10/22/2021
	Siting Criteria: Are the pollutant analyzers and deposition eq	uipı	nent 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	l ma	intenance
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
Prov	vide any additional explanation (photograph or sketch if necess	ary)	regarding conditions listed above, or any other features,
ıatu	ral or man-made, that may affect the monitoring parameters:		

Field Systems Data Form

F-02058-1500-S6-rev002

Site	e ID	MCK131	Technician	Korey Devins		Site Visit	Date	10/22/2021		
	DAS se	ensor translators, and j	arinharal aquin	ment operation	ıc or	d maintanan				
				-		u mamtenan	<u>ice</u>			
1		DAS instruments appe intained?	ar to be in good	condition and	✓					
2		the components of the , backup, etc)	DAS operationa	l? (printers,	✓					
3		analyzer and sensor sig g protection circuitry		hrough	✓	Met sensors o	only			
4		signal connections pro intained?	otected from the	weather and	✓					
5	Are the	signal leads connected	l to the correct E	OAS channel?	✓					
6	Are the ground	DAS, sensor translato	rs, and shelter p	roperly	✓					
7	Does th	e instrument shelter h	ave a stable pow	er source?	✓					
8	Is the ir	strument shelter temp	erature controll	ed?	✓					
9	Is the m	net tower stable and gr	ounded?			Stable			Grounded	
10	Is the sa	ample tower stable and	l grounded?			V			✓	
11	Tower	comments?				Met tower ren	noved			
Dus	wide ex-	additional avalanctic	n (nhataguanh s	n skotob if ne se	000	u) nogoudir -	oon dist	ong lists d	above er e	ny othon foctures
		additional explanation an-made, that may af				y) regarding	conaiti	ions nstea	above, or a	my other leatures,

Field Systems Data Form F-02058-1500-S7-rev002 MCK131 Technician Korey Devins Site Visit Date 10/22/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No Yes No N/A **V V** Wind speed sensor Data logger **V V** Wind direction sensor Data logger **V V** П **Temperature sensor** Strip chart recorder **✓ V** Relative humidity sensor Computer **V** Solar radiation sensor **V** Modem П **V V Printer** Surface wetness sensor **V V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump **V V Humidity sensor translator Surge protector** П **V V UPS Solar radiation translator ~ V** Tipping bucket rain gauge **Lightning protection device** ~ **✓** Shelter heater Ozone analyzer **V ✓** 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 V V SSRF ✓ V ✓ V** Site Ops Manual May 2019 **V HASP ✓** May 2019 **✓** Field Ops Manual **V** May 2019 **Calibration Reports V ✓** Electronic copy Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ Are the Site Status Report Forms being completed and **V** current? Are the chain-of-custody forms properly used to document **V** sample transfer to and from lab? Control charts not used Are ozone z/s/p control charts properly completed and current? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S8-rev002 MCK131 Technician Korey Devins Site Visit Date |10/22/2021 Site ID Site operation procedures Trained on-site by MACTEC technician Has the site operator attended a formal CASTNET training ✓ course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **✓** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** Semiannually **Multipoint Calibrations V V** Weekly **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **Manual Rain Gauge Test V V** Weekly **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily **V** Manual Zero/Span Tests **V ✓** Daily **Automatic Precision Level Tests V Manual Precision Level Test ✓ V** Weekly **Analyzer Diagnostics Tests ~** Every 2 weeks **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V V** Weekly Sample Line Check for Dirt/Water **V V** Weekly **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?

	Unknown
✓	
✓	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-02058-15	000-89-rev002		
Sit	Site ID MCK131 Tec			cian	Korey Devins		Site Visit Date	10/22/2021			
	Site operation	n procedures									
1	Is the filter p	ack being change	ed every T	uesda	ny as scheduled?	V	Filter changed morinings				
2	Are the Site Status Report Forms being completed and filed correctly?					✓					
3	Are data dow scheduled?	vnloads and back	ups being	perfo	ormed as		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 fashion?	Are samples sent to the lab on a regular schedule in a timely fashion?				✓					
8	Are filters pr and shipping	otected from con? How?	itaminatio	n dur	ing handling	✓	Clean gloves on and off				
9		onditions report anager or staff?	ed regular	ly to	the field	✓					
QC	Check Perfor	med		Free	quency			Compliant			
1	Multi-point MI	FC Calibrations	✓	Sem	iannually			✓			
]	Flow System L	eak Checks	✓	Wee	kly			✓			
]	Filter Pack Ins	pection									
]	Flow Rate Setti	ing Checks	✓	Wee	kly			✓			
1	Visual Check o	f Flow Rate Roto	ometer 🔽	Wee	kly			✓			
]	In-line Filter Ir	spection/Replac	ement 🔽	As n	eeded			✓			
\$	Sample Line C	heck for Dirt/Wa	ter 🗸	Wee	kly			\checkmark			
		onal explanation ade, that may aff				sary) regarding condition	ons listed above, or a	ny other features,		

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	<u> </u> 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 Visit Date 10/22/2021 MCK231 Technician Korey Devins Site ID Mackville **USGS Map EPA Site Sponsor (agency)** Map Scale Private **Operating Group** 21-229-9991 **Map Date** AQS# R.M. Young **Meteorological Type** 37.7044 Air Pollutant Analyzer Ozone **QAPP** Latitude dry, wet **QAPP** Longitude -85.0483 **Deposition Measurement** 353 **Land Use** agriculture, woodland - mixed **QAPP Elevation Meters** 4.25 rolling Terrain **QAPP Declination** 12/28/2004 Marginally Conforms to MLM **OAPP Declination Date** (859) 262-5181 37.704678 **Site Telephone Audit Latitude** Wesley Miller Road -85.048706 Site Address 1 **Audit Longitude** 293 Site Address 2 **Audit Elevation** Washington -4.5 **County Audit Declination** Harrodsburg, KY City, State **Present** Fire Extinguisher 40330 New in 2015 **Zip Code** Eastern **First Aid Kit** Time Zone **✓ Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **Climbing Belt** Primary Op. E-mail **Backup Operator Security Fence V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail **Shelter Working Room** ✓ **Make** Ekto Model 8810 **Shelter Size** 640 cuft **✓** Notes The site instruments are located in the MCK131 shelter. The same site operator is servicing both Shelter Clean sites.

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

✓ Notes

mile. The site is on the left through a farm gate.

Site OK

Driving Directions

F-02058-1500-S3-rev002 **Field Systems Data Form** Site Visit Date 10/22/2021 Site ID MCK231 Technician Korey Devins ✓ N/A Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? ✓ N/A 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 Are the tower and sensors plumb? Temperature facing south Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc? **V** 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) ✓ N/A Is the solar radiation sensor plumb? Is it sited to avoid shading, or any artificial or reflected light? 🔽 N/A Is the rain gauge plumb? ✓ N/A 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? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,

natural or man-made, that may affect the monitoring parameters:

Fi	eld Systems Data Form	F-02058-1500-S4-rev00	2
Site	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?		
	ide any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	ary) regarding conditions listed above, or any other features,	

K1	eld Systems Data Form		F-02058-1500-S5-rev002
Sit	ID MCK231 Technician Korey Devins		Site Visit Date 10/22/2021
	Siting Criteria: Are the pollutant analyzers and deposition ed	<u>quipr</u>	nent 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	d mai	intenance
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
Prov	ide any additional explanation (photograph or sketch if neces	sary)	regarding conditions listed above, or any other features,
atu	ral or man-made, that may affect the monitoring parameters:		

Field Systems Data Form

F-02058-1500-S6-rev002

Site	e ID	MCK231	Technician K	orey Devins		Site Visit Date	10/22/202	1	
	DAS, se	nsor translators, and j	peripheral equipr	nent operations	an	d maintenance			
1	Do the l	DAS instruments appe intained?		_	v				
2		the components of the , backup, etc)	DAS operational	? (printers,	/				
3		nnalyzer and sensor sig g protection circuitry		rough	~	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 th	e instrument shelter h	ave a stable powe	r source?	/				
8	Is the in	strument shelter temp	oerature controlle	d? ▼	✓				
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded	
10	Is the sa	ample tower stable and	l grounded?					<u> </u>	
11	Tower o	comments?			I	Met tower removed		<u> </u>	
		additional explanationan-made, that may af				y) regarding condi	tions listed	l above, or a	ny other features,

Field Systems Data Form F-02058-1500-S7-rev002 MCK231 Technician Korey Devins Site Visit Date 10/22/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No Yes No N/A **V V** Wind speed sensor Data logger **V V** Wind direction sensor Data logger **V V** П **Temperature sensor** Strip chart recorder **✓ V** Relative humidity sensor Computer **V** Solar radiation sensor **V** Modem П **V V Printer** Surface wetness sensor **V V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump **V ~ Humidity sensor translator Surge protector** П **V ~ UPS Solar radiation translator ~ V** Tipping bucket rain gauge **Lightning protection device** ~ **✓** Shelter heater Ozone analyzer **V ✓** 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 V V SSRF ✓ V ✓ V** Site Ops Manual May 2019 **V HASP ✓** May 2019 **✓** Field Ops Manual **V** May 2019 **Calibration Reports V ✓** Electronic copy Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ Are the Site Status Report Forms being completed and **V** current? Are the chain-of-custody forms properly used to document **V** sample transfer to and from lab? Control charts not used Are ozone z/s/p control charts properly completed and current? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S8-rev002 MCK231 Technician Korey Devins Site Visit Date 10/22/2021 Site ID Site operation procedures Trained on-site by MACTEC technician Has the site operator attended a formal CASTNET training ✓ course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **~** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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** Compliant Frequency **V ✓** Semiannually **Multipoint Calibrations V V** Weekly **Visual Inspections** ~ N/A Translator Zero/Span Tests (climatronics) **✓ V** N/A **Manual Rain Gauge Test V V** Weekly **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed** Frequency Compliant **Multi-point Calibrations V V** Semiannually **V V** Daily **Automatic Zero/Span Tests V** Manual Zero/Span Tests

Au	tomatic Precision Level Tests	✓	Daily			✓		
Ma	nnual Precision Level Test					✓		
An	alyzer 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 Week		Weekly			✓			
1	Do multi-point calibration gases go throusample train including all filters?							
2 Do automatic and manual z/s/p gasses go through the complete sample train including all filters?			✓					
3	The state of the s			✓	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:

FI	eid Systems Da	ta Form				F-02058-1500-59-rev002			
Sit	e ID MCK231	Tec	hnician	Korey Devins		Site Visit Date	10/22/2021		
	Site operation procedu	<u>ıres</u>							
1	Is the filter pack being	changed every	y Tuesda	y as scheduled?	V	Filter changed morir	nings		
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 fashion?	e lab on a regu	lar sche	dule in a timely	✓				
8	Are filters protected fr and shipping? How?	om contamina	tion dur	ing handling	✓	Clean gloves on and off			
9	Are the site conditions operations manager or		larly to	the field	✓				
QC	Check Performed		Free	luency			Compliant		
ľ	Multi-point MFC Calibr	ations	✓ Sem	iannually			\checkmark		
1	Flow System Leak Checl	ks	✓ Wee	kly			✓		
]	Filter Pack Inspection								
]	Flow Rate Setting Check	KS	Weekly				✓		
•	Visual Check of Flow Rate Rotometer Weekly						✓		
]	n-line Filter Inspection/Replacement As needed						✓		
5	Sample Line Check for Dirt/Water						\checkmark		
	vide any additional expla iral or man-made, that i				sary) regarding condition	ons listed above, or a	ny other features,	

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
ABT	147 - 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	er Tag Site		Technician		Site Visit Date	Parame	eter	Owner ID
ThermoElectron Inc	hermoElectron 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 DAS 1: DAS 2:		0.00000		Mfg Serial Number Tfer ID Slope	ThermoElectron 1180030022 01114 1.0003	Tf	er Desc	Ozone primary stan 0.30550	
A Avg % Diff: A M	Max % Dif A	Avg %Diff A	Max % D	if	•			•	
0.0%	0.0%				Cert Date	1/20/202	Cori	·Coff	1.00000
UseDescription primary	ConcGroup	Tfer Raw	Tfer C		Site 0.27	Site Unit	RelPer	Dif	AbsDif 0.03
primary	2	15.33	14.9		14.85	ppb			-0.11
primary	3	34.60	34.1	5	34.04	ppb		-0.32	
primary	4	66.82	66.2		66.19	ppb		-0.06	
primary	5	109.03	108.2	26	108.20	ppb		-0.06	
Sensor Compone	Audit Pressi	ure	Co	nditio	746.5 mmHg		Status	pass	
Sensor Compone	nt 26.6 degree	unobstructed ru	le Co	nditio	True		Status	pass	
Sensor Compone	Tree dewline	e >10m or below	inlet Co	nditio	True		Status	pass	
Sensor Compone	ant ADT <100 v	ehicles further th	nan 20 Co	nditio	True		Status pass		
Sensor Component ADT >100 vehicles further than 50			nan 50 Co	nditio	True		Status pass		
Sensor Compone	Sample Trai	in	Co	nditio	Good		Status	pass	
Sensor Compone	Inlet Filter C	ondition	Co	Condition Clean			Status pass		
Sensor Compone	Offset		Co	Condition 0.1			Status pass		
Sensor Compone	Span		Co	Condition 1.008			Status pass		
Sensor Compone	zero Voltage	е	Co	nditio	n N/A		Status	pass	
Sensor Compone	ent Fullscale Vo	ltage	Co	nditio	n N/A		Status	pass	
Sensor Compone	Cell A Freq.		Co	nditio	97.9 kHz		Status	pass	
Sensor Compone	cell A Noise	;	Co	nditio	0.6 ppb		Status	pass	
Sensor Compone	Cell A Flow		Co	nditio	0.71 lpm		Status	pass	
Sensor Compone	cell A Press	sure	Co	nditio	720.1 mmHg		Status	pass	
Sensor Compone	Cell A Tmp.		Co	nditio	33.6 C		Status	pass	
Sensor Compone	cell B Freq.		Co	nditio	on 100.4 kHz		Status	pass	
Sensor Compone	cell B Noise)	Co	nditio	0.8 ppb		Status	pass	
Sensor Compone	Cell B Flow		Co	nditio	dition 0.67 lpm			pass	
Sensor Component Cell B Pressure			Co	nditio	720.7 mmHg		Status pass		
Sensor Component System Memo			Co	nditio	on		Status	pass	

Site Inventory by Site Visit

Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
LAV410-Martin Valvur-11/04/2021							
11/4/2021	Computer	Hewlett Packard	none	ProBook	Unknown		
11/4/2021	DAS	Environmental Sys Corp	90535	8816	2026		
11/4/2021	Elevation	Elevation	None	1	None		
11/4/2021	Filter pack flow pump	Thomas	none	107CA18B	081700057768		
11/4/2021	flow rate	Tylan	none	FC280SAV	AW02213004		
11/4/2021	Infrastructure	Infrastructure	none	none	none		
11/4/2021	Met tower	Rohn	none	unknown	none		
11/4/2021	MFC power supply	Tylan	00042	RO-32	FP902022		
11/4/2021	Modem	US Robotics	none	56k	unknown		
11/4/2021	Ozone	ThermoElectron Inc	90834	49C	49C-520012-328		
11/4/2021	Ozone Standard	ThermoElectron Inc	90567	49C	49C-59283-322		
11/4/2021	Sample Tower	Aluma Tower	923314	В	AT-5324-F6-O		
11/4/2021	Shelter Temperature	ARS	none	unknown	none		
11/4/2021	Siting Criteria	Siting Criteria	None	1	None		
11/4/2021	Temperature2meter	RM Young	none	41342VC	029458		
11/4/2021	Zero air pump	Twin Tower Engineering	none	TT70/4E	526292		
	11/4/2021 11/4/2021 11/4/2021 11/4/2021 11/4/2021 11/4/2021 11/4/2021 11/4/2021 11/4/2021 11/4/2021 11/4/2021 11/4/2021 11/4/2021 11/4/2021 11/4/2021 11/4/2021	11/4/2021 Computer 11/4/2021 DAS 11/4/2021 Elevation 11/4/2021 Filter pack flow pump 11/4/2021 flow rate 11/4/2021 Infrastructure 11/4/2021 Met tower 11/4/2021 MFC power supply 11/4/2021 Modem 11/4/2021 Ozone 11/4/2021 Ozone Standard 11/4/2021 Sample Tower 11/4/2021 Shelter Temperature 11/4/2021 Siting Criteria 11/4/2021 Temperature2meter	11/4/2021 Computer Hewlett Packard 11/4/2021 DAS Environmental Sys Corp 11/4/2021 Elevation Elevation 11/4/2021 Filter pack flow pump Thomas 11/4/2021 flow rate Tylan 11/4/2021 Infrastructure Infrastructure 11/4/2021 Met tower Rohn 11/4/2021 MFC power supply Tylan 11/4/2021 Modem US Robotics 11/4/2021 Ozone ThermoElectron Inc 11/4/2021 Sample Tower Aluma Tower 11/4/2021 Shelter Temperature ARS 11/4/2021 Siting Criteria Siting Criteria 11/4/2021 Temperature2meter RM Young	#10-Martin Valvur-11/04/2021 11/4/2021 Computer Hewlett Packard none 11/4/2021 DAS Environmental Sys Corp 90535 11/4/2021 Elevation Elevation None 11/4/2021 Filter pack flow pump Thomas none 11/4/2021 flow rate Tylan none 11/4/2021 Infrastructure Infrastructure none 11/4/2021 Met tower Rohn none 11/4/2021 MFC power supply Tylan 00042 11/4/2021 Modem US Robotics none 11/4/2021 Ozone ThermoElectron Inc 90834 11/4/2021 Sample Tower Aluma Tower 923314 11/4/2021 Shelter Temperature ARS none 11/4/2021 Siting Criteria Siting Criteria None 11/4/2021 Temperature2meter RM Young none	110-Martin Valvur-11/04/2021		

DAS Data Form 1.2 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Primary Environmental Sys 2026 LAV410 Martin Valvur 11/04/2021 DAS Das Date: 11/4 /2021 **Audit Date** 11/4 /2021 ΗY Parameter DAS Mfg 09:02:48 09:04:00 **Das Time: Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** 308 Das Day: 308 **Audit Day** Tfer ID 01322 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0002 0.0004 0.0002 0.0004 6/15/2014 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 95740243 Tfer Desc. DVM 01312 Tfer ID 1.00000 0.00000 **Slope** Intercept 2/11/2021 1.00000 CorrCoff **Cert Date** Channel Input DVM Output DAS Output InputUnit OutputUnit Difference 9 0.0000 V -0.0004-0.0003 0.0001 9 0.1000 0.1003 0.1002 V V -0.0001 9 0.3000 0.2998 0.2995 V V -0.0003 V V 9 0.5000 0.4997 0.4996 -0.0001 V 9 0.7000 V 0.0001 0.6999 0.7000 9 V V 0.9000 0.90000.8996 -0.0004 9 1.0000 0.9996 0.9995 V V -0.0001

Flow Data Form **Technician** Mfg Serial Number Tag Site Site Visit Date Parameter **Owner ID** Martin Valvur flow rate Tylan AW02213004 LAV410 11/04/2021 none Mfg BIOS Parameter Flow Rate Tylan Mfg 148613 Tfer Desc. BIOS 220-H **Serial Number** 00042 FP902022 **SN/Owner ID** 01421 Tfer ID MFC power supply **Parameter:** 0.00160 **Slope** 1.00850 Intercept 2/10/2021 0.99999 CorrCoff **Cert Date** 0.474 **DAS 1: DAS 2:** Cal Factor Zero 10.57 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 4.93% 5.16% 3.5 **Rotometer Reading:** Test type Input l/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignal PctDifference Desc. primary pump off 0.0000.000-0.270.00000.25 1/ml/m leak check 0.000 -0.26 0.00000.25 1/ml/m0.000 primary 0.0000 1/m 4.74% test pt 1 2.512 2.490 2.10 2.61 1/mprimary 2.500 2.480 2.10 0.0000 2.60 1/m4.88% primary test pt 2 1/m0.00005.16% test pt 3 2.506 2.480 2.10 2.61 1/m1/mprimary Sensor Component Leak Test Condition Status pass Sensor Component Tubing Condition **Condition** Good Status pass Sensor Component Filter Position **Condition** Good Status pass

Condition Clean and dry

Condition 4.0 cm

Condition 1.0 cm

Condition 25 deg

Condition See comments

Condition No moisture present

Status pass

Status pass

Status pass

Status pass

Status pass

Status pass

Sensor Component Rotometer Condition

Sensor Component Moisture Present

Sensor Component Filter Distance

Sensor Component Filter Depth

Sensor Component Filter Azimuth

Sensor Component System Memo

Ozone Data Form

Mfg	S	erial Numbe	er Tag Site		Tec	chnician	Site Visit Date	Parame	eter	Owner ID	
ThermoElectron	n Inc 4	19C-520012-3	328 LAV410)	Ma	artin Valvur	11/04/2021	Ozone		90834	
Slope:	1.0	01500 Slop	e: 0.00000		0 Mfg T		ThermoElectron	Inc Pa	ramete	ozone	
Intercept	-0.8	36732 Inte	rcept	0.00000		Serial Number	49CPS-70008-3	64 Tf	er Desc	Ozone primary stan	
CorrCoff:	0.9	99991 Cor	rCoff:	0.00000		Tfer ID	01110				
DAS 1:		D	AS 2:			Slope	1.0034	10 Inter	cent	0.02230	
A Avg % Diff:	A Ma	x % Dif A	Avg %Diff A	Max %	6 Dif	-	4/00/00/		•	4.00000	
0.0%		0.0%				Cert Date	1/20/202	21 Corr	·Coff	1.00000	
UseDescription	on C	ConcGroup	Tfer Raw	Tfe	er Corr	Site	Site Unit	RelPer	Dif	AbsDif	
primary		1	-0.09	-1	0.11	-0.14	ppb			-0.03	
primary		2	14.71	1	4.64	13.48	ppb			-1.16	
primary		3	36.77	3	6.63	35.92	ppb		-1.96		
primary		4	66.45	6	6.22	66.00	ppb		-0.33		
primary		5	109.49	10	09.12	110.30	ppb		1.08		
Sensor Com	ponent	Audit Pressi	ure		Condition	622 mmHg		Status	pass		
Sensor Com	ponent	26.6 degree	unobstructed ru	ıle	Condition	False		Status	Fail		
Sensor Com	ponent	Tree dewline	e >10m or below	v inlet	Condition	False		Status	us Fail		
Sensor Component ADT <100 vehicles further than 20			han 20	Condition 90 m			Status	§ Fail			
Sensor Com	ponent	ADT >100 v	ehicles further t	han 50	Condition	on 09 m		Status	Fail		
Sensor Com	ponent	Sample Trai	in		Condition	Good		Status	pass		
Sensor Com	ponent	Inlet Filter C	ondition		Condition	ondition Clean			Status pass		
Sensor Com	ponent	Offset			Conditio	ondition 0.000			Status pass		
Sensor Com	ponent	Span			Conditio	on 1.038		Status pass			
Sensor Com	ponent	Zero Voltage	е		Conditio	0.0003		Status	pass		
Sensor Com	ponent	Fullscale Vo	ltage		Conditio	on 1.0000		Status	pass		
Sensor Com	ponent	Cell A Freq.			Conditio	75.3 kHz		Status	pass		
Sensor Com	ponent	Cell A Noise)		Condition	0.5 ppb		Status	pass		
Sensor Com	ponent	Cell A Flow			Condition	0.68 lpm		Status	pass		
Sensor Com	ponent	Cell A Press	sure		Condition	601.1 mmHg		Status	pass		
Sensor Com	ponent	Cell A Tmp.			Condition	9n 42.8 C		Status	Fail		
Sensor Com	Sensor Component Cell B Freq.				Condition	86.2 kHz		Status	pass		
Sensor Com	ponent	Cell B Noise)		Condition	0.5 ppb		Status	pass		
Sensor Com	ponent	Cell B Flow			Condition	dition 0.62 lpm			pass		
Sensor Com	ponent	Cell B Press	sure		Condition	600.7 mmHg		Status	pass		
Sensor Com	ponent	System Mer	mo		Condition	See comments	3	Status	pass		

2 Meter Temperature Data Form Calc. Difference Serial Number Tag Site **Technician** Site Visit Date Parameter Mfg **Owner ID** LAV410 Martin Valvur 11/04/2021 RM Young 029458 Temperature2meter none Mfg Fluke Parameter Temperature 3275143 Tfer Desc. RTD **Serial Number** 01229 Tfer ID **Slope** 0.99975 **Intercept** -0.00824 **DAS 1: DAS 2:** 2/9/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err CorrCoff **Cert Date** 0.61 0.71 Difference UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Test type Temp Low Rang -0.010.00 0.00000.52 C 0.52 primary 24.49 0.0000 25.08 C 0.59 primary Temp Mid Range 24.48 Temp High Rang primary 47.01 47.03 0.0000 47.74C 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 Status pass **Condition**

Shelter Temperature Data For Mfg **Serial Number Tag Site Technician** Site Visit Date Parameter **Owner ID** ARS LAV410 Martin Valvur 11/04/2021 Shelter Temperature none none **DAS 1: DAS 2:** Parameter Shelter Temperature Mfg Fluke Abs Avg Err Abs Max Err Abs Avg Err **Abs Max Err** Tfer Desc. RTD 3275143 **Serial Number** 1.22 1.50 01229 **Tfer ID** 0.99975 -0.00824 **Slope** Intercept 2/9/2021 1.00000 **Cert Date** ${\bf CorrCoff}$

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.96	24.97	0.000	24.0	С	-0.94
primary	Temp Mid Range	25.81	25.82	0.000	24.3	С	-1.5
primary	Temp Mid Range	25.90	25.91	0.000	24.7	С	-1.22
Sensor Con	Sensor Component System Memo			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 25 m	Status	Fail
Sensor Component	System Memo	Condition	Status	pass
Sensor Component	Large parking lot	Condition	Status	pass

Infrastructure Data For Technician Martin Valvur LAV410 Site Visit Date 11/04/2021 Site ID **Shelter Make Shelter Model Shelter Size** 1150 cuft 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 Condition Installed Sensor Component Moisture Trap Status pass Status pass **Sensor Component** Moisture Trap Type Condition Glass bottle and filter Sensor Component Power Cables Status pass **Condition** Good **Condition** Functioning Sensor Component | Shelter Temp Control 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 Status pass **Condition** Good Sensor Component | Shelter Roof **Condition** Good Status pass Sensor Component | Shelter Floor **Condition** Good Status pass Sensor Component | Shelter walls **Condition** Good Status pass

Condition Good

Condition Good

Condition Good

Condition

Condition 3/8 teflon

Status pass

Status pass

Status pass

Status pass

Status pass

Sensor Component Excessive mold present

Sensor Component | Signal Cable

Sensor Component Tubing Type

Sensor Component Sample Train

Sensor Component System Memo

Site Visit Comments

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

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 Visit Date 11/04/2021 LAV410 Technician | Martin Valvur Site ID Manzanita Lake **USGS Map** NPS **Site Sponsor (agency)** Map Scale NPS **Operating Group Map Date** 06-065-1004 AQS# Climatronics **Meteorological Type** Ozone, IMPROVE 40.5403 Air Pollutant Analyzer **QAPP** Latitude dry, wet **QAPP** Longitude -121.5764 **Deposition Measurement** 1756 **Land Use** woodland - evergreen **QAPP Elevation Meters** Terrain complex **QAPP Declination** Marginally Conforms to MLM **OAPP Declination Date** (530) 335-7214 40.539991 **Site Telephone Audit Latitude** 38050 Hwy 36E -121.576462 Site Address 1 **Audit Longitude** Site Address 2 **Audit Elevation** 1755 14.5 Shasta **County Audit Declination** Mineral, CA City, State **Present** Fire Extinguisher 96063 Inspected August 2021 Zip Code Pacific **First Aid Kit** Time Zone **Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **Climbing Belt** Primary Op. E-mail **Backup Operator Security Fence V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail Shelter Working Room ✓ Make Model **Shelter Size** 1150 cuft **✓** Notes The inside equipment is located in room within the fire station, clean, neat, and organized. Shelter Clean **✓** Notes Site OK From Redding take route 44 east for approximately 45 miles. At the park, and intersection of 44 and 89, turn right **Driving Directions** 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.

Fi	eld Sy	stems Data Fo	orm				F-0205	58-1	500-S3	-rev002
Site	e ID	LAV410	Technician	Martin Valvur		Site Visit Date	11/04/2021			
1		d speed and direction fluenced by obstruction		o as to avoid	✓	N/A				
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 plu	✓	N/A						
4		temperature shields p diated heat sources su	✓							
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 so	lar radiation sensor p	lumb?		✓	✓ N/A				
7	Is it site	d to avoid shading, or	any artificial o	r reflected light?	✓	N/A				
8	Is the ra	in 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 inc	lined approximately 3	✓	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:

Fi	eld 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?	d 🗸
	ide any additional explanation (photograph or sketch if necessal or man-made, that may affect the monitoring parameters	essary) regarding conditions listed above, or any other features, s:

Field Systems Data Form F-02058-1500-S5-rev002 LAV410 Technician | Martin Valvur Site Visit Date 11/04/2021 Site ID Siting Criteria: Are the pollutant analyzers and deposition equipment sited in accordance with 40 CFR 58, Appendix E **~** Do the sample inlets have at least a 270 degree arc of unrestricted airflow? **~** Are the sample inlets 3 - 15 meters above the ground? < 10 meters Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees? Pollutant analyzers and deposition equipment operations and maintenance **~** Do the analyzers and equipment appear to be in good condition and well maintained? **~** Are the analyzers and monitors operational, on-line, and reporting data? Describe ozone sample tube. 1/4 teflon by 10 meters Describe dry dep sample tube. 3/8 teflon by 10 meters At inlet only Are in-line filters used in the ozone sample line? (if ves indicate location) **~** Are sample lines clean, free of kinks, moisture, and obstructions? **V** Is the zero air supply desiccant unsaturated? Flow line only Are there moisture traps in the sample lines? **✓** Clean and dry 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,

Provide any additional 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 Do the DAS instruments appear to be in good condition and well maintained? **V** Are all the components of the DAS operational? (printers, modem, backup, etc) Met sensors only Do the analyzer and sensor signal leads pass through lightning protection circuitry? **✓** Are the signal connections protected from the weather and well maintained? **✓** Are the signal leads connected to the correct DAS channel? Are the DAS, sensor translators, and shelter properly **~** grounded? **✓** Does the instrument shelter have a stable power source? **~** Is the instrument shelter temperature controlled? Grounded Stable Is the met tower stable and grounded? **V ✓** Is the sample tower stable and grounded? **V V** 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 LAV410 Technician | Martin Valvur Site Visit Date 11/04/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No Yes No N/A **✓ V** Wind speed sensor Data logger **V V** Wind direction sensor Data logger ✓ **V** П **Temperature sensor** Strip chart recorder **✓ V** Relative humidity sensor Computer **V** Solar radiation sensor **V** Modem П **V V Printer** Surface wetness sensor **V V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump ✓ **~ Humidity sensor translator Surge protector** П **V ~ UPS Solar radiation translator ~ V** Tipping bucket rain gauge **Lightning protection device** ~ **✓ Shelter heater** Ozone analyzer **V** ~ Filter pack flow controller Shelter air conditioner \checkmark Filter pack MFC power supply Does the site have the required and most recent QC documents and report forms? Present Current **Station Log ✓ V** DataView2 **SSRF ✓ V ✓ V** Site Ops Manual July 2012 **HASP** Field Ops Manual **Calibration Reports V V** Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ Are the Site Status Report Forms being completed and **V** current? Are the chain-of-custody forms properly used to document **V** sample transfer to and from lab? Control charts not used Are ozone z/s/p control charts properly completed and current? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S8-rev002 LAV410 Technician Martin Valvur Site Visit Date 11/04/2021 Site ID Site operation procedures Informal training provided by ARS during maintenance visits Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **V** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** Semiannually **Multipoint Calibrations V V** Weekly **Visual Inspections ✓ V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **Manual Rain Gauge Test V V** Weekly **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily **V V** Not performed Manual Zero/Span Tests **V ✓** Daily **Automatic Precision Level Tests V V Manual Precision Level Test** Not performed **V V** Alarm values only **Analyzer Diagnostics Tests V** Monthly **In-line Filter Replacement (at inlet) V V** N/A In-line Filter Replacement (at analyze Sample Line Check for Dirt/Water **Zero Air Desiccant Check ✓** Do multi-point calibration gases go through the complete sample train including all filters? **✓** Do automatic and manual z/s/p gasses go through the complete sample train including all filters? **✓** Dataview 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 inlet filter is changed and the sample line conditioned every two weeks or as needed.

Fic	eld Systems Data Form			F-02058-1500-S9-rev002
Site	LAV410 Tech	hnician Martin Valvur		Site Visit Date 11/04/2021
	Site operation procedures			
1	Is the filter pack being changed every	Tuesday as scheduled?	V	Filter changed between 11:00 and 13:00
2	Are the Site Status Report Forms bei correctly?	ng completed and filed	✓	
3	Are data downloads and backups bei scheduled?	ng performed as		No longer required
4	Are general observations being made	and recorded? How?	✓	SSRF, dataview
5	Are site supplies on-hand and replent fashion?	ished in a timely	✓	
6	Are sample flow rates recorded? How	v?	✓	SSRF
7	Are samples sent to the lab on a regulation?	lar schedule in a timely	✓	
8	Are filters protected from contamina and shipping? How?	tion during handling	✓	Clean gloves on and off
9	Are the site conditions reported reguloperations manager or staff?	larly to the field		
QC	Check Performed	Frequency		Compliant
N	Iulti-point MFC Calibrations	Semiannually		✓
F	low System Leak Checks	✓ Weekly		✓
F	ilter Pack Inspection			
Flow Rate Setting Checks Weekly			✓	
Visual Check of Flow Rate Rotometer ✓ Weekly			✓	
I	In-line Filter Inspection/Replacement ✓ Weekly			✓
S	ample Line Check for Dirt/Water	Weekly		✓
	ide any additional explanation (photograf or man-made, that may affect the			y) regarding conditions listed above, or any other features,

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	В	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
PED	0108-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	В	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 0.02 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Primary Campbell 2511 PED108 Korey Devins 11/10/2021 DAS Das Date: 11/10/2021 **Audit Date** 11/10/2021 Datel Parameter DAS Mfg 10:53:29 10:53:30 **Das Time: Audit Time** 15510194 Tfer Desc. Source generator (D **Serial Number** 314 314 Das Day: **Audit Day** Tfer ID 01320 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0001 0.0001 0.0002 0.0002 2/13/2012 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 95740135 Tfer Desc. DVM 01311 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/11/2021 1.00000 **Cert Date** CorrCoff Channel Input **DVM** Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V 0.0000 0.0000 0.00007 0.1000 0.0998 0.0999 V V 0.0001 7 0.3000 0.2997 0.2997 V V 0.0000V V 7 0.5000 0.4995 0.4995 0.0000V 0.7000 V -0.0001 7 0.6994 0.6993 V V 0.9000 0.8992 0.8991 -0.0001 7 1.0000 0.9992 0.9990 V V -0.0002

Flow Data Form **Technician Owner ID** Mfg **Serial Number Tag Site** Site Visit Date Parameter Korey Devins 11/10/2021 000527 Apex 48100 PED108 Flow Rate Mfg BIOS Parameter Flow Rate 131818 Tfer Desc. BIOS 220-H **Serial Number** 01417 Tfer ID -0.00058 **Slope** 0.99756 **Intercept** 2/10/2021 0.99993 CorrCoff **Cert Date** 0 **DAS 2: DAS 1:** Cal Factor Zero 1.01 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.45% 1.35% 1.5 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Test type Input l/m Input Corr MfcDisp. Desc. 1/mprimary pump off 0.000 0.0000.000.000-0.01 1/mleak check 0.000 0.000 0.00 0.000-0.02 1/ml/mprimary 1.49 0.000 1.49 1/m 0.00% test pt 1 1.481 1.490 1/mprimary 1.481 1.480 1.49 0.000 1.50 1/m1/m1.35% primary test pt 2 1.49 0.0001.49 1/m0.00% primary test pt 3 1.481 1.490 1/mSensor Component Leak Test Condition Status pass **Condition** Good Status pass **Sensor Component** Tubing Condition Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry 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

Condition 120 deg

Condition

Sensor Component Filter Azimuth

Sensor Component System Memo

Status pass

Status pass

Ozone Data Form

Intercept -0.05882 Intercept 0.00000 Serial Number 1180030022 Tfer Desc. Ozone primary stan	Mfg	S	erial Numbe	er Tag Site		Tec	chnician	Site Visit Date	Parame	eter	Owner ID
Intercept	ThermoElec	tron Inc	1105347319	PED108	3	Ko	orey Devins	11/10/2021	Ozone		000732
DAS 1: DAS 2: Slope 1.00030 Intercept D.30550	Slope:	1.	00697 Slop	e:	0.00000		Mfg	ThermoElectron	Inc Pa	ramete	rozone
DAS 1: DAS 2: Slope 1.00030 Intercept 0.30550	Intercept -0.05882 Intercept 0.00000		0.00000	Serial Number 1		1180030022	1180030022 Tfer Des		Ozone primary stan		
DAS 1: DAS 2: Slope 1.00030 Intercept 0.30550	CorrCoff:	0.	99999 Cor	rCoff:	0.00000		Tfer ID	01114			
A vg % Diff: A Max % Dif	DAS 1.		n	A S 2.					20 -		0.00550
UseDescription ConcGroup Tfer Raw Tfer Corr Site Site Unit RelPerDif AbsDif		iff∙ A Ma			May %	6 Dif	Slope	1.0003	30 Inter	cept	0.30550
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 True Status pass Sensor Component Tree dewline >10m or below inlet Condition True Status pass Sensor Component ADT >100 vehicles further than 20 Condition True Status pass Sensor Component ADT >100 vehicles further than 50 Condition True Status pass Sensor Component Sample Train Condition Clean Status pass Sensor Component Clear Condition Clean Status pass Sensor Component Sample Train Condition Clean Status pass Sensor Component Cell A Freq. Condition N/A Status pass Sensor Component Cell A Freq. Condition O.7 ppb Status pass Sensor Component Cell A Pressure Condition O.62 pm Status pass Sensor Component Cell A Tmp. Condition O.9 ppb Status pass Sensor Component Cell B Freq. Condition O.9 ppb Status pass Sensor Component Cell B Flow Condition O.9 ppb Status pass Sensor Component Cell B Freq. Condition O.9 ppb Status pass Condition O.9				Avg /tDIII A	· WIAX /	O DII	Cert Date	1/20/202	21 Corr	Coff	1.00000
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Sensor Component ADT >100 vehicles further than 50 Condition True Sensor Component Sample Train Condition Good Status pass Sensor Component Inlet Filter Condition Condition Clean Status pass Sensor Component Offset Condition In Indeed Inde		•									
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Sensor Component Cell B Pressure Condition 715.1 mmHg Status pass											
		-									
Status pass		•									
	Sensor C	omponen	System Mer	11U		Condition	ON		Status	pass	

Temperature Data Form Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Korey Devins RM Young 14041 PED108 11/10/2021 Temperature 06408 Mfg Extech Parameter Temperature Tfer Desc. RTD H232734 **Serial Number** 01227 Tfer ID 0.21666 **Slope** 1.00743 **Intercept DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 0.13 0.26 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.13 -0.09 0.0000.2 \mathbf{C} 0.26 24.7 C Temp Mid Range 25.06 24.66 0.000 0.02 primary 46.45 45.89 0.000 45.8 C primary Temp High Range -0.11 **Condition** Moderately clean Status pass Sensor Component | Shield **Condition** N/A Status pass **Sensor Component** Blower **Sensor Component** Properly Sited **Condition** Properly sited Status pass Sensor Component System Memo Status pass **Condition**

Shelter Temperature Data For Mfg Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Korey Devins Campbell none PED108 11/10/2021 Shelter Temperature none **DAS 1: DAS 2:** Parameter Shelter Temperature Mfg Extech Abs Avg Err Abs Max Err **Abs Avg Err Abs Max Err** Tfer Desc. RTD H232734 **Serial Number** 0.46 0.86 01227 Tfer ID 1.00743 0.21666 **Slope** Intercept 2/18/2021 1.00000 **Cert Date** CorrCoff OSE Unit Difference UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng primary Temp Mid Range 25.42 25.02 0.00025.9 \mathbf{C} 0.86 C Temp Mid Range 25.75 25.35 0.00025.8 0.41 primary C 26.50 26.09 0.000 0.12 primary Temp Mid Range 26.2 Status pass Sensor Component System Memo Condition

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 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	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 Visit Date 11/10/2021 Technician Korey Devins PED108 Site ID Green Bay **USGS Map EPA Site Sponsor (agency)** Map Scale Private **Operating Group Map Date** 51-147-9991 AQS# Climatronics **Meteorological Type** 37.1653 Air Pollutant Analyzer Ozone **QAPP** Latitude dry, wet **QAPP** Longitude -78.3070 **Deposition Measurement** 150 **Land Use** woodland - mixed **QAPP Elevation Meters** -9.1 Terrain rolling **QAPP Declination** Yes 2/22/2006 Conforms to MLM **OAPP Declination Date** 37.165222 **Site Telephone Audit Latitude** SR 629 -78.307067 Site Address 1 **Audit Longitude** Prince Edward-Gallion State Forest Site Address 2 **Audit Elevation** 149 Prince Edward -9.4 **County Audit Declination** Burkesville, VA City, State **Present** Fire Extinguisher 23922 No inspection date Zip Code Eastern **First Aid Kit** Time Zone **Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **V Climbing Belt** Primary Op. E-mail **Backup Operator Security Fence V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail Shelter Working Room ✓ Make Model 8810 (s/n 2116-13) Ekto **Shelter Size** 640 cuft **✓** Notes The shelter is in fair condition, clean, neat, and well organized. Shelter Clean **✓** Notes Site OK From Farmville travel east on 460 approximately 1 mile. Turn right (south) onto route 696 toward Twin Lakes State **Driving Directions** 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.

Fie	eld Sy	stems Data Fo	rm			F-02058-1500-S3-rev002
Site	e ID	PED108	Technician	Korey Devins		Site Visit Date 11/10/2021
1		d speed and direction : fluenced by obstructio		as to avoid	✓	N/A
2	(i.e. wind horizont	d sensors mounted so a d sensors should be mo ally extended boom >2 to the prevailing wind	ounted atop the 2x the max diar	tower or on a	✓	N/A
3		tower and sensors plu			✓	N/A
4		temperature shields po diated heat sources su			✓	
5	condition surface a	perature and RH sens ns? (i.e. ground below and not steeply sloped water should be avoid	sensors should Ridges, hollow	be natural	✓	
6	Is the so	lar radiation sensor pl	umb?		✓	N/A
7	Is it sited	l to avoid shading, or	any artificial o	r reflected light?	✓	N/A
8	Is the ra	in gauge plumb?			✓	N/A
9	Is it sited towers, o	I to avoid sheltering efetc?	ffects from buil	dings, trees,	✓	N/A
10	Is the su facing no	rface wetness sensor s orth?	ited with the gr	id surface	✓	N/A
11	Is it incl	ined 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:

d Systems Data Form		F-02058-1500-S4-rev002
PED108 Technician Korey Devins		Site Visit Date 11/10/2021
o all the meterological sensors appear to be intact, in good ondition, and well maintained?	✓	Temperature only
re all the meteorological sensors operational online, and eporting data?	✓	Temperature only
re the shields for the temperature and RH sensors clean?	✓	Moderately clean
re the aspirated motors working?	✓	N/A
the solar radiation sensor's lens clean and free of cratches?	✓	N/A
the surface wetness sensor grid clean and undamaged?	✓	N/A
re the sensor signal and power cables intact, in good ondition, and well maintained?	✓	
re the sensor signal and power cable connections protected om the elements and well maintained?	✓	
e any additional explanation (photograph or sketch if necess or man-made, that may affect the monitoring parameters:	ary)	regarding conditions listed above, or any other features,
	PED108 Technician Korey Devins o all the meterological sensors appear to be intact, in good ondition, and well maintained? re all the meteorological sensors operational online, and eporting data? re the shields for the temperature and RH sensors clean? re the aspirated motors working? the solar radiation sensor's lens clean and free of cratches? the surface wetness sensor grid clean and undamaged? re the sensor signal and power cables intact, in good ondition, and well maintained? re the sensor signal and power cable connections protected om the elements and well maintained? e any additional explanation (photograph or sketch if necess)	Deptition Technician Korey Devins of all the meterological sensors appear to be intact, in good ondition, and well maintained? re all the meteorological sensors operational online, and exporting data? re the shields for the temperature and RH sensors clean? re the aspirated motors working? the solar radiation sensor's lens clean and free of exactches? the surface wetness sensor grid clean and undamaged? re the sensor signal and power cables intact, in good ondition, and well maintained? re the sensor signal and power cable connections protected om the elements and well maintained? e any additional explanation (photograph or sketch if necessary)

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	PED108 Technician Korey Devins		Site Visit Date 11/10/2021
	Siting Criteria: Are the pollutant analyzers and deposition eq	uipı	nent 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	ma	intenance
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
Prov natu	vide any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	ary)	regarding conditions listed above, or any other features,

Field Systems Data Form

F-02058-1500-S6-rev002

Site	e ID	PED108	Technician Kon	rey Devins		Site Vis	it Date	11/10/202	1	
	DAS, se	nsor translators, and p	peripheral equipme	ent operation	s an	d maintena	nce			
1	1 Do the DAS instruments appear to be in good condition and well maintained?									
2	2 Are all the components of the DAS operational? (printers, modem, backup, etc)									
3		nnalyzer and sensor sig g protection circuitry?		ough	✓	Met sensors	only			
4		signal connections pro intained?	otected from the we	eather and	✓					
5	Are the	signal leads connected	to the correct DAS	S channel?	✓					
6	Are the grounde	DAS, sensor translato	rs, and shelter pro	perly	✓					
7	Does the	e instrument shelter ha	ave a stable power	source?	✓					
8	Is the in	strument shelter temp	erature controlled	?	✓					
9	Is the m	et tower stable and gr	ounded?			Stable			Grounded	
10	Is the sa	ample tower stable and	grounded?			<u> </u>			<u> </u>	
11	Tower o	comments?				Met tower re	emoved		<u>. </u>	
		additional explanationan-made, that may af				y) regardin	g conditi	ons listed	l above, or a	any other features,

Field Systems Data Fo	orm		F-0205	58-1500-S7-rev0
Site ID PED108	Technician Korey De	vins Site Visit Date	11/10/2021	
Documentation				
Does the site have the required	instrument and equipme	nt manuals?		
Vind speed sensor Vind direction sensor Cemperature sensor Relative humidity sensor colar radiation sensor urface wetness sensor Vind sensor translator Cemperature translator Iumidity sensor translator colar radiation translator Cipping bucket rain gauge Dzone analyzer Cilter pack flow controller Cilter pack MFC power supply		Data logger Data logger Strip chart recorder Computer Modem Printer Zero air pump Filter flow pump Surge protector UPS Lightning protection device Shelter heater Shelter air conditioner		
Does the site have the required		cuments and report forms?		
	resent		Current 🗸	
tation Log SRF	✓		✓	
ite Ops Manual				
[ASP	Jan, 2010			
ield Ops Manual				
Calibration Reports	✓ July 2016 ✓		✓	
Dzone z/s/p Control Charts				
reventive maintenance schedule				
Is the station log properly con Are the Site Status Report Fo				
current?	G 1			
Are the chain-of-custody forn sample transfer to and from l		ment 🗸		
Are ozone z/s/p control charts current?	properly completed and	Control charts not us	ed	
rovide any additional explanation atural or man-made, that may af			ons listed abo	ve, or any other features,

Field Systems Data Form F-02058-1500-S8-rev002 PED108 Technician Korey Devins Site Visit Date 11/10/2021 Site ID Site operation procedures Trained in FL in 1987 and refresher course in July 2006 Has the site operator attended a formal CASTNET training ✓ course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **V** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** N/A **Multipoint Calibrations V V** N/A **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **Manual Rain Gauge Test V V** N/A **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily **V V** As needed Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests V** As needed **Manual Precision Level Test V V** Weekly **Analyzer Diagnostics Tests ~** Every 2 weeks **In-line Filter Replacement (at inlet) V V** N/A In-line Filter Replacement (at analyze 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?

- 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?

	Unknown
✓	
✓	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:

Fi	Field Systems Data Form						F-02058-1500-S9-rev002				
Sit	e ID	PED108	echni	cian	Korey Devins		Site Visit Dat	e 11/10/20	021		
	Site ope	ration procedures									
1	Is the fi	ter pack being changed eve	ry T	uesda	y as scheduled	V	Fiter changed mor	inings			
2	Are the Site Status Report Forms being completed and filed correctly?					✓					
3	Are data	a downloads and backups bed?	eing	perfo	rmed as		No longer required				
4	Are gen	eral observations being ma	de an	d rec	orded? How?	✓	SSRF				
5	5 Are site supplies on-hand and replenished in a timely fashion?				✓						
6	Are san	ple flow rates recorded? H	ow?			✓	SSRF, call-in				
7	Are san	pples sent to the lab on a reg	gular	sched	dule in a timely	✓					
8		ers protected from contaminoping? How?	ıatioı	ı dur	ing handling	✓	Clean gloves on a	nd off			
9		site conditions reported reg ons manager or staff?	ularl	ly to t	he field	✓					
QC	Check P	erformed		Freq	uency			Compli	ant		
]	Multi-poi	nt MFC Calibrations	✓	Semi	iannually			✓			
]	Flow System Leak Checks Weekly				✓						
]	Filter Pac	k Inspection									
]	Flow Rate	Setting Checks	✓	Weel	kly			✓			
7	Visual Ch	ll Check of Flow Rate Rotometer ✓ Weekly				✓					
]	In-line Fil	ter Inspection/Replacement									
	Sample Li	ne Check for Dirt/Water	✓	Weel	kly			✓			
		dditional explanation (pho n-made, that may affect th					v) regarding condi	tions liste	d above, or	r any other features,	

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	В	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
CDF	R119-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	В	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 **Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Campbell 4935 CDR119 Korey Devins 11/11/2021 DAS Primary Das Date: 11/11/2021 **Audit Date** 11/11/2021 Datel Parameter DAS Mfg 12:47:00 12:47:00 **Das Time: Audit Time** 15510194 Tfer Desc. Source generator (D **Serial Number** 315 315 Das Day: **Audit Day** Tfer ID 01320 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0001 0.0001 0.0002 0.0002 2/13/2012 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 95740135 Tfer Desc. DVM 01311 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/11/2021 1.00000 **Cert Date** CorrCoff Channel Input **DVM** Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V -0.0001 0.0000 0.0001 7 0.1000 0.0998 0.0999 V V 0.0001 7 0.3000 0.2996 0.2997 V V 0.00017 V V 0.5000 0.4995 0.4996 0.0001 V 0.7000 V 0.0002 7 0.6994 0.6996 V V 0.9000 0.8993 0.8994 0.0001 7 1.0000 0.9991 0.9993 V V 0.0002

Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter CDR119 Korey Devins 11/11/2021 Flow Rate illegible Apex illegible Mfg BIOS Parameter Flow Rate 131818 Tfer Desc. BIOS 220-H **Serial Number** 01417 Tfer ID -0.00058 **Slope** 0.99756 **Intercept** 2/10/2021 0.99993 CorrCoff **Cert Date** -0.015 **DAS 2: DAS 1:** Cal Factor Zero 0.972 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 1.32% 1.32% 1.5 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. 1/mprimary pump off 0.000 0.000-0.01 0.000-0.021/mleak check 0.000 0.000 0.00 0.000-0.01 1/ml/mprimary 0.000 1/m -1.32% test pt 1 1.515 1.520 1.54 1.50 1/mprimary 1.520 1.54 0.000 1.50 1/m1/m-1.32% primary test pt 2 1.512 0.0001/m-1.32% primary test pt 3 1.512 1.520 1.54 1.50 1/mSensor Component Leak Test Condition Status pass **Condition** Good Status pass **Sensor Component** Tubing Condition Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry

Condition See comments

Condition 4.5 cm

Condition 1.5 cm

Condition 200 deg

Condition

Status pass

Status pass

Status pass

Status pass

Status pass

Sensor Component Moisture Present

Sensor Component Filter Distance

Sensor Component Filter Depth

Sensor Component Filter Azimuth

Sensor Component System Memo

Ozone Data Form

Mfg		Serial Numb	er Tag	Site		Technician		Site Visit Date	Parame	eter	Owner ID
ThermoElec	tron Inc	1030244807	'	CDR119)	Ko	orey Devins	11/11/2021	Ozone		000705
Slope: Intercept CorrCoff:			pe: ercept rrCoff:	O	0.0000.0	Serial Number		ThermoElectron 1180030022 01114			ozone c. Ozone primary stan
DAS 1:		П	DAS 2:					1.0003	30 Into		0.30550
	oiff: A M	1ax % Dif A		Diff A	Max %	% Dif	Slope			сері	
	0%	0.0%					Cert Date	1/20/20	21 Corr	·Coff	1.00000
UseDescr	iption	ConcGroup	Tfeı	Raw	Tf	er Corr	Site	Site Unit	RelPer	Dif	AbsDif
prima		1	0	.34		0.03	0.54	ppb			0.51
prima	•	2	15	5.96		15.58	15.14	ppb			-0.44
prima	•	3		5.83		35.37	34.54	ppb		-2.37	
prima	•	4		3.56		57.96	66.60	ppb		-2.02	
prima	•	5		2.72		11.94	109.90	ppb		-1.84	
		nt Audit Pres		- 1			on 738.1 mmHg		Status		
Sensor C	ompone	nt 26.6 degre	e unobst	ructed rul	le	Conditi	on True		Status	pass	
Sensor C	ompone	nt Tree dewli	ne >10m	or below	inlet	Conditi	on True		Status	pass	
Sensor C	ompone	nt ADT <100	vehicles	further th	an 20	Condition 31 m			Status	atus Fail	
Sensor C	ompone	nt ADT >100	vehicles	further th	an 50	Conditi	on 31 m		Status	Fail	
Sensor C	ompone	nt Sample Tr	ain			Condition	on Good		Status	pass	
Sensor C	ompone	nt Inlet Filter	Condition	ı		Condition	on Clean		Status	pass	
Sensor C	ompone	nt Offset				Condition	on -0.1		Status	pass	
Sensor C	ompone	nt Span				Condition 1.005			Status	pass	
Sensor C	ompone	nt Zero Volta	ge			Condition	Condition N/A			pass	
Sensor C	ompone	nt Fullscale V	oltage			Condition N/A			Status	pass	
Sensor C	ompone	nt Cell A Fred	٦.			Condition	on 92.8 kHz		Status	pass	
Sensor C	ompone	nt Cell A Nois	se			Condition	ondition 0.4 ppb			pass	
Sensor C	ompone	nt Cell A Flow	V			Condition	on 0.48 lpm		Status	pass	
Sensor C	Sensor Component Cell A Pressure		Condition	718.8 mmHg		Status	pass				
Sensor C	Sensor Component Cell A Tmp.		Condition	on 36.2 C		Status	pass				
Sensor C	ensor Component Cell B Freq.		Condition	on 97.8 kHz		Status	pass				
Sensor C	Sensor Component Cell B Noise		Condition	0.6 ppb		Status	pass				
Sensor C	ompone	nt Cell B Flow	V			Condition	on 0.50 lpm		Status	pass	
Sensor C	ompone	nt Cell B Pres	ssure			Condition	ondition 719.4 mmHg			pass	
Sensor C	ompone	nt System Me	emo			Conditi	on		Status	pass	

Temperature Data Form Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Korey Devins RM Young 4546 CDR119 11/11/2021 Temperature 04448 Mfg Extech Parameter Temperature Tfer Desc. RTD H232734 **Serial Number** 01227 Tfer ID 0.21666 **Slope** 1.00743 **Intercept DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 0.25 0.33 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.30 0.08 0.0000.4 \mathbf{C} 0.33 C Temp Mid Range 27.01 26.60 0.000 26.5 -0.12 primary 46.37 45.81 0.000 C -0.29 primary Temp High Range 45.5 **Condition** Moderately clean Status pass Sensor Component | Shield **Condition** N/A Status pass **Sensor Component** Blower Sensor Component Properly Sited **Condition** Properly sited Status pass Sensor Component System Memo Status pass **Condition**

Shelter Temperature Data For Mfg Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Korey Devins Campbell none CDR119 11/11/2021 Shelter Temperature none **DAS 1: DAS 2:** Parameter Shelter Temperature Mfg Extech Abs Avg Err Abs Max Err **Abs Avg Err Abs Max Err** Tfer Desc. RTD H232734 **Serial Number** 0.26 0.36 01227 Tfer ID 1.00743 0.21666 **Slope** Intercept 2/18/2021 1.00000 **Cert Date** CorrCoff OSE Unit Difference UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng primary Temp Mid Range 27.55 27.13 0.00027.3 \mathbf{C} 0.19 27.2 C

0.000

0.000

0.36

0.22

C

Status pass

28.0

26.88

27.81

Condition

Temp Mid Range

Temp Mid Range

Sensor Component System Memo

primary

primary

27.30

28.23

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	CDR119	Technician	Korey Devins	Site Visit Date	11/11/2021
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Shelter Make	Shelter Model	Shelter Size	
Ekto	8810	640 cuft	

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

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.

F-02058-1500-S1-rev002 Field Systems Data Form Site Visit Date 11/11/2021 CDR119 Technician Korey Devins Site ID Glenville **USGS Map EPA** Site Sponsor (agency) Map Scale private, WV parks dept **Operating Group Map Date** 54-021-9991 AQS# Climatronics **Meteorological Type** Ozone Air Pollutant Analyzer **QAPP** Latitude **Deposition Measurement** dry, wet **QAPP** Longitude woodland - mixed **Land Use QAPP Elevation Meters** complex Terrain **QAPP Declination** No Conforms to MLM **OAPP Declination Date** 38.879503 **Site Telephone Audit Latitude** Cedar Creek St. Park -80.847677 Site Address 1 **Audit Longitude** 240 Site Address 2 **Audit Elevation** Gilmer **County Audit Declination** Glenville, WV City, State **Present** Fire Extinguisher 26351 Inspected Oct 2015 Zip Code Eastern First Aid Kit Time Zone **✓ Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **✓** Primary Op. E-mail **Climbing Belt Backup Operator Security Fence ~** Backup Op. Phone # **Secure Shelter** Stable Entry Steps ✓ Backup Op. E-mail **Shelter Working Room** ✓ **Make** Model 8810 640 cuft Ekto **Shelter Size** ✓ Notes The shelter is in fair condition with some rot on the walls below the air conditioner. **Shelter Clean**

✓ Notes

Site OK

Driving Directions

Fie	eld Systems Data Form		F-02058-1500-S3-rev002
Site	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:

Fi	eld Systems Data Form	F-02058-1500-S4-rev002
Site	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?	
	ride any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	sary) regarding conditions listed above, or any other features,

Field Systems Data Form						F-02058-1500-S5-rev002					
Sit	e ID	CDR119 Technician Korey Devins			Site Visit Date						
	Siting (Criteria: Are the pollut	ant analyzers a	nd deposition eq	<u>uipr</u>	nent sited in accord	dance with 40	CFR 58.	Appendix E		
1		sample inlets have at le	east a 270 degre	e arc of	✓						
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 tree	es				
	Polluta	nt analyzers and depos	ition equipmen	t operations and	ma	<u>intenance</u>					
1		Do the analyzers and equipment appear to be in good condition and well maintained?									
2		analyzers and monitoning data?	rs operational,	on-line, and	✓						
3	Describ	e ozone sample tube.				1/4 teflon by 12 me	ters				
4	Describ	e dry dep sample tube.				3/8 teflon by 12 me	ters				
5		Are in-line filters used in the ozone sample line? (if yes indicate location)				At inlet only					
6	Are san	nple lines clean, free of tions?	kinks, moistur	e, and	✓						
7	Is the z	ero air supply desiccan	t unsaturated?		✓						
8	Are the	re moisture traps in th	e sample lines?		✓						
9	Is there clean?	a rotometer in the dry	deposition filto	er line, and is it	✓	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	e ID	CDR119	Technician	Korey Devins		Site Visi	it Date 11/11	/2021			
DAS, sensor translators, and peripheral equipment operations and maintenance											
1											
2	Are all t	he components of the backup, etc)	DAS operationa	al? (printers,	✓						
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?					Temperature	e 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	Does the instrument shelter have a stable power source?									
8	Is the instrument shelter temperature controlled?				✓						
9	Is the m	et tower stable and gr	ounded?			Stable		Grounded			
10	Is the sample tower stable and grounded?				<u>✓</u>		<u> </u>				
11	1 Tower comments?					Met tower removed					
	Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,										
nat	ural or m	an-made, that may af	fect the monitor	ring parameters	s:						

Field Systems D	F-02	F-02058-1500-S7-rev002									
Site ID CDR119		Technician Korey Devins Site Visit Date		Date 11/11/2021	1						
<u>Documentation</u>											
Does the site have the required instrument and equipment manuals?											
Wind speed sensor Wind direction sensor Temperature sensor Relative humidity sensor Solar radiation sensor Surface wetness sensor Wind sensor translator Temperature translator Humidity sensor translator Solar radiation translator Tipping bucket rain gauge Ozone analyzer Filter pack flow controller Filter pack MFC power se	e		Data l Strip Comp Mode Printe Zero a Filter Surge UPS Light Shelte	ogger chart recorder uter m r dir pump flow pump protector ding protection do r heater r air conditioner	□						
	Pres	ent			Curre	ent					
Station Log	[~			✓						
SSRF	[✓			✓						
Site Ops Manual		✓ March 2015									
HASP		✓ March 2015									
Field Ops Manual		✓ March 2015									
Calibration Reports	[✓			✓						
Ozone z/s/p Control Char	ts [
Preventive maintenance s	chedule										
 Is the station log project Are the Site Status R 			- -								
current? 3 Are the chain-of-custody forms properly used to document sample transfer to and from lab? ✓											
4 Are ozone z/s/p contr current?			pleted and	Control charts i	not used						
Provide any additional ex				ary) regarding co	nditions listed	above, or a	ny other features,				

Field Systems Data Form F-02058-1500-S8-rev002 CDR119 Technician Korey Devins Site Visit Date 11/11/2021 Site ID Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **~** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** N/A **Multipoint Calibrations V V** N/A **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **Manual Rain Gauge Test V V** N/A **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily **V** Manual Zero/Span Tests **✓ V** Daily **Automatic Precision Level Tests V Manual Precision Level Test ✓ V** Weekly **Analyzer Diagnostics Tests ~ ✓** Every 2 weeks **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V V** Weekly Sample Line Check for Dirt/Water **~ V** Weekly **Zero Air Desiccant Check** Unknown Do multi-point calibration gases go through the complete sample train including all filters? **✓** Do automatic and manual z/s/p gasses go through the complete sample train including all filters? **✓** Logbook, call-in 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:

Fi	eld Sy	stems Data Forn	1				F-02058	8-1500-S9-rev002
Site	e ID	CDR119 T	echnicia	Korey Devins		Site Visit Dat	e 11/11/2021	
	Site ope	ration procedures						
1	Is the fi	ter pack being changed eve	ery Tue	sday as scheduled	?	Filter changed after	ernoons	
2	Are the Site Status Report Forms being completed and filed correctly?			✓				
3	Are data	a downloads and backups led?	eing pe	erformed as		No longer required		
4	Are gen	eral observations being ma	de and	recorded? How?	✓	SSRF, logbook		
5	5 Are site supplies on-hand and replenished in a timely fashion?			✓				
6	Are san	ple flow rates recorded? H	low?		✓	SSRF, logbook, call-in		
7	Are sam	uples sent to the lab on a re	gular sc	hedule in a timely	✓			
8		ers protected from contami oping? How?	nation (luring handling	✓	Clean gloves on a	nd off	
9		site conditions reported reported reports manager or staff?	gularly	to the field	✓			
QC	Check P	erformed	F	requency			Compliant	
N	Multi-poi	nt MFC Calibrations	✓ S	emiannually			✓	
I	Flow System Leak Checks Weekly			V				
I	Filter Pack Inspection							
I	Flow Rate Setting Checks				✓			
1	Visual Check of Flow Rate Rotometer Weekly					✓		
I	In-line Filter Inspection/Replacement ✓ Semiannually				✓			
S	Sample Line Check for Dirt/Water ✓ Weekly					\checkmark		
		dditional explanation (pho n-made, that may affect th) regarding condi	tions listed above	, or any other features,

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	В	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	В	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 0 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Campbell 2112 PAR107 Korey Devins 11/12/2021 DAS Primary Das Date: 11/12/2021 **Audit Date** 11/12/2021 Datel Parameter DAS Mfg 11:51:30 11:51:30 **Das Time: Audit Time** 15510194 Tfer Desc. Source generator (D **Serial Number** 316 316 Das Day: **Audit Day** Tfer ID 01320 **High Channel: Low Channel: Avg Diff: Avg Diff: Max Diff: Max Diff:** 1.00000 0.00000 **Slope** Intercept 0.0001 0.0001 0.0001 0.0001 2/13/2012 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 95740135 Tfer Desc. DVM 01311 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/11/2021 1.00000 **Cert Date** CorrCoff Channel Input DVM Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V -0.0001 0.0000 0.0001 7 0.1000 0.0998 0.0999 V V 0.0001 7 0.3000 0.2996 0.2997 V V 0.00017 V V 0.5000 0.4996 0.4996 0.0000V 0.7000 V 0.00007 0.6994 0.6994 V V 0.9000 0.8993 0.8992 -0.0001 7 1.0000 0.9992 0.9992 V V 0.0000

Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter PAR107 Korey Devins 11/12/2021 Flow Rate 000596 Apex illegible Mfg BIOS Parameter Flow Rate 131818 Tfer Desc. BIOS 220-H **Serial Number** 01417 Tfer ID -0.00058 **Slope** 0.99756 **Intercept** 2/10/2021 0.99993 CorrCoff **Cert Date** 0.003 **DAS 2: DAS 1:** Cal Factor Zero 0.995 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.66% 0.66% 1.5 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. 1/mprimary pump off 0.000 0.0000.00 0.0000.001/mleak check 0.000 0.000 -0.01 0.000-0.03 1/ml/mprimary 1.50 0.000 1/m -0.66% test pt 1 1.505 1.510 1.50 1/mprimary 1.504 1.510 1.50 0.000 1.50 1/m1/m-0.66% primary test pt 2 0.0001/m-0.66% primary test pt 3 1.504 1.510 1.50 1.50 1/mSensor Component Leak Test Condition Status pass **Condition** Good Status pass **Sensor Component** Tubing Condition Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry 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

Condition 120 deg

Condition

Sensor Component Filter Azimuth

Sensor Component System Memo

Status pass

Status pass

Ozone Data Form

Mfg	Serial Numbe	er Tag Site	T	echnician	Site Visit Date	Parameter	Owner ID
ThermoElectron In	1009241792	PAR107	' H	Korey Devins	11/12/2021	Ozone	000624
Slope:	0.98329 Slop	e: (0.00000	Mfg	ThermoElectron	Inc Paramet	er ozone
Intercept	-0.46557 Inte	rcept	0.00000	Serial Number	1180030022	Tfer Des	c. Ozone primary stan
CorrCoff:	0.99996 Cor	rCoff:	0.00000	Tfer ID	01114		
DAC 1.	D	A G 2.					
DAS 1:		AS 2:	May 0/ D:f	Slope	1.0003	30 Intercept	0.30550
A Avg % Diff: A 0.0%	0.0%	Avg %Dill A	Max % DII	Cert Date	1/20/202	21 CorrCoff	1.00000
		TC D	TC C	G.,	G., II .,	D ID D'C	41 D'C
UseDescription	ConcGroup	Tfer Raw 0.43	Tfer Corr 0.12	Site -0.21	Site Unit	RelPerDif	AbsDif -0.33
primary primary	2	15.62	15.25	14.37	ppb		-0.88
primary	3	34.45	34.00	33.31	ppb	-2.05	-0.88
primary	4	66.16	65.57	63.41	**	-3.35	
			108.35		ppb		
primary Sonsor Composi	5 nent Audit Pressi	109.12		106.35 tion 716 mmHg	ppb	-1.86 Status pass	
_							
	nent 26.6 degree			tion True		Status pass	
Sensor Compo	nent Tree dewline	e >10m or below	inlet Condi	True		Status pass	
Sensor Compo	nent ADT <100 v	ehicles further th	nan 20 Condi	tion 125 m		Status Fail	
Sensor Compo	nent ADT >100 v	ehicles further th	nan 50 Condi	tion 363 m		Status Fail	
Sensor Compo	nent Sample Tra	in	Condi	tion Good		Status pass	
Sensor Compo	nent Inlet Filter C	ondition	Condi	tion Clean		Status pass	
Sensor Compo	nent Offset		Condi	tion -0.1		Status pass	
Sensor Compo	nent Span		Condi	1.006		Status pass	
Sensor Compo	nent Zero Voltag	е	Condi	Condition N/A		Status pass	
Sensor Compo	nent Fullscale Vo	ltage	Condi	tion N/A		Status Pass	
Sensor Compon	nent Cell A Freq.		Condi	tion 102.3 kHz		Status pass	
Sensor Compon	nent Cell A Noise	•	Condi	tion 0.6 ppb		Status pass	
Sensor Compo	nent Cell A Flow		Condi	tion 0.71 lpm		Status pass	
Sensor Compo	nent Cell A Press	sure	Condi	tion 684.6 mmHg		Status pass	
Sensor Compo	nent Cell A Tmp.		Condi	tion 32.7 C		Status pass	
Sensor Compo	Sensor Component Cell B Freq.		Condi	tion 103.9 kHz		Status pass	
Sensor Compo	nent Cell B Noise)	Condi	tion 0.9 ppb		Status pass	
Sensor Compo	nent Cell B Flow		Condi	tion 0.72 lpm		Status pass	
Sensor Compo	nent Cell B Press	sure	Condi	tion 685.2 mmHg		Status pass	
Sensor Compo	nent System Mer	no	Condi	tion		Status pass	

Temperature Data Form Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Korey Devins RM Young 4013 PAR107 11/12/2021 Temperature 04316 Mfg Extech Parameter Temperature Tfer Desc. RTD H232734 **Serial Number** 01227 Tfer ID 0.21666 **Slope** 1.00743 **Intercept DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 0.08 0.10 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.15 -0.070.0000.0 \mathbf{C} 0.09 26.70 26.2 C Temp Mid Range 26.29 0.000 -0.1 primary 47.26 46.70 0.000 C 0.06 primary Temp High Range 46.8 Status pass Sensor Component | Shield **Condition** Clean **Condition** N/A Status pass **Sensor Component** Blower Sensor Component Properly Sited **Condition** Properly sited Status pass Sensor Component System Memo Status pass **Condition**

Shelter Temperature Data For Mfg Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Korey Devins Campbell none PAR107 11/12/2021 Shelter Temperature none **DAS 1: DAS 2:** Parameter Shelter Temperature Mfg Extech Abs Avg Err Abs Max Err **Abs Avg Err Abs Max Err** Tfer Desc. RTD H232734 **Serial Number** 0.46 0.86 01227 Tfer ID 1.00743 0.21666 **Slope** Intercept 2/18/2021 1.00000 **Cert Date** CorrCoff OSE Unit Difference UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng primary Temp Mid Range 20.02 19.66 0.00020.5 \mathbf{C} 0.86 21.26 21.0 C Temp Mid Range 20.89 0.0000.1 primary C 24.30 23.91 0.000 24.3 0.41 primary Temp Mid Range

Condition

Sensor Component System Memo

Status pass

Siting Criteria Form

Sensor Component City > 50,000 Condition Status pass Sensor Component City 1,000 to 10,000 Condition 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 Secondary road < or = 100 per da	Sensor Component	Limited agriculture operations	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 Secondary road or = 100 per da Condition 125 m Status Fail Sensor Component Secondary road or = 100 vehicles/da Condition Status Fail Sensor Component Small parking lot Condition Status pass Sensor Component System Memo Condition Status pass	Sensor Component	City > 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	Sensor Component	City 1,000 to 10,000	Condition 2.5 km	Status	Fail
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	Sensor Component	City 10,000 to 50,000	Condition	Status	pass
Sensor ComponentLarge point source of So2 or NoxConditionStatuspassSensor ComponentMajor highway, airport, or rail yardConditionStatuspassSensor ComponentMajor industrial sourceConditionStatuspassSensor ComponentSecondary road < or = 100 per da	Sensor Component	Feedlot operations	Condition	Status	pass
Sensor ComponentMajor highway, airport, or rail yardConditionStatuspassSensor ComponentMajor industrial sourceConditionStatuspassSensor ComponentSecondary road < or = 100 per da	Sensor Component	Intensive agriculture operations	Condition	Status	pass
Sensor Component Major industrial source Condition Status pass Sensor Component Secondary road < or = 100 per da	Sensor Component	Large point source of So2 or Nox	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 Fail Sensor Component Small parking lot Condition Status pass Sensor Component System Memo Condition Status pass	Sensor Component	Major highway, airport, or rail yard	Condition	Status	pass
Sensor Component 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	Major industrial source	Condition	Status	pass
Sensor Component Small parking lot Condition Status pass Sensor Component System Memo Condition Status pass	Sensor Component	Secondary road < or = 100 per da	Condition 125 m	Status	Fail
Sensor Component System Memo Condition Status pass	Sensor Component	Secondary road >100 vehicles/da	Condition 363 m	Status	Fail
	Sensor Component	Small parking lot	Condition	Status	pass
Sensor Component Large 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 PA	AR107	Technician	Korey Devins	Site Visit Date	11/12/2021
------------	-------	------------	--------------	-----------------	------------

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component	Sample Tower Type	Condition	Туре В	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 PAR107 Site Visit Date 11/12/2021 Technician Korey Devins Site ID Parsons **USGS Map** EPA/USFS Site Sponsor (agency) Map Scale USFS **Operating Group Map Date** 54-093-9991 AQS# Climatronics **Meteorological Type** Air Pollutant Analyzer Ozone **QAPP** Latitude **Deposition Measurement** dry, wet **QAPP** Longitude woodland - mixed **Land Use QAPP Elevation Meters** complex Terrain **QAPP Declination** No Conforms to MLM **OAPP Declination Date** 39.090434 **Site Telephone Audit Latitude** USFS Timber & Watershed Lab -79.661742 Site Address 1 **Audit Longitude** Rt. 219, Nursery Bottom Site Address 2 **Audit Elevation** 510 Parsons **County Audit Declination** Parsons, WV City, State **Present** Fire Extinguisher 26287 Inspected July 2018 **Zip Code** Eastern First Aid Kit Time Zone **✓ Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **Climbing Belt** Primary Op. E-mail **V Security Fence Backup Operator V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail **Shelter Working Room** ✓ **Make** Model 8810 Ekto **Shelter Size** 640 cuft **✓** Notes The shelter is in good condition, clean, neat, and well organized. **Shelter Clean**

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.

✓ Notes

Site OK

Driving Directions

Fi	eld Systems Data Form		F-02058-1500-S3-rev002
Site	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?	V	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:

Fi	eld Systems Data Form	F-02058-1500-S4-rev002
Site	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?	
	ide any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	ssary) regarding conditions listed above, or any other features, :

Fi	eld Systems Data Form		F-02058-1500-S5-rev002			
Site	PAR107 Technician Korey Devins		Site Visit Date 11/12/2021			
	Siting Criteria: Are the pollutant analyzers and deposition eq	uipr	nent 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	mai	intenance			
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			
	ride any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	ary)	regarding conditions listed above, or any other features,			

Field Systems Data Form

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Site	ID	PAR107	Technician	Korey Devins		Site Visi	it Date 11/12/202	1	
	DAS, sei	nsor translators, and p	peripheral equip	ment operation	ıs ar	ıd maintena	nce		
1	Do the D	AS instruments appea		_	✓				
2		he components of the backup, etc)	DAS operationa	l? (printers,	✓				
3		nalyzer and sensor sig gprotection circuitry?		nrough	✓	Met sensors	only		
4		signal connections prontained?	tected from the	weather and	✓				
5	Are the	signal leads connected	to the correct D	OAS channel?	✓				
6	Are the grounde	DAS, sensor translatord?	rs, and shelter p	roperly	✓				
7	Does the	instrument shelter ha	ive a stable pow	er source?	✓				
8	Is the in	strument shelter temp	erature controll	ed?	✓				
9	Is the mo	et tower stable and gro	ounded?			Stable		Grounded	
10	Is the sa	mple tower stable and	grounded?						
11	Tower co	omments?				Met tower re	emoved		
Pro	vide env	additional explanation	n (nhatagranh a	r sketch if nece	ccor	v) regarding	a conditions lister	l ahove or e	ny other features
		an-made, that may af				y) regarding	g continuits lister	i above, of a	my other reatures,

Field Systems Data Form F-02058-1500-S7-rev002 PAR107 Technician Korey Devins Site Visit Date 11/12/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No No N/A Yes **✓** Wind speed sensor Data logger П **V V** Wind direction sensor Data logger ✓ **V** П **Temperature sensor** Strip chart recorder **V V** Relative humidity sensor Computer **V** Solar radiation sensor **V** Modem П **V V Printer** Surface wetness sensor **V V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump **V ~ Humidity sensor translator Surge protector ✓** П П **~ UPS Solar radiation translator V** Tipping bucket rain gauge **Lightning protection device** ~ **V Shelter heater** Ozone analyzer **V ✓** 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 V V SSRF ✓ V ✓** Site Ops Manual March 2015 **V V HASP** March 2015 **✓** Field Ops Manual March 2015 **Calibration Reports V ✓** Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ Minimal information Are the Site Status Report Forms being completed and **V** current? Are the chain-of-custody forms properly used to document **V** sample transfer to and from lab? Control charts not used Are ozone z/s/p control charts properly completed and current? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S8-rev002 PAR107 Technician Korey Devins Site Visit Date 11/12/2021 Site ID Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **~** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** N/A **Multipoint Calibrations V V** N/A **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **Manual Rain Gauge Test V V** N/A **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily **V V** As needed Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests V** As needed **Manual Precision Level Test ✓ V** Weekly **Analyzer Diagnostics Tests ~** Every 2 weeks **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V V** Weekly Sample Line Check for Dirt/Water **~ V** Weekly **Zero Air Desiccant Check V** Do multi-point calibration gases go through the complete sample train including all filters? **✓** Do automatic and manual z/s/p gasses go through the complete sample train including all filters? ✓ Call-in only Are the automatic and manual z/s/p checks monitored and

Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,

reported? If yes, how?

natural or man-made, that may affect the monitoring parameters:

Fi	eld Sy	stems Data For	m				F-0205	8-1500-S9-rev002		
Site	e ID	PAR107	Technician	Korey Devins		Site Visit Dat	e 11/12/2021			
	Site ope	ration procedures								
1	Is the fil	ter pack being changed e	every Tuesd	ay as scheduled	? ✓	Filter changed mo	rnings 90%			
2	Are the correctl	Site Status Report Form	s being com	pleted and filed	✓					
3	Are data	a downloads and backuped?	s being perf	formed as		No longer required				
4	Are gen	eral observations being n	nade and re	corded? How?	✓	SSRF				
5	Are site fashion?	supplies on-hand and re	plenished ir	a timely	✓					
6	Are sample flow rates recorded? How?					SSRF, call-in				
7	Are sam	pples sent to the lab on a	regular sch	edule in a timely	✓					
8		ers protected from contar oping? How?	nination du	ring handling	✓	Clean gloves on and off				
9		site conditions reported ions manager or staff?	regularly to	the field	✓					
QC	Check Po	erformed	Fre	equency			Compliant			
N	Multi-poii	nt MFC Calibrations	✓ Ser	niannually			✓			
F	Flow Syste	em Leak Checks	✓ We	ekly			✓			
I	Filter Pac	k Inspection								
I	Flow Rate	Setting Checks	✓ We	ekly			✓			
1	Visual Check of Flow Rate Rotometer Weekly						✓			
I	In-line Filter Inspection/Replacement Semiannually						✓			
S	Sample Li	ne Check for Dirt/Water								
		dditional explanation (pl n-made, that may affect				y) regarding condi	tions listed above	e, or any other features,		

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	<u> </u> 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	В	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	S	erial Numbe	er Tag Site		Te	chnician	Site Visit Date	Parame	eter	Owner ID
ThermoElectron	n Inc 1	1030244799	MKG11	3	Er	ic Hebert	11/29/2021	Ozone		000702
Slope:	1.0	01421 Slop	e:	0.00000		Mfg	ThermoElectron	Inc Pa	ramete	ozone
Intercept	0.	19975 Inte	rcept	0.00000		Serial Number	1180930075	Tf	er Desc	Ozone primary stan
CorrCoff:	1.0	00000 Cor	rCoff:	0.00000		Tfer ID	01115			
DAS 1:		D	AS 2:			Slope	1.0056	00 Inter	·cent	0.14070
A Avg % Diff:	: A Ma	x % Dif A	Avg %Diff A	Max %	6 Dif	•		_	•	
0.0%		0.0%				Cert Date	4/7/202	21 Corr	Coff	0.99990
UseDescripti	on C	ConcGroup	Tfer Raw	Tfe	er Corr	Site	Site Unit	RelPer	Dif	AbsDif
primary		1	0.33	(0.18	0.47	ppb			0.29
primary		2	17.52	1	7.05	17.54	ppb			0.49
primary		3	36.64	3	5.82	36.44	ppb		1.72	
primary		4	67.41	6	6.02	66.98	ppb		1.44	
primary		5	109.81	10	07.64	109.50	ppb		1.71	
Sensor Com	ponent					725.3 mmHg	FF-	Status		
Sensor Com	ponent	26.6 degree	unobstructed ru	ıle	Condition	on True		Status	pass	
			e >10m or belov		Condition	on True		Status	pass	
	•		ehicles further t					Status		
	•		ehicles further t					Status		
Sensor Com	•					on Good		Status		
Sensor Com	•					on Clean		Status		
Sensor Com	_		onanion		Condition			Status		
	•									
Sensor Com	•					1.013		Status		
Sensor Com					Condition			Status		
Sensor Com	•				Condition			Status		
Sensor Com	ponent	Cell A Freq.				93.2 kHz		Status		
Sensor Com	ponent	Cell A Noise)		Condition	on 1.5 ppb		Status		
Sensor Com	ponent	Cell A Flow			Condition	0.69 lpm		Status	pass	
Sensor Com	ponent	Cell A Press	sure		Condition	691.3 mmHg		Status	pass	
Sensor Com	ponent	Cell A Tmp.			Condition	on 34.6 C		Status	pass	
Sensor Com	ponent	Cell B Freq.			Condition	on 90.2 kHz		Status	pass	
Sensor Com	ponent	Cell B Noise)		Condition	on 1.3 ppb		Status	pass	
Sensor Com	ponent	Cell B Flow			Condition	0.69 lpm		Status	pass	
Sensor Com	ponent	Cell B Press	sure		Condition	on 691.9 mmHg		Status	pass	
Sensor Com	ponent	System Mer	no		Condition	on		Status	pass	

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
QAI	K172-Eric H	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	В	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 0.02 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Campbell 2508 QAK172 Eric Hebert 11/30/2021 DAS Primary Das Date: 11/30/2021 **Audit Date** 11/30/2021 Datel Parameter DAS Mfg 10:12:59 10:13:00 Das Time: **Audit Time** 4000392 Tfer Desc. Source generator (D **Serial Number** Das Day: 334 **Audit Day** 334 Tfer ID 01321 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 **Slope** Intercept 0.0001 0.0001 0.0002 0.0002 1/22/2015 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 86590148 Tfer Desc. DVM 01310 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/11/2021 1.00000 **Cert Date** CorrCoff Channel Input DVM Output DAS Output InputUnit OutputUnit Difference 7 V 0.0000 0.0000 0.0000 0.00007 0.1000 0.1165 0.1165 V V 0.00007 0.3000 0.3504 0.3502 V V -0.0002 V V 7 0.5000 0.5005 0.5005 0.0000V 0.7000 V -0.0001 7 0.7002 0.7001 V V 0.9000 0.9003 0.9002 -0.0001 7 1.0000 1.0004 1.0003 V V -0.0001

Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter 888000 Apex illegible QAK172 Eric Hebert 11/30/2021 Flow Rate Mfg BIOS Parameter Flow Rate Tfer Desc. BIOS 530-H **Serial Number** 01414 Tfer ID **Slope** 1.00185 **Intercept** 0.02453 2/10/2021 0.99999 CorrCoff **Cert Date** 0 **DAS 2: DAS 1:** Cal Factor Zero 0 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 2.74% 2.74% 1.5 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. primary pump off 0.000 0.0000.00 0.0000.02 1/m1/mleak check 0.000 0.000 0.08 0.0000.09 1/ml/mprimary 1.49 1/m 2.74% test pt 1 1.483 1.460 0.000 1.50 1/mprimary 1.460 1.49 0.000 1.50 1/m1/m2.74% primary test pt 2 1.488 1.49 0.0001/m2.74% test pt 3 1.492 1.460 1.50 1/mprimary Sensor Component Leak Test Condition Status pass **Condition** Good Status pass **Sensor Component** Tubing Condition Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry 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 Status pass **Sensor Component** Filter Azimuth Condition 360 deg Status pass Sensor Component System Memo Condition

Ozone Data Form

Mfg	Serial Numbe	er Ta Site		Te	chnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElectron Inc	1030244794	QAK17	2	Er	ic Hebert	11/30/2021	Ozone		000676
Intercept -0		rcept	0.0000 0.0000 0.0000	0	Mfg Serial Number Tfer ID	ThermoElectron 1180930075 01115			ozone c. Ozone primary stan
DAS 1: A Avg % Diff: A M 0.0%		AS 2: Avg %Diff A	Max '	% Di	Slope Cert Date	1.0056		rcept Coff	0.14070
UseDescription	ConcGroup	Tfer Raw	Tf	fer Corr	Site	Site Unit	RelPer	Dif	AbsDif
primary	1	0.81		0.65	0.38	ppb	1011 01		-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	1	108.82	112.20	ppb		3.06	
Sensor Componer	Audit Press	ure		Condition	710.1 mmHg		Status	pass	
Sensor Componer	26.6 degree	unobstructed ru	ıle	Condition	True		Status	pass	
Sensor Componer	Tree dewline	e >10m or below	v inlet	Condition	True		Status	pass	
Sensor Componer	ADT <100 v	ehicles further t	han 2	Condition	True		Status	pass	
Sensor Componer	ADT >100 v	ehicles further t	han 5	Condition	True		Status	pass	
Sensor Componer	Sample Tra	in		Condition	Good		Status	pass	
Sensor Componer	Inlet Filter C	ondition		Condition	Moderately cle	an	Status	pass	
Sensor Componer	Offset			Condition	0.000		Status	pass	
Sensor Componer	Span			Condition	n 1.029		Status	pass	
Sensor Componer	Zero Voltag	е		Condition	n N/A		Status	pass	
Sensor Componer	Fullscale Vo	ltage		Condition	n N/A		Status	pass	
Sensor Componer	Cell A Freq.			Condition	91.5 kHz		Status	pass	
Sensor Componer	Cell A Noise)		Condition	0.9 ppb		Status	pass	
Sensor Componer	Cell A Flow			Condition	0.71 lpm		Status	pass	
Sensor Componer	Cell A Press	sure		Condition	684.0 mmHg		Status	pass	
Sensor Componer	Cell A Tmp.			Condition	32.6 C		Status	pass	
Sensor Componer	Cell B Freq.			Condition	98.2 kHz		Status	pass	
Sensor Componer	Cell B Noise	;		Condition	0.8 ppb		Status	pass	
Sensor Componer	Cell B Flow				0.71 lpm		Status		
Sensor Componer	Cell B Press	sure		Condition	684.6 mmHg		Status		
Sensor Componer	System Mer	no		Condition			Status		

Temperature Data Form Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg RM Young QAK172 Eric Hebert 11/30/2021 Temperature 06308 12533 Mfg Extech Parameter Temperature Tfer Desc. RTD H232679 **Serial Number** 01228 Tfer ID **Slope** 1.00751 Intercept 0.16174 **DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 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 \mathbf{C} -0.2527.1 C Temp Mid Range 27.58 27.21 0.000 -0.16 primary 46.00 45.50 0.000 C -0.25 primary Temp High Range 45.3 Status pass Sensor Component | Shield **Condition** Clean **Condition** N/A Status pass **Sensor Component** Blower Sensor Component Properly Sited **Condition** Properly sited Status pass Sensor Component System Memo Status pass **Condition**

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:** Mfg Extech Parameter Shelter Temperature Abs Avg Err Abs Max Err **Abs Avg Err Abs Max Err** Tfer Desc. RTD H232679 **Serial Number** 0.70 0.95 01228 Tfer ID 1.00751 0.16174 **Slope** Intercept 2/18/2021 1.00000 **Cert Date** CorrCoff UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Mid Range 24.33 23.99 0.00024.5 \mathbf{C} 0.46 C Temp Mid Range 23.63 23.29 0.00024.2 0.95 primary Status pass **Sensor Component** System Memo Condition

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	QAK172	Technician	Eric Hebert	Site Visit Date	11/30/2021
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Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2625-2)	640 cuft

Sensor Component	Sample Tower Type	Condition	Туре В	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	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Fair	Status	pass
Sensor Component	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass
Sensor Component	System Memo	Condition		Status	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 Visit Date 11/30/2021 QAK172 Technician Eric Hebert Site ID Quaker City **USGS Map EPA Site Sponsor (agency)** Map Scale Private **Operating Group Map Date** 39-121-9991 AQS# R.M. Young **Meteorological Type** Ozone, IMPROVE 39.9431 Air Pollutant Analyzer **QAPP** Latitude -81.3378 dry **QAPP** Longitude **Deposition Measurement** 372 **Land Use** woodland - mixed, agriculture **QAPP Elevation Meters** 7.9 rolling Terrain **QAPP Declination** Yes 2/22/2006 Conforms to MLM **OAPP Declination Date** (740) 679-3345 39.942714 **Site Telephone Audit Latitude** 58163 St. Johns Road -81.337914 Site Address 1 **Audit Longitude** Site Address 2 **Audit Elevation** 371 -8.2 Noble **County Audit Declination** Quaker City, OH City, State **Present** Fire Extinguisher 43773 New in 2015 Zip Code Eastern **First Aid Kit** Time Zone **✓ Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **Climbing Belt** Primary Op. E-mail **Security Fence Backup Operator Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail Shelter Working Room ✓ Make Model 8810 (s/n 2625-2) Ekto **Shelter Size** 640 cuft **✓** Notes The shelter is in fair condition with some loose floor tiles. Shelter Clean **✓** Notes Site OK From I-70 take exit 193, route 513 south to Quaker City. At the 4-way stop turn right and continue approximately 0.8 **Driving Directions** 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	e 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		
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	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 so	olar radiation sensor p	lumb?		✓	N/A		
7	Is it sited to avoid shading, or any artificial or reflected light?			~	N/A			
8	Is the ra	nin 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 inc	clined approximately 3	0 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:

Fic	eld Systems Data Form		F-02058-1500-S4-rev002
Site	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?	✓	
	ide any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:		regarding conditions listed above, or any other features,

Fi	eld Systems Data Form		F-02058-1500-S5-rev002				
Site	QAK172 Technician Eric Hebert		Site Visit Date 11/30/2021				
	Siting Criteria: Are the pollutant analyzers and deposition ec	uip	ment 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	l ma	<u>intenance</u>				
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				
	rovide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, atural 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 Do the DAS instruments appear to be in good condition and well maintained? **V** Are all the components of the DAS operational? (printers, modem, backup, etc) Temperature only Do the analyzer and sensor signal leads pass through lightning protection circuitry? **✓** Are the signal connections protected from the weather and well maintained? **✓** Are the signal leads connected to the correct DAS channel? Are the DAS, sensor translators, and shelter properly **~** grounded? **✓** Does the instrument shelter have a stable power source? **✓** Is the instrument shelter temperature controlled? Grounded Stable Is the met tower stable and grounded? Is the sample tower stable and grounded? **V V** 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 System	ns Data Fo	rm			F-02	058-1500-S7-rev002		
Site ID QAK	172	Technician	Eric Hebert	Site Visit Date	11/30/2021			
Documentation								
Does the site hav	ve the required i	nstrument an	d equipment manual	s?				
	Yes		/ A	<u></u>	Yes	No N/A		
Wind speed sensor			D ata log	ger				
Wind direction sen			D ata log	ger				
Temperature senso		_	Strip ch	art recorder				
Relative humidity	sensor		Comput	er	✓			
Solar radiation sen	sor		Modem					
Surface wetness ser			Printer					
Wind sensor transl			Zero air	pump				
Temperature trans			Filter flo	ow pump				
Humidity sensor tr			Surge p	rotector				
Solar radiation tra	nslator							
Tipping bucket rai			L ightniı	ng protection device				
Ozone analyzer	✓		Shelter	heater				
Filter pack flow co	ntroller 🗸			air conditioner	✓			
Filter pack MFC p	ower supply							
Does the site ha	ave the required	and most rec	ent QC documents a	nd report forms?				
	Pro	esent			Currer	nt		
Station Log		✓			✓			
SSRF		✓			✓			
Site Ops Manual		✓ Feb 20)14					
HASP		✓ Feb 20						
Field Ops Manual								
Calibration Report	ts	✓			✓			
Ozone z/s/p Contro	l Charts							
Preventive mainter	ance 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?								
	of-custody former to and from la		ed to document					
4 Are ozone z/s/current?	p control charts	properly com	pleted and	Control charts not u	ısed			
Provide any additionatural or man-ma				y) regarding condit	tions listed a	above, or any other features,		

Field Systems Data Form F-02058-1500-S8-rev002 QAK172 Technician Eric Hebert Site Visit Date 11/30/2021 Site ID Site operation procedures Site operator refresher training July 2006 Has the site operator attended a formal CASTNET training ✓ course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **~** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** N/A **Multipoint Calibrations V V** N/A **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **Manual Rain Gauge Test V V** N/A **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily **V V** As needed Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests V** As needed **Manual Precision Level Test ✓ V** Weekly **Analyzer Diagnostics Tests ~** Every 2 weeks **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V V** Weekly Sample Line Check for Dirt/Water **~ V** Weekly **Zero Air Desiccant Check** Unknown Do multi-point calibration gases go through the complete

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

✓

✓

Logbook, call-in

sample train including all filters?

reported? If yes, how?

Do automatic and manual z/s/p gasses go through the

Are the automatic and manual z/s/p checks monitored and

complete sample train including all filters?

Field Systems Data Form F-02058-1500-S9-rev002 QAK172 Technician Eric Hebert Site Visit Date 11/30/2021 Site ID **Site operation procedures** Is the filter pack being changed every Tuesday as scheduled? Filter changed morinings 80% of the time Are the Site Status Report Forms being completed and filed correctly? No longer required Are data downloads and backups being performed as scheduled? **✓** SSRF Are general observations being made and recorded? How? **V** Are site supplies on-hand and replenished in a timely fashion? SSRF, logbook, call-in Are sample flow rates recorded? How? Are samples sent to the lab on a regular schedule in a timely fashion? **✓** Clean gloves on and off Are filters protected from contamination during handling and shipping? How? **~** Are the site conditions reported regularly to the field operations manager or staff? **QC Check Performed** Compliant **Frequency V** ✓ Semiannually **Multi-point MFC Calibrations** Weekly **V** Flow System Leak Checks **Filter Pack Inspection V ✓** Weekly **Flow Rate Setting Checks V ✓** Weekly **Visual Check of Flow Rate Rotometer** ✓ Semiannually **V In-line Filter Inspection/Replacement ✓** Weekly 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:

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	<u> </u> 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	В	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
BFT	142-Eric H	ebert-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	В	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 0.02 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Campbell 3815 BFT142 Eric Hebert 12/06/2021 DAS Primary Das Date: 12/6 /2021 **Audit Date** 12/6 /2021 Datel Parameter DAS Mfg 07:30:01 07:30:00 Das Time: **Audit Time** 4000392 Tfer Desc. Source generator (D **Serial Number** 340 Das Day: 340 **Audit Day** Tfer ID 01321 **Low Channel: High Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0001 0.0001 0.0002 0.0002 1/22/2015 1.00000 **Cert Date** CorrCoff Fluke Parameter DAS Mfg **Serial Number** 86590148 Tfer Desc. DVM 01310 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/11/2021 1.00000 **Cert Date** CorrCoff Channel Input **DVM** Output DAS Output InputUnit OutputUnit Difference 7 V 0.00000.0000 0.0000 0.0000 7 0.1000 0.1005 0.1005 V V 0.00007 0.3000 0.3013 0.3014 V V 0.0001V V 7 0.5000 0.5040 0.5039 -0.0001 V 0.7000 V -0.0001 7 0.7054 0.7053 V V 0.9000 0.90700.9068 -0.0002 7 1.0000 1.0076 V V -0.0002 1.0078

Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter Eric Hebert 000593 Apex illegible BFT142 12/06/2021 Flow Rate Mfg BIOS Parameter Flow Rate Tfer Desc. BIOS 530-H **Serial Number** 01414 Tfer ID **Slope** 1.00185 **Intercept** 0.02453 2/10/2021 0.99999 CorrCoff **Cert Date** -0.01 **DAS 2: DAS 1:** Cal Factor Zero 1 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 1.81% 2.04% 1.5 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. primary pump off 0.000 0.0000.000.000-0.01 1/m1/mleak check 0.000 0.000 0.04 0.0000.01 1/ml/mprimary 1.50 0.000 1/m 2.04% test pt 1 1.501 1.470 1.50 1/mprimary 1.470 1.50 0.000 1.50 1/m1/m2.04% primary test pt 2 1.501 0.0001/m1.35% primary test pt 3 1.505 1.480 1.50 1.50 1/mSensor Component Leak Test Condition Status pass **Condition** Good Status pass **Sensor Component** Tubing Condition Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry Sensor Component Moisture Present **Condition** No moisture present Status pass Sensor Component Filter Distance Condition 4.0 cm Status pass Sensor Component Filter Depth Status pass Condition 1.5 cm Status pass **Sensor Component** Filter Azimuth Condition 180 deg Status pass Sensor Component System Memo Condition

Ozone Data Form

Mfg	Serial Numbe	er Ta Site		Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347315	BFT14	2	Eric Hebert	12/06/2021	Ozone	000746
Slope: 0.99407 Slope: 0.000000		0.00000	Mfg	ThermoElectron	Inc Param	eter ozone	
1			0.00000	Serial Number	1180930075	Tfer D	esc. Ozone primary stan
CorrCoff 0.	99999 Cori	rCoff	0.00000	Tfer ID	01115		
DAS 1:	DA	AS 2:		Slope	1.0056	0 Intercept	0.14070
A Avg % Diff: A Ma	ax % Di A	Avg %Diff A	A Max % Di	•	4/7/202		
0.0%	0.0%			Cert Date	4/1/202	CorrCoff	0.99990
UseDescription	ConcGroup	Tfer Raw	Tfer Cor	r 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	-1.8	
primary	4	70.03	68.59	67.62	ppb	-1.4	
primary	5	112.74	110.51	109.70	ppb	-0.7	4
Sensor Component	Audit Pressu	ıre	Cond	760.9 mmHg		Status pass	3
Sensor Component	26.6 degree	unobstructed r	ule Cond	lition True		Status pass	3
Sensor Component	Tree dewline	e >10m or belov	w inlet Cond	lition True		Status pass	3
Sensor Component	ADT <100 v	ehicles further t	than 2 Cond	lition True		Status pass	3
Sensor Component	ADT >100 v	ehicles further t	than 5 Cond	lition True		Status pass	3
Sensor Component	Sample Trai	n	Cond	lition Good		Status pass	3
Sensor Component	Inlet Filter C	ondition	Cond	lition Moderately cle	ean	Status pass	5
Sensor Component	Offset		Cond	lition 0.30		Status pass	S
Sensor Component	Span		Cond	lition 1.023		Status pass	5
Sensor Component	Zero Voltage	Э	Cond	lition N/A		Status pass	8
Sensor Component	Fullscale Vo	ltage	Cond	lition N/A		Status pass	3
Sensor Component	Cell A Freq.		Cond	lition 95.9 kHz		Status pass	8
Sensor Component	Cell A Noise	;	Cond	lition Not tested		Status pass	S
Sensor Component	Cell A Flow		Cond	lition 0.60 lpm		Status pass	S
Sensor Component	Cell A Press	sure	Cond	lition 708.1 mmHg		Status pass	S
Sensor Component	Cell A Tmp.		Cond	lition 32.5 C		Status pass	S
Sensor Component	Cell B Freq.		Cond	lition 110.2 kHz		Status pass	S
Sensor Component	Cell B Noise	,	Cond	lition Not tested		Status pass	S
Sensor Component	Cell B Flow		Cond	lition 0.60 lpm		Status pass	S
Sensor Component	Cell B Press	sure	Cond	lition 708.7 mmHg		Status pass	S
Sensor Component	System Mer	no	Cond	lition		Status pass	3

Temperature Data Form Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg RM Young 4542 BFT142 Eric Hebert 12/06/2021 Temperature 04444 Mfg Extech Parameter Temperature Tfer Desc. RTD H232679 **Serial Number** 01228 Tfer ID **Slope** 1.00751 Intercept 0.16174 **DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err **Cert Date** CorrCoff 0.09 0.13 UseDesc. InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference Test type primary Temp Low Range 0.410.25 0.0000.3 \mathbf{C} 0.07 C Temp Mid Range 23.46 23.12 0.000 23.0 -0.13 primary 46.84 46.33 0.000 C -0.07 primary Temp High Range 46.3 Condition Moderately clean Status pass Sensor Component Shield **Condition** N/A Status pass **Sensor Component** Blower Sensor Component Properly Sited **Condition** Properly sited Status pass Sensor Component System Memo Status pass **Condition**

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:** Mfg Extech Parameter Shelter Temperature Abs Avg Err Abs Max Err **Abs Avg Err Abs Max Err** Tfer Desc. RTD H232679 **Serial Number** 1.12 1.13 01228 Tfer ID 1.00751 0.16174 **Slope** Intercept 2/18/2021 1.00000 **Cert Date** CorrCoff UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Mid Range 24.12 23.78 0.00024.9 \mathbf{C} 1.12 23.99 C Temp Mid Range 23.65 0.00024.8 1.13 primary **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 BFT142 Technician Eric Hebert Site Visit Date 12/06/2021	1
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Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component	Sample Tower Type	Condition	Туре В	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	Poor	Status	Fail
Sensor Component	Shelter Door	Condition	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Poor	Status	Fail
Sensor Component	Shelter walls	Condition	Poor	Status	Fail
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: 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 Visit Date 12/06/2021 BFT142 Technician Eric Hebert Site ID Williston **USGS Map EPA Site Sponsor (agency)** Map Scale **UNC-IMS Operating Group Map Date** 37-031-9991 AQS# R.M. Young **Meteorological Type** Air Pollutant Analyzer Ozone **QAPP** Latitude dry, wet **QAPP** Longitude **Deposition Measurement** Land Use agriculture **QAPP Elevation Meters** flat Terrain **QAPP Declination** Yes Conforms to MLM **OAPP Declination Date** 34.884668 **Site Telephone Audit Latitude** Open Grounds Farm -76.620666 Site Address 1 **Audit Longitude** 100 Nelson Bay Rd. Site Address 2 **Audit Elevation** 5.3 Carteret -9.9 **County Audit Declination** Beaufort, NC City, State **Present** Fire Extinguisher 28516 New in 2015 Zip Code Eastern First Aid Kit Time Zone **✓ Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **Climbing Belt** Primary Op. E-mail **Backup Operator Security Fence Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail **Shelter Working Room** ✓ **Make** Model 8810 Ekto **Shelter Size** 640 cuft **✓** Notes The shelter lights are not functioning properly. The shelter is in poor condition due to being flooded Shelter Clean during hurricanes. **✓** Notes Site OK From I-95 take highway 70 east through Morehead City and over the bridge. Continue through Beaufort staying on **Driving Directions** 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.

Fic	eld Systems Data Form	F-02058-1500-S3-rev002	
Site	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	✓	N/A
3	tower into the prevailing wind) 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:

Fi	eld Systems Data Form		F-02058-1500-S4-rev002
Site	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?	✓	
	ide any additional explanation (photograph or sketch if neces ral or man-made, that may affect the monitoring parameters:) regarding conditions listed above, or any other features,
The	neteorological tower has been removed and the temperature sens	or is	installed in a naturally aspirated shield on the sample tower.

Fi	eld Systems Data Form	F-02058-1500-S5-rev002					
Site	BFT142 Technician Eric Hebert		Site Visit Date 12/06/2021				
	Siting Criteria: Are the pollutant analyzers and deposition ed	uip	nent 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	l ma	intenance				
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				
	rovide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, atural or man-made, that may affect the monitoring parameters:						

Field Systems Data Form F-02058-1500-S6-rev002 BFT142 Technician Eric Hebert Site Visit Date 12/06/2021 Site ID DAS, sensor translators, and peripheral equipment operations and maintenance Do the DAS instruments appear to be in good condition and well maintained? **✓** Are all the components of the DAS operational? (printers, modem, backup, etc) Temperature only Do the analyzer and sensor signal leads pass through lightning protection circuitry? **✓** Are the signal connections protected from the weather and well maintained? **✓** Are the signal leads connected to the correct DAS channel? Are the DAS, sensor translators, and shelter properly **~** grounded? **✓** Does the instrument shelter have a stable power source? ~ Is the instrument shelter temperature controlled? Grounded **Stable** Is the met tower stable and grounded? Is the sample tower stable and grounded? **V** Met tower removed. 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 new sample tower is not attached to the shelter. The sample tower is not grounded.

Field Sy	ield Systems Data Form							F-02058-1500-S7-rev002			
Site ID	BFT142		Technician	Eric Hebert		Site Visit Date	12/06/2021				
Document	ation										
	ite have the require	d ins	trument and	equinment	manuals?						
Does the si	_	Yes	No N/		manuais.		Yes	No	N/A		
Wind speed s					Data logge	r	V				
Wind direction	on sensor]]	Data logge	r			✓		
Temperature	esensor	✓]	Strip chart	recorder			✓		
Relative hum	idity sensor]	Computer		✓				
Solar radiation	on sensor] 1	Modem			✓			
Surface wetn	ess sensor]	Printer				✓		
Wind sensor	translator				Zero air pu	ımp		✓			
Temperature	translator]	Filter flow	pump	\checkmark				
Humidity sen	sor translator]	Surge prot	ector			✓		
Solar radiation	on translator] 1	UPS				✓		
Tipping buck	et rain gauge]	Lightning _I	protection device			✓		
Ozone analyz	ær	✓]	Shelter hea	ter		✓			
Filter pack fl	ow controller	✓]	Shelter air	conditioner		✓			
Filter pack M	IFC power supply										
Does the	site have the requir	ed a	nd most rece	nt OC docu	ments and	report forms?					
	_	Pres		-			Curre	nt			
Station Log			/				✓				
SSRF		•	/				✓				
Site Ops Mar	nual	•	2019				✓				
HASP		•	2019				✓				
Field Ops Ma	nual		2019				✓				
Calibration F	Reports	•	/								
Ozone z/s/p (Control Charts										
Preventive m	aintenance schedul	e [
1 Is the sta	ation log properly c	omp	leted during	every site vi	sit? 🗸						
2 Are the current?	Site Status Report l	Form	as being com	pleted and	✓						
	chain-of-custody fo ransfer to and fron			d to docume	ent 🗸						
4 Are ozoi current?	ne z/s/p control char	rts p	roperly comp	oleted and	C	ontrol charts not us	sed				
	additional explanati an-made, that may					regarding conditi	ions listed a	bove, o	or any other features,		

Field Systems Data Form F-02058-1500-S8-rev002 BFT142 Technician Eric Hebert Site Visit Date |12/06/2021 Site ID Site operation procedures Has the site operator attended a formal CASTNET training ✓ course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **~** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** N/A **Multipoint Calibrations V V** N/A **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **Manual Rain Gauge Test V V** N/A **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V V** Semiannually **V Automatic Zero/Span Tests** Daily **V** As needed Manual Zero/Span Tests **V** Daily **Automatic Precision Level Tests V** As needed **Manual Precision Level Test ✓ V** Weekly **Analyzer Diagnostics Tests ~** Every 2 weeks **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V V** Weekly Sample Line Check for Dirt/Water **V ~** As needed **Zero Air Desiccant Check** Unknown Do multi-point calibration gases go through the complete sample train including all filters? **✓** Do automatic and manual z/s/p gasses go through the complete sample train including all filters? **✓** SSRF, call-in 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:

Field Systems Data Form			F-02058-1500-S9-rev002			
Site ID BFT142 Tec	hnician Eric Hebert		Site Visit Date 12/06/2021			
Site operation procedures						
1 Is the filter pack being changed ever	y Tuesday as scheduled?	V	Filter changed morinings			
2 Are the Site Status Report Forms be correctly?	ing completed and filed	✓				
3 Are data downloads and backups be scheduled?	ing performed as		No longer required			
4 Are general observations being made	e and recorded? How?	✓ (SSRF			
5 Are site supplies on-hand and replen fashion?	ished in a timely	✓				
6 Are sample flow rates recorded? Ho	w?	✓	SSRF, logbook, call-in			
7 Are samples sent to the lab on a regulation?	ılar schedule in a timely	✓				
8 Are filters protected from contamina and shipping? How?	ntion during handling	✓ (Clean gloves on and off			
9 Are the site conditions reported regularized operations manager or staff?	llarly to the field	✓				
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 (photo	~ ·	• .	regarding conditions listed above, or any other features,			

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	В	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

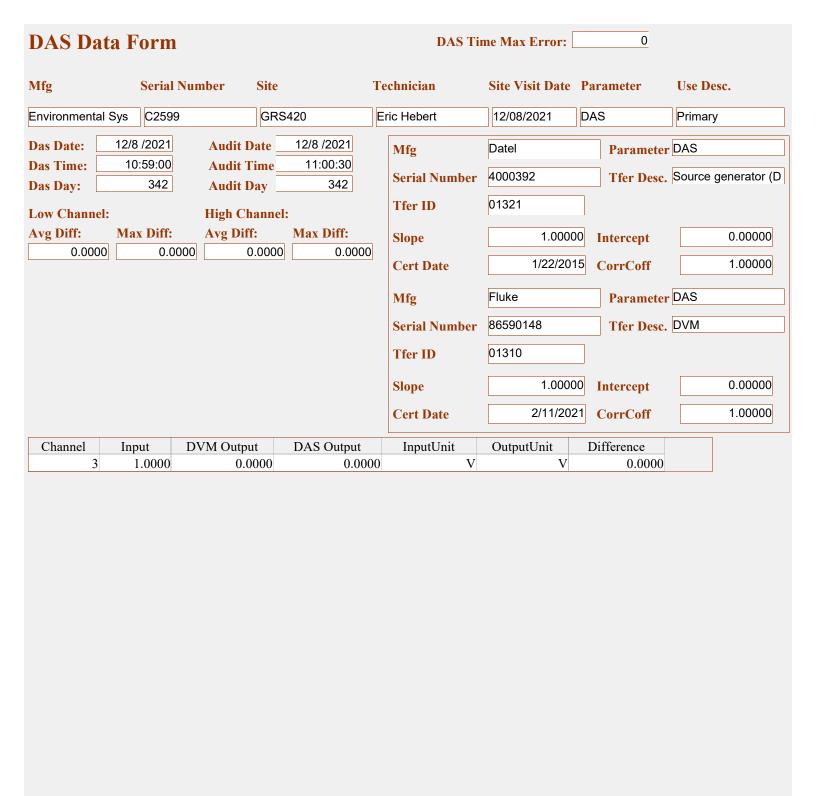
Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PNF	126-Eric H	Tebert-12/07/2021				
1	12/7/2021	DAS	Campbell	illegible	CR3000	3817
2	12/7/2021	Ozone	ThermoElectron Inc	000741	49i A1NAA	1105347316
3	12/7/2021	Ozone Standard	ThermoElectron Inc	000363	49i A3NAA	0726124691
4	12/7/2021	Zero air pump	Werther International	06885	C 70/4	000814270

Ozone Data Form

Mfg	\$	Serial Numb	er Ta Site		Teo	chnician	Site Visit Date	Paramo	eter	Owner l	ID
ThermoElectr	ron Inc	1105347316	PNF	126	Eri	c Hebert	12/07/2021	Ozone		000741	
Slope:		02367 Slo r		0.00000		Mfg	ThermoElectron	Inc Pa	rametei	ozone	
Intercept _			rcept	0.00000		Serial Number	1180930075	Tf	er Desc.	Ozone primar	y stan
CorrCoff	0.	99998 Cor	rCoff	0.00000		Tfer ID	01115				
DAS 1:		D	AS 2:			Slope	1.0056	0 Inte	rcept	0.14	4070
A Avg % Di			Avg %Diff	A Max %	Di Di	Cert Date	4/7/202	_ 11 Com	rCoff	0.99	9990
0.0%	%	0.0%				Cert Date	177202	Con	Con	0.00	
UseDescrip	otion	ConcGroup	Tfer Raw	Tfe	r Corr	Site	Site Unit	RelPer	Dif	AbsDif	
primary	7	1	0.06		0.07	0.46	ppb			0.53	
primary		2	17.36		5.90	17.91	ppb			1.01	
primary		3	37.29		5.46	37.38	ppb		2.49		
primary		4	71.73		0.26	71.89	ppb		2.29		
primary		5	117.31		5.00	118.40	ppb		2.91		
	_	Audit Press				641 mmHg		Status	pass		
Sensor Cor	mponen	26.6 degree	unobstructe	d rule (Conditio	True		Status	pass		
Sensor Con	mponen	Tree dewlin	e >10m or be	elow inlet (Conditio	True		Status	pass		
Sensor Con	mponen	ADT <100 v	ehicles furth	er than 2	Conditio	True		Status	pass		
Sensor Cor	mponen	ADT >100 v	ehicles furth	er than 5	Conditio	True		Status	pass		
Sensor Con	mponen	Sample Tra	in	(Conditio	Good		Status	pass		
Sensor Cor	mponen	Inlet Filter C	Condition	(Conditio	Clean		Status	pass		
Sensor Cor	mponen	Offset		Condition -0.40		Status pass		pass			
Sensor Cor	mponen	Span		(Conditio	1.003		Status	pass		
Sensor Cor	mponen	Zero Voltag	е	(Conditio	n N/A		Status	pass		
Sensor Con	mponen	Fullscale Vo	oltage	(Conditio	ion N/A		Status	pass		
Sensor Con	mponen	Cell A Freq		(Conditio	82.9 kHz		Status	pass		
Sensor Con	mponen	Cell A Noise	9	(Conditio	Not tested		Status	pass		
Sensor Con	mponen	Cell A Flow		(Conditio	0.64 lpm		Status	pass		
Sensor Con	mponen	Cell A Pres	sure	(Conditio	623.8 mmHg		Status	pass		
Sensor Con	Sensor Component Cell A Tmp.				27.2 C		Status				
Sensor Con	mponen	Cell B Freq.		(Conditio	103.7 kHz		Status	pass		
Sensor Con	mponen	Cell B Noise	9		Conditio	Not tested		Status	pass		
Sensor Con	mponen	cell B Flow		(Conditio	0.70 lpm		Status	pass		
Sensor Component Cell B Pressure		sure		Conditio	624.7 mmHg		Status	pass			
Sensor Component System Memo		System Me	mo	(Conditio	on		Status	pass		

Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GRS	420-Eric H	lebert-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	В	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



Flow Data Form Mfg Serial Number Tag Site Technician Site Visit Date Parameter Mykrolis AW9510056 GRS420 Eric Hebert 12/08/2021 Flow Rate

Owner ID

0.02453

0.99999

none

2/10/2021 **CorrCoff**

IVIY	Krolis	AVV9510056	GR5420	Eric Hebert	12/08/2021	riow Rate	none
					Ţ		
M	fg	Mykrolis		Mfg	BIOS	Parameter Flo	w Rate
	<u> </u>			0 1131		T. D. D.	20 500 11
SN	V/Owner ID	FP9510004 none		Serial Number		Tfer Desc. BIC	JS 530-H
Pa	rameter:	MFC power supply		Tfer ID	01414		
		1				_	
				Slope	1.00185	Intercept	0.0

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

2.1370	2.1370				Kotometer K	eading:	<u>J</u>	.00		
Desc.	Test type	Input l/m	Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	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	1/m	l/m		
primary	test pt 1	2.962	2.930	2.96	0.0000	3.01	1/m	l/m	2.73%	
primary	test pt 2	2.964	2.930	2.96	0.0000	3.01	1/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			Statu	pass			
Sensor Component Tubing Condition				Condition	Condition Good			Status pass		
Sensor Component Filter Position				Condition	Good		Statu	pass		

Cert Date

-			1		
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 Numbe	er Ta Site		Te	chnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElectron Inc	1023943903	GRS42	0	Er	ic Hebert	12/08/2021	Ozone		none
Intercept		rcept	0.0000	0	Mfg Serial Number Tfer ID	ThermoElectron 1180930075 01115			ozone c. Ozone primary stan
DAS 1: A Avg % Diff: A M 0.0%		AS 2: Avg %Diff A	Max	% Di	Slope Cert Date	1.0056		rcept Coff	0.14070
UseDescription	ConcGroup	Tfer Raw	Tf	fer Corr	Site	Site Unit	RelPer	Dif	AbsDif
primary	1	0.18	11	0.03	0.43	ppb	Kell el	DII	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	1	05.67	106.45	ppb		0.74	
Sensor Componer	Audit Press	ure		Condition	710 mmHg		Status	pass	
Sensor Componer	26.6 degree	unobstructed ru	ıle	Condition	True		Status	pass	
Sensor Componer	Tree dewline	e >10m or below	/ inlet	Condition	True		Status	pass	
Sensor Componer	ADT <100 v	ehicles further the	nan 2	Condition	True		Status	pass	
Sensor Componer	ADT >100 v	ehicles further the	nan 5	Condition	225 m		Status	Fail	
Sensor Componer	Sample Tra	in		Conditio	Good		Status	pass	
Sensor Componer	Inlet Filter C	Condition		Conditio	On Clean		Status	pass	
Sensor Componer	Offset			Condition	lition 0.000		Status	pass	
Sensor Componer	Span			Condition 1.001			Status	pass	
Sensor Componer	Zero Voltag	е		Condition	on N/A		Status	pass	
Sensor Componer	Fullscale Vo	ltage		Condition	on N/A		Status	pass	
Sensor Componer	Cell A Freq.			Condition	90.1 kHz		Status	pass	
Sensor Componer	Cell A Noise)		Condition	Not tested		Status	pass	
Sensor Componer	Cell A Flow			Condition	0.63 lpm		Status	pass	
Sensor Componer	Cell A Press	sure		Condition	680.4 mmHg		Status	pass	
Sensor Componer	Cell A Tmp.			Condition	30.9 C		Status	pass	
Sensor Componer	Cell B Freq.			Condition	on 101.2 kHz		Status	pass	
Sensor Componer	Cell B Noise	;		Condition	Not tested		Status	pass	
Sensor Componer	Cell B Flow			Condition	0.56 lpm		Status		
Sensor Component Cell B Pressure		Condition	679.5 mmHg	Status					
Sensor Componer	System Mer	no		Condition			Status		
						<u> </u>			

2 Meter Temperature Data Form Calc. Difference Serial Number Tag Site **Technician** Site Visit Date Parameter Mfg **Owner ID** GRS420 Temperature2meter RM Young 032955 Eric Hebert 12/08/2021 none Mfg Extech Parameter Temperature H232679 Tfer Desc. RTD **Serial Number** 01228 Tfer ID **Slope** 1.00751 **Intercept** 0.16174 **DAS 1: DAS 2:** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err CorrCoff **Cert Date** 0.19 0.33 UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Difference Test type primary Temp Low Rang 0.81 0.64 0.0000 $0.97 \, \rm C$ 0.33 22.52 22.19 0.0000 22.34C 0.15 primary Temp Mid Range Temp High Rang primary 49.03 48.50 0.0000 48.60 C 0.1 Sensor Component | Shield **Condition** Clean Status pass **Condition** Properly sited Sensor Component Properly Sited Status pass Sensor Component Blower **Condition** Functioning Status pass Sensor Component System Memo Status pass **Condition**

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:** Mfg Extech Parameter Shelter Temperature Abs Avg Err Abs Max Err **Abs Avg Err Abs Max Err** Tfer Desc. RTD H232679 **Serial Number** 0.75 0.81 01228 Tfer ID 1.00751 0.16174 **Slope** Intercept 2/18/2021 1.00000 **Cert Date** CorrCoff OSE Unit Difference UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng primary Temp Mid Range 19.80 19.49 0.00020.3 \mathbf{C} 0.81 C Temp Mid Range 19.92 19.61 0.00020.3 0.69 primary **Sensor Component** System Memo Condition Status pass

Siting Criteria Form

Sensor Component City > 50,000 Condition 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 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	Limited agriculture operations	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 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	City > 50,000	Condition 35 km	Status	Fail
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	Sensor Component	City 1,000 to 10,000	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	Sensor Component	City 10,000 to 50,000	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	Sensor Component	Feedlot operations	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	Sensor Component	Intensive agriculture operations	Condition	Status	pass
Sensor Component Major industrial source Condition Status pass Sensor Component Secondary road < or = 100 per da Condition Status pass Sensor Component Secondary road >100 vehicles/da Condition Status pass Sensor Component Small parking lot Condition Status pass	Sensor Component	Large point source of So2 or Nox	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	Major highway, airport, or rail yard	Condition	Status	pass
Sensor Component Secondary road >100 vehicles/da Condition Status pass Sensor Component Small parking lot Condition Status pass	Sensor Component	Major industrial source	Condition	Status	pass
Sensor Component Small parking lot 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 System Memo 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	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	Sample Tower Type	Condition	Туре В	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 Proble									
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 Visit Date 12/08/2021 GRS420 Technician Eric Hebert Site ID Blockhouse **USGS Map** NPS **Site Sponsor (agency)** Map Scale NPS **Operating Group Map Date** 47-009-0101 AQS# R.M. Young **Meteorological Type** 35.6331 Air Pollutant Analyzer Ozone, Hg, SO2, NOx, PM2.5, PM10, **QAPP** Latitude **QAPP** Longitude -83.9422 **Deposition Measurement** woodland - mixed 793 **Land Use QAPP Elevation Meters** complex (ridge-top) Terrain **QAPP Declination** No Conforms to MLM **OAPP Declination Date** 35.633482 **Site Telephone Audit Latitude** -83.941606 Look Rock Site Address 1 **Audit Longitude** Site Address 2 Foothills Parkway **Audit Elevation** 801 Blount 5.5 **County Audit Declination** Maryville, TN City, State **Present** Fire Extinguisher 37803 inspected Sept 2019 Zip Code Eastern Time Zone **First Aid Kit ✓ Primary Operator Safety Glasses** Safety Hard Hat Primary Op. Phone # **V Climbing Belt** Primary Op. E-mail **V Security Fence Backup Operator V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail **Shelter Working Room** ✓ **Make** Model 8810 (s/n 2961-1) Ekto **Shelter Size** 640 cuft **✓** Notes **Shelter Clean** The shelter is in good condition, clean, neat, and well organized. **✓** Notes Site OK 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.

Driving Directions

Fi	eld 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?	V	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
Dw	vide any additional evaluation (photograph or sketch if necessity	000	y) regarding conditions listed above on 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.

Fi	eld Systems Data Form	F-02058-1500-S4-rev002
Site	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?	
	ide any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	regarding conditions listed above, or any other features,:

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	GRS420 Technician Eric Hebert		Site Visit Date 12/08/2021
	Siting Criteria: Are the pollutant analyzers and deposition eq	uipı	nent 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	l ma	intenance
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?	✓	
Prov natu	vide any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	ary)	regarding conditions listed above, or any other features,

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 Do the DAS instruments appear to be in good condition and well maintained? **✓** Are all the components of the DAS operational? (printers, modem, backup, etc) Met sensors only Do the analyzer and sensor signal leads pass through lightning protection circuitry? **✓** Are the signal connections protected from the weather and well maintained? **✓** Are the signal leads connected to the correct DAS channel? Are the DAS, sensor translators, and shelter properly **~** grounded? **✓** Does the instrument shelter have a stable power source? **~** Is the instrument shelter temperature controlled? Grounded **Stable** Is the met tower stable and grounded? **V V** Is the sample tower stable and grounded? **V V** Sample tower grounded to shelter, and slightly bent at hinge. 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 GRS420 Technician Eric Hebert Site Visit Date 12/08/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? Yes No N/A Yes No N/A ✓ **V** Wind speed sensor Data logger **V** ✓ П Wind direction sensor Data logger **V** ✓ П **Temperature sensor** Strip chart recorder **V** П **V** Relative humidity sensor Computer **V V** Solar radiation sensor Modem **V ~ Printer** Surface wetness sensor **V V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump **V ~ Humidity sensor translator Surge protector ✓** П \checkmark П **UPS Solar radiation translator** П **✓ V** Tipping bucket rain gauge **Lightning protection device** ~ **V** Shelter heater Ozone analyzer **V ✓** 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 ✓ V** Dataview **SSRF V ✓ V V** Site Ops Manual **V V HASP V** Field Ops Manual **V 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 Flow & observation sections Are the Site Status Report Forms being completed and current? Are the chain-of-custody forms properly used to document **✓** sample transfer to and from lab? Control charts not used Are ozone z/s/p control charts properly completed and current? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

Field Systems Data Form F-02058-1500-S8-rev002 GRS420 Technician Eric Hebert Site Visit Date 12/08/2021 Site ID Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday **V** schedule? **✓** Are the standard CASTNET operational procedures being flollowed by the site operator? 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 **✓ V** Semiannually **Multipoint Calibrations V V** Weekly **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** Monthly **Manual Rain Gauge Test ✓ V** Weekly **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? Compliant **OC Check Performed** Frequency **Multi-point Calibrations V V** Semiannually **V V Automatic Zero/Span Tests** Daily **V V** Weekly Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests V Manual Precision Level Test V V** Alarm values only **Analyzer Diagnostics Tests V ✓** Weekly **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V V** Sample Line Check for Dirt/Water Weekly **V ~** As needed **Zero Air Desiccant Check ✓** Do multi-point calibration gases go through the complete sample train including all filters? **✓** Do automatic and manual z/s/p gasses go through the complete sample train including all filters? **✓** Dataview 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 is leak-tested each week after the inlet filter is changed.

Fic	eld Sy	stems Data Form				F-02058-1500-S9-rev002			
Site	e ID	GRS420 Te	chnician Eric Hebert		Site Visit Date	12/08/2021			
	Site ope	ration procedures							
1	Is the fil	ter pack being changed ever	ry Tuesday as scheduled	? ✓	Filter changed mori summer	nings in winter, changed in afternoon in			
2	Are the correctl	Site Status Report Forms b	eing completed and filed						
3					No longer required				
4	Are gen	eral observations being mad	le and recorded? How?	✓	SSRF				
5	5 Are site supplies on-hand and replenished in a timely fashion?			✓					
6	Are sam	ple flow rates recorded? Ho	ow?	✓	SSRF				
7	Are sam	pples sent to the lab on a reg	ular schedule in a timely	✓					
8		ers protected from contamin oping? How?	ation during handling	✓	Clean gloves on an	d off			
9		site conditions reported reg ons manager or staff?	ularly to the field						
QC	Check Po	erformed	Frequency			Compliant			
N	Aulti-poii	nt MFC Calibrations	✓ Semiannually			✓			
F	low Syste	em Leak Checks	✓ Weekly			✓			
F	ilter Pac	k Inspection	✓ Weekly			✓			
F	low Rate	Setting Checks	✓ Weekly			✓			
V	isual Ch	eck of Flow Rate Rotometer	✓ Weekly		✓				
I	n-line Fil	ter Inspection/Replacement	✓ As needed			\checkmark			
S	ample Li	ne Check for Dirt/Water	✓ Weekly			\checkmark			
		dditional explanation (phot an-made, that may affect the			y) regarding conditi	ons listed above, or any other features,			

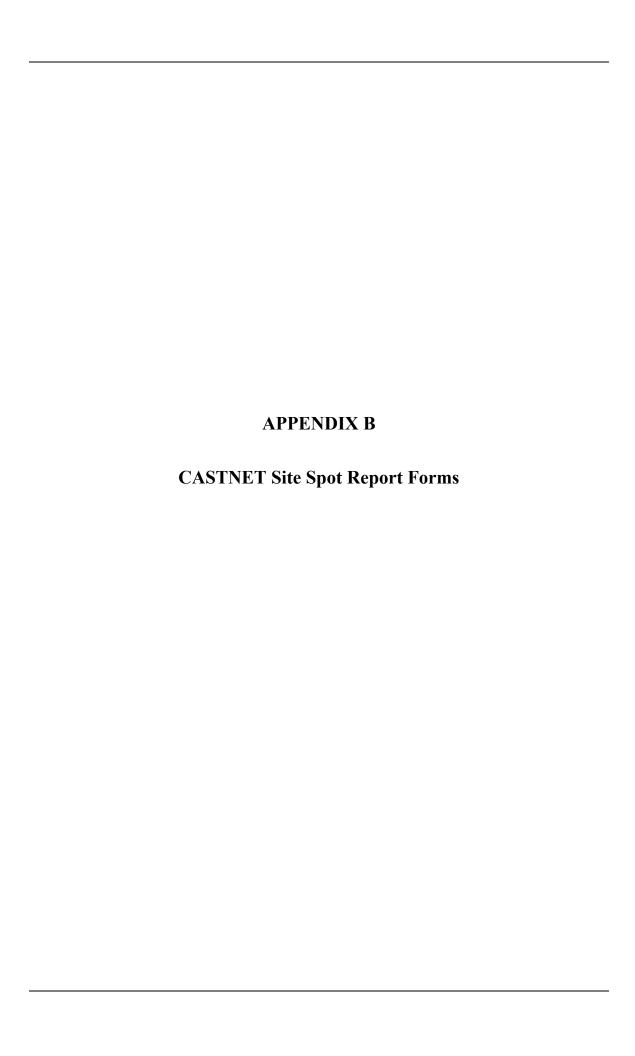
Field Systems Data Form

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	В	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



Data Compiled: 3/8/2022 07:45:40

SiteVisitDate Site Technician

10/24/2021 ABT147 Korey Devins

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

Data Compiled:

3/4/2022 12:53:34

SiteVisitDate Site Technician

10/21/2021 ALH157 Korey Devins

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 Technic

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.

Data Compiled:

3/4/2022 15:55:13

SiteVisitDate Site Technician

12/06/2021 BFT142 Eric Hebert

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.

Data Compiled:

3/3/2022 13:33:55

SiteVisitDate Site Technician

10/13/2021 BVL130 Korey Devins

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

SiteVisitDa	ate Site	Technician						
10/13/2021	BVL130	Korey Devins						
34 DAS	Voltage average error	P	7	0.003	56	0.0000	V	P
35 Surfa	ace Wetness Sensitivity test on	P	12	10000	1	170	k ohms	P
36 Surfa	ace Wetness Sensitivity test off	P	12	10000	1	190	k ohms	P
37 Surfa	ace Wetness Response	P	12	0.5	1	1.00		P
38 Shelt	ter Temperature average error	P	5	2	21	0.32	c	P
39 Shelt	ter Temperature max error	P	5	2	21	0.59	c	P

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.

Data Compiled:

3/8/2022 07:48:30

 SiteVisitDate
 Site
 Technician

 10/05/2021
 CAV436
 Martin Valvur

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	daa	P

Data Compiled:

3/4/2022 14:57:04

SiteVisitDate Site Technician

11/11/2021 CDR119 Korey Devins

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

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.

Data Compiled:

3/8/2022 07:50:30

 SiteVisitDate
 Site
 Technician

 10/01/2021
 CHA467
 Martin Valvur

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	daa	P

Data Compiled:

3/8/2022 07:52:19

 SiteVisitDate
 Site
 Technician

 10/12/2021
 DEN417
 Martin Valvur

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

Data Compiled:

3/8/2022 07:54:31

SiteVisitDate Site Technician

10/16/2021 ESP127 Eric Hebert

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

Data Compiled:

3/4/2022 16:13:45

SiteVisitDate Site Technician

12/08/2021 GRS420 Eric Hebert

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.

Data Compiled:

3/4/2022 13:52:36

SiteVisitDate Site Technician

11/04/2021 LAV410 Martin Valvur

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

11/04/2021

LAV410

Technician

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.

Data Compiled:

3/4/2022 13:16:43

SiteVisitDate Site Technician

10/22/2021 MCK131 Korey Devins

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 To	Technician
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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.

Data Compiled:

3/4/2022 13:32:32

SiteVisitDate Site Technician

10/22/2021 MCK231 Korey Devins

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
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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.

Data Compiled:

3/8/2022 07:56:15

SiteVisitDate Site Technician

11/29/2021 MKG113 Eric Hebert

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

Data Compiled:

3/4/2022 10:45:22

SiteVisitDate Site Technician

10/19/2021 OXF122 Korey Devins

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.

Data Compiled:

3/4/2022 10:05:14

SiteVisitDate Site Technician

10/06/2021 PAL190 Martin Valvur

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

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.

Data Compiled:

3/4/2022 15:14:32

SiteVisitDate Site Technician

11/12/2021 PAR107 Korey Devins

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

echnician

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.

Data Compiled:

3/4/2022 14:35:54

SiteVisitDate Site Technician

11/10/2021 PED108 Korey Devins

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.

Data Compiled:

3/8/2022 07:58:36

SiteVisitDate Site Technician

12/07/2021 PNF126 Eric Hebert

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	daa	P

Data Compiled:

3/4/2022 15:35:43

SiteVisitDate Site Technician

11/30/2021 QAK172 Eric Hebert

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.

Data Compiled:

3/4/2022 11:57:49

SiteVisitDate Site Technician

10/20/2021 SAN189 Martin Valvur

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.

Data Compiled:

3/8/2022 08:00:16

SiteVisitDate Site Technician

10/15/2021 SPD111 Eric Hebert

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	daa	P

Data Compiled:

3/4/2022 10:27:11

SiteVisitDate Site Technician

10/16/2021 STK138 Korey Devins

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.

Data Compiled:

3/4/2022 11:25:33

 SiteVisitDate
 Site
 Technician

 10/19/2021
 THR422
 Martin Valvur

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

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.