# 2021 – 2nd 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

MD DNR Maryland Department of Natural Resources

MLM Multilayer Model

MN PCA Minnesota Pollution Control Agency

m/s meters per second

mv millivolt

NIST National Institute of Standards and Technology
NOAA National Oceanic and Atmospheric Administration

NPS National Park Service

NYDEC New York Department of Conservation

NYSERDA New York State Energy Research and Development Authority

PE Performance Evaluation

QAPP Quality Assurance Project Plan

SCDHEC South Carolina Department of Health and Environmental Control

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

File location 1 EEMS/transfer/clients/EPA

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

# 1.2 Project Objectives

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

Performance audits verify that all reported variables are consistent with the accuracy goals as defined in the CASTNET Quality Assurance Project Plan (QAPP). The parameter specific accuracy goals are presented in Table 1.

Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Precipitation	Response	10 manual tips	1 DAS count per tip
Precipitation	Accuracy	2 introductions of known amounts of water	$\leq \pm 10.0\%$ 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	Temperature Accuracy Comparison to 3 NIST measured baths $(\sim 0^{\circ} \text{ C, ambient, } \sim \text{full-scale})$		≤± 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	rod/crossarm or sighted to		≤±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	≤ ± 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	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.

- 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 Second Quarter 2021

This report consists of the systems and performance, and other audit results from the CASTNET sites visited during the second quarter (April through June) 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	FSA	O3 PE	NOy	FLOW
WNC429	NPS	4/5/2021	1			1
NEC602	BLM-WSO	4/6/2021	1	1		1
BUF603	BLM-WSO	4/8/2021	1			1
SHE604	BLM-WSO	4/8/2021	1			1
CAD150	EPA	4/15/2021	1	1		1
GAS153	EPA	4/15/2021		1		
COW137	EPA	4/16/2021		1		
CHC432	NPS	4/20/2021	1	1		
CHE185	EPA	4/21/2021	1	1		1
MEV405	NPS	4/21/2021	1	1		1
CAN407	NPS	4/22/2021		1		
DIN431	NPS	4/23/2021		1		
CVL151	EPA	5/1/2021	1	1		1
PND165	BLM-WSO	5/3/2021	1	1	1	1
GRT434	NPS	5/5/2021		1		

Site ID	Sponsor	Date	FSA	O3 PE	NOy	FLOW
YEL408	NPS	5/6/2021	1	1		1
BAS601	BLM-WSO	5/7/2021		1		
CTH110	EPA	5/10/2021		1		
DCP114	EPA	5/14/2021	1	1		1
SAL133	EPA	5/15/2021		1		
ZIO433	NPS	5/17/2021	1	1		
SEK430	NPS	5/21/2021	1	1		1
ROM406	NPS	5/28/2021	1	1		1
GTH161	EPA	6/1/2021	1	1		1
KNZ184	EPA	6/8/2021	1			1
KIC003	EPA	6/9/2021	1			1
WSP144	EPA	6/12/2021	1	1		1
ARE128	EPA	6/13/2021		1		
VPI120	EPA	6/14/2021	1	1		1
SHN418	NPS	6/15/2021	1	1		1
LRL117	EPA	6/17/2021	1	1		1
PSU106	EPA	6/17/2021		1		
KEF112	EPA	6/18/2021		1		

# 1.4 Audit Results

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

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

# 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 Second Quarter 2021

This report presents the NADP sites surveyed during the second quarter (April through June) 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
SD04	NPS	4/5/2021	1		
MS19	NOAA	4/13/2021	1		
AR02	USGS	4/14/2021	1		
AR03	USGS	4/15/2021	1		1
GA41	U of GA	4/15/2021	1		1
NC25	USDA	4/16/2021			1
TX56	USGS	4/17/2021	1		
NC45	USGS	4/19/2021	1		
OK99	Cherokee Nation	4/21/2021		1	1
AR27	USGS	4/22/2021	1		
UT09	NPS	4/22/2021			1
AR16	NPS	4/23/2021	1		
MS30	USDA	5/1/2021	1		1
MS10	USGS	5/3/2021	1		
WY06	EPA	5/3/2021			1
WY94	NPS	5/5/2021			1
WY93	ARS	5/7/2021			1
NY67	EPA	5/10/2021			1
NY10	USGS	5/11/2021	1		
OH71	USGS	5/12/2021	1		
OH49	USGS	5/13/2021	1		
OH54	EPA	5/14/2021	1		1
IN20	USGS	5/15/2021			1
CA75	NPS	5/24/2021	1	1	
CO10	EPA	6/1/2021			1
KS24	KS dept of Health & Environment	6/7/2021		1	
KS31	KSU	6/8/2021	1		1
KS97	Kickapoo Tribe in KS	6/9/2021			1
KS05	KS dept of Health & Environment	6/10/2021		1	

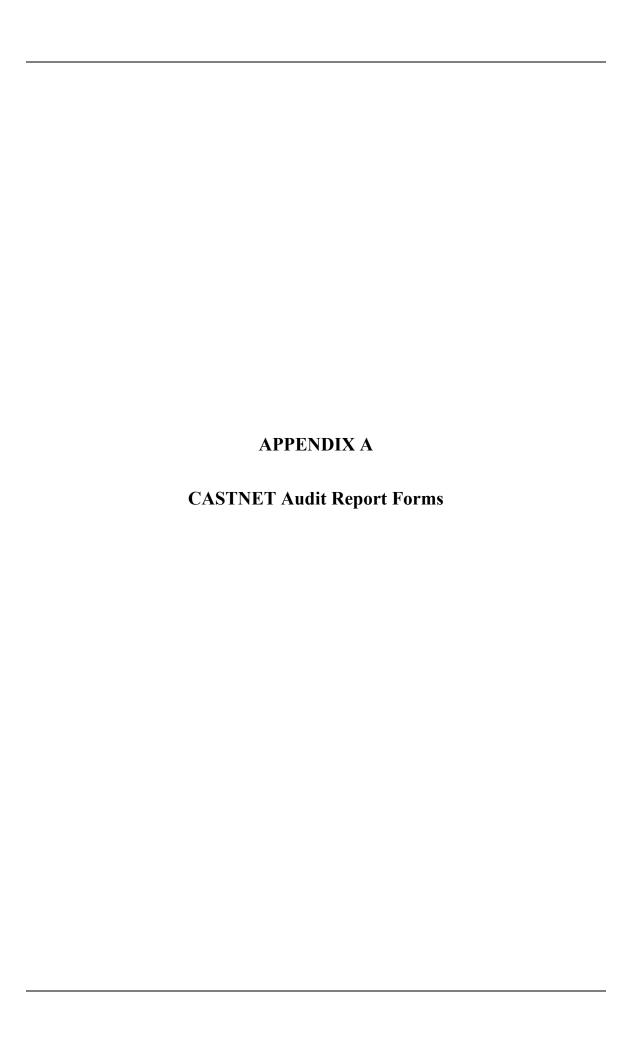
Site ID	Sponsor	Date	NTN	MDN	AMoN
KS07	USGS	6/10/2021	1		
OK31	OK dept of Environmental Quality	6/11/2021		1	
NJ98	EPA	6/12/2021			1
PA00	EPA	6/13/2021			1
VA13	EPA	6/14/2021	1		1
VA99	USDA	6/16/2021	1		
PA96	EPA	6/17/2021			1
PA97	EPA	6/17/2021			1
PA29	EPA	6/18/2021			1
NM07	NPS	6/28/2021	1		
TX04	NPS	6/29/2021	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 V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
WNC4	129-Marti	n Valvur-04/05/2021				
1	4/5/2021	Computer	Hewlett Packard	none	6560 b	5CB1520H5J
2	4/5/2021	DAS	Environmental Sys Corp	None	8832	A4868
3	4/5/2021	Elevation	Elevation	None	1	None
4	4/5/2021	Filter pack flow pump	Thomas	none	107CAB18	0688001767
5	4/5/2021	Flow Rate	Apex	none	AXMC105LPMDPCV	illegible
6	4/5/2021	Infrastructure	Infrastructure	none	none	none
7	4/5/2021	Met tower	unknown	none	unknown	none
8	4/5/2021	Sample Tower	Aluma Tower	none	В	none
9	4/5/2021	Shelter Temperature	ARS	none	none	none
10	4/5/2021	Shield (2 meter)	RM Young	none	43532	none
11	4/5/2021	Siting Criteria	Siting Criteria	None	1	None
12	4/5/2021	Temperature2meter	RM Young	none	41342	14264
13	4/5/2021	Zero air pump	Teledyne	none	701	1304

### **DAS Data Form** 1.2 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Primary Environmental Sys A4868 WNC429 Martin Valvur 04/05/2021 DAS Das Date: 4 /5 /2021 **Audit Date** 4 /5 /2021 ΗY Parameter DAS Mfg 08:49:48 08:51:00 **Das Time: Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** Das Day: 95 **Audit Day** 95 Tfer ID 01322 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0003 0.0005 0.0003 0.0005 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 V 1 0.0000 -0.0008 -0.0008 0.00001 0.1000 0.0997 0.0994 V V -0.0003 1 0.3000 0.2995 0.3000 V V 0.0005V V 1 0.5000 0.4995 0.4997 0.0002 V 0.7000 V -0.0005 1 0.6998 0.6993 V V 1 0.9000 0.9002 0.9004 0.0002 1 1.0000 0.9995 0.9992 V V -0.0003

# Flow Data Form Mfg Serial Number Tag Site Technician Site Visit Date Parameter Owner ID Apex Illegible WNC429 Martin Valvur 04/05/2021 Flow Rate none

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

<b>DAS 1:</b>	<b>DAS 2:</b>	Cal Factor Zero	-0.008
A Avg % Diff: A Max % Dif	A Avg %Diff A Ma	x % Dif Cal Factor Full Scale	5.03
1.02%		Rotometer Reading:	3.5

Desc.	Test type	Input 1/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.01	0.0000	0.05	l/m	1/m	
primary	leak check	0.000	0.000	0.00	0.0000	0.05	l/m	l/m	
primary	test pt 1	3.002	2.980	3.00	0.0000	3.03	l/m	l/m	1.78%
primary	test pt 2	2.996	2.970	2.99	0.0000	2.96	l/m	l/m	-0.51%
primary	test pt 3	3.012	2.990	2.99	0.0000	3.01	l/m	1/m	0.77%
Sensor Component Leak Test			Condition	1		Statu	s pass		
Sensor Comp	onent Tubing C	ondition		Condition	Good		Statu	s pass	
Sensor Component Filter Position			Condition	Poor		Statu	s Fail		
Sensor Comp	onent Rotomete	er Condition		Condition	Clean and dry		Statu	s pass	
Sensor Comp	onent Moisture	Present		Condition	No moisture pr	resent	Statu	s pass	

Sensor Component Rotometer Condition	Condition Clean and dry	Status pass
Sensor Component Moisture Present	Condition No moisture present	Status pass
Sensor Component Filter Distance	Condition 5 cm	Status pass
Sensor Component Filter Depth	Condition -2.5 cm	Status Fail
Sensor Component Filter Azimuth	Condition 360 deg	Status pass
Sensor Component System Memo	Condition See comments	Status pass

### 2 Meter Temperature Data Form Calc. Difference Serial Number Tag Site **Technician** Site Visit Date Parameter Mfg **Owner ID** WNC429 Martin Valvur 04/05/2021 RM Young 14264 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 1.68 UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Difference Test type Temp Low Rang 0.09 0.10 0.00001.78 C primary 1.68 23.26 23.27 0.0000 23.40 C 0.13 primary Temp Mid Range Temp High Rang primary 48.80 48.82 0.0000 48.85 C 0.03 Sensor Component | Shield **Condition** Clean Status pass Sensor Component Properly Sited **Condition** Properly sited Status pass Sensor Component Blower **Condition** Not functioning Status Fail Sensor Component System Memo Status pass **Condition**

### **Shelter Temperature Data For** Mfg **Serial Number Tag Site Technician** Site Visit Date Parameter **Owner ID** ARS WNC429 Martin Valvur 04/05/2021 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** 0.67 1.15 01229 **Tfer ID** 0.99975 -0.00824 **Slope** Intercept 2/9/2021 1.00000 CorrCoff**Cert Date**

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.35	24.36	0.000	25.5	C	1.15
primary	Temp Mid Range	25.07	25.08	0.000	25.6	C	0.47
primary	Temp Mid Range	25.45	25.46	0.000	25.9	C	0.4
Sensor Component System Memo			Condition	Status pass			

# **Siting Criteria Form**

<b>Sensor Component</b>	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 V	VNC429	Technician	Martin Valvur	Site Visit Date	04/05/2021
-----------	--------	------------	---------------	-----------------	------------

Shelter Make	Shelter Model	Shelter Size	
Ekto	8810 (s/n 3034-1)	640 cuft	

Sensor Component	Sample Tower Type	Condition	Туре В	Status	pass
Sensor Component	Conduit	Condition	Good	Status P	oass
Sensor Component	Met Tower	Condition	Good	Status p	oass
Sensor Component	Moisture Trap	Condition	Installed	Status p	oass
Sensor Component	Moisture Trap Type	Condition	Filter	Status p	pass
Sensor Component	Power Cables	Condition	Good	Status p	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	Dass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status p	oass
Sensor Component	Shelter walls	Condition	Good	Status p	pass
Sensor Component	Excessive mold present	Condition	Good	Status P	Dass
Sensor Component	Signal Cable	Condition	Good	Status P	Dass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status P	pass
Sensor Component	Sample Train	Condition	Good	Status P	Dass
Sensor Component	System Memo	Condition		Status P	Dass

# **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	d Problem
Flow Rate	WNC429	Martin Valvur	04/05/2021	Filter Position	Apex	4632		
The filter attachment porientation.	late is mounted t	too low in the enclos	sure resulting in	the filter being expe	osed to wind-driv	ven rain and in the	standard g	eometric
Temperature2meter	WNC429	Martin Valvur	04/05/2021	Blower	RM Young	4403		
The forced-air blower for the shield is not functioning.								

# **Field Systems Comments**

# 1 Parameter: SiteOpsProcComm

The general observations section of the SSRF is still not completed. Gloves are not used when handling the filter pack, however the filter bag is used as a glove.

# 2 Parameter: SiteOpsProcedures

The ozone analyzer is operated by the state of South Dakota and the sample train is now 1/4 Teflon with a filter at the inlet 4 meters above the ground.

### 3 Parameter: DocumentationCo

Records of the routine checks performed by the state of SD personnel are kept onsite in a logbook.

# 4 Parameter: ShelterCleanNotes

One shelter houses the ozone monitor and is in good condition and clean. The second shelter houses the flow system and IMPROVE. It is older and not climate controlled.

## 5 Parameter: PollAnalyzerCom

The dry deposition filter is mounted low in the enclosure which changes the particle collection characteristics, and can allow precipitation to enter.

### 6 Parameter: MetOpMaintCom

The temperature sensor signal cable insulation is cracked and showing signs of extreme wear. There are several sections covered with electrical tape.

### **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 04/05/2021 WNC429 Technician | Martin Valvur Site ID Wind Cave **USGS Map** NPS **Site Sponsor (agency)** Map Scale NPS and state of SD **Operating Group Map Date** 46-033-0132 AQS# R.M. Young **Meteorological Type** Ozone, NOx, PM2.5, PM10, IMPROVE Air Pollutant Analyzer **QAPP** Latitude 43.5578 dry, wet **QAPP** Longitude -103.4839 **Deposition Measurement** 1292 **Land Use** prairie - woodland - evergreen **QAPP Elevation Meters** Terrain rolling **QAPP Declination** Marginally Conforms to MLM **OAPP Declination Date** 43.557639 **Site Telephone Audit Latitude** Visitor Center -103.483856 Site Address 1 **Audit Longitude** Route 385 Wind Cave National Park Site Address 2 **Audit Elevation** 1288 Custer 8.1 **County Audit Declination** Hot Springs, SD City, State **Present** Fire Extinguisher 57747 Zip Code Mountain Time Zone **First Aid Kit 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 3034-1) Ekto **Shelter Size** 640 cuft **✓** Notes One shelter houses the ozone monitor and is in good condition and clean. The second shelter Shelter Clean houses the flow system and IMPROVE. It is older and not climate controlled.

From Hot Springs proceed north on 385 into Wind Cave National Park. Turn left onto the visitor center loop road.

The site operator's office is in the visitors center. The site is up the gravel access road to the park water supply on

**✓** Notes

the opposite side of the parking lot from the visitor center.

Site OK

**Driving Directions** 

Fic	eld Systems Data Form		F-02058-1500-S3-rev002
Site	WNC429 Technician Martin Valvur		Site Visit Date 04/05/2021
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	<b>✓</b>	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)	<b>✓</b>	N/A
3	Are the tower and sensors plumb?	<b>✓</b>	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	<b>✓</b>	
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)	<b>✓</b>	
6	Is the solar radiation sensor plumb?	<b>✓</b>	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	<b>✓</b>	N/A
8	Is the rain gauge plumb?	<b>✓</b>	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	<b>✓</b>	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	<b>✓</b>	N/A
11	Is it inclined approximately 30 degrees?	<b>✓</b>	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 WNC429 Technician Martin Valvur	Site Visit Date 04/05/2021
1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	
2	Are all the meteorological sensors operational online, and reporting data?	
3	Are the shields for the temperature and RH sensors clean?	
4	Are the aspirated motors working?	
5	Is the solar radiation sensor's lens clean and free of scratches?	✓ 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 necestral or man-made, that may affect the monitoring parameters	ssary) regarding conditions listed above, or any other features,
	emperature sensor signal cable insulation is cracked and showing ical tape.	g signs of extreme wear. There are several sections covered with

# Field Systems Data Form F-02058-1500-S5-rev002 WNC429 Technician | Martin Valvur Site Visit Date 04/05/2021 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? **V** Are the analyzers and monitors operational, on-line, and reporting data? Describe ozone sample tube. 1/4 inch teflon, 4 meters above ground 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? 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,

The dry deposition filter is mounted low in the enclosure which changes the particle collection characteristics, and can allow precipitation to

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

enter.

# Field Systems Data Form F-02058-1500-S6-rev002 WNC429 Technician Martin Valvur Site Visit Date 04/05/2021 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) Do the analyzer and sensor signal leads pass through lightning protection circuitry? Signs of wear Are the signal connections protected from the weather and well maintained? **✓** Are the signal leads connected to the correct DAS channel? shelter not grounded Are the DAS, sensor translators, and shelter properly grounded? **✓** Does the instrument shelter have a stable power source? **✓** Both on Is the instrument shelter temperature controlled? Grounded **Stable** Is the met tower stable and grounded? **✓ ✓** Is the sample tower stable and grounded? **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:

### WNC429 Technician | Martin Valvur Site Visit Date 04/05/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? Yes No N/A No N/A Yes **✓** Wind speed sensor Data logger **V V** Wind direction sensor Data logger ✓ **V** П **Temperature sensor** Strip chart recorder **V V** Relative humidity sensor Computer **V** П 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 $\checkmark$ ~ Shelter air conditioner Filter pack flow controller $\checkmark$ Filter pack MFC power supply Does the site have the required and most recent QC documents and report forms? Present Current **Station Log ✓ V** Dataview **SSRF ✓ V V V** Site Ops Manual Jan 2006 **HASP** Field Ops Manual **V Calibration Reports** Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ Dataview 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:

Records of the routine checks performed by the state of SD personnel are kept onsite in a logbook.

F-02058-1500-S7-rev002

Field Systems Data Form

### Field Systems Data Form F-02058-1500-S8-rev002 WNC429 Technician Martin Valvur Site Visit Date 04/05/2021 Site ID Site operation procedures Trained during site installation 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 site 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? Compliant **OC Check Performed** Frequency **Multi-point Calibrations V V** Quarterly **Automatic Zero/Span Tests V** Every 2 weeks Manual Zero/Span Tests **Automatic Precision Level Tests** Every 2 weeks **Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet)** In-line Filter Replacement (at analyze Sample Line Check for Dirt/Water **Zero Air Desiccant Check** 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 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 analyzer is operated by the state of South Dakota and the sample train is now 1/4 Teflon with a filter at the inlet 4 meters above the ground.

# Field Systems Data Form F-02058-1500-S9-rev002 WNC429 Technician Martin Valvur Site Visit Date 04/05/2021 Site ID **Site operation procedures** Is the filter pack being changed every Tuesday as scheduled? ✓ Filter changed morinings Are the Site Status Report Forms being completed and filed correctly? no longer required Are data downloads and backups being performed as scheduled? Are general observations being made and recorded? How? **~** Are site supplies on-hand and replenished in a timely fashion? SSRF Are sample flow rates recorded? How? Are samples sent to the lab on a regular schedule in a timely $\ lacksquare$ fashion? Gloves not used 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** ✓ As needed **V In-line Filter Inspection/Replacement** 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 general observations section of the SSRF is still not completed. Gloves are not used when handling the filter pack, however the filter bag

is used as a glove.

# **Field Systems Data Form**

# F-02058-1500-S10-rev002

Site ID WNC429 Technician Martin Valvur Site Visit Date 04/05/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB1520H5J	none
DAS	Environmental Sys Corp	8832	A4868	None
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0688001767	none
Flow Rate	Apex	AXMC105LPMDPC	illegible	none
Infrastructure	Infrastructure	none	none	none
Met tower	unknown	unknown	none	none
Sample Tower	Aluma Tower	В	none	none
Shelter Temperature	ARS	none	none	none
Shield (2 meter)	RM Young	43532	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	14264	none
Zero air pump	Teledyne	701	1304	none

# Site Inventory by Site Visit

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number					
NEC6	NEC602-Martin Valvur-04/06/2021										
1	4/6/2021	DAS	Campbell	none	CR1000	41007					
2	4/6/2021	elevation	Elevation	none	none	none					
3	4/6/2021	Filter pack flow pump	Thomas	none	107CAB18	061200041880					
4	4/6/2021	Flow Rate	Omega	none	FMA6518ST-RS232	394013					
5	4/6/2021	Infrastructure	Infrastructure	none	none	none					
6	4/6/2021	MFC power supply	Sceptre	none	FMA65PWC	295106-8					
7	4/6/2021	Ozone	ThermoElectron Inc	none	49i A1NAA	1214552974					
8	4/6/2021	Ozone Standard	ThermoElectron Inc	L0534683	49i E3CAA	1214552972					
9	4/6/2021	Sample Tower	Unknown	none	Unknown	None					
10	4/6/2021	Shelter Temperature	ARS	none	Thermocouple	none					
11	4/6/2021	siting criteria	Siting Criteria	none	none	None					
12	4/6/2021	Temperature2meter	Campbell	none	unknown	missing					
13	4/6/2021	Zero air pump	Thomas	none	107CAB18	079600005244					



### Flow Data Form **Technician** Mfg Serial Number Tag Site Site Visit Date Parameter **Owner ID** Martin Valvur 04/06/2021 394013 NEC602 Flow Rate none Omega Mfg BIOS Parameter Flow Rate Sceptre Mfg 148613 Tfer Desc. BIOS 220-H **Serial Number** 295106-8 none **SN/Owner ID** 01421 Tfer ID MFC power supply Parameter: 0.00160 **Slope** 1.00850 Intercept 2/10/2021 0.99999 CorrCoff **Cert Date** 0.98 **DAS 1: DAS 2:** Cal Factor Zero 0.988 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 1.65% 2.21% **Rotometer Reading:** Test type Input l/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignal PctDifference Desc. 0.000primary pump off 0.0000.00 0.0000.16 1/m1/m leak check 0.000 0.00 0.0000.13 1/ml/m0.000 primary 0.00 1/m 2.21% test pt 1 2.967 2.940 0.000 3.01 1/mprimary 2.974 2.950 0.00 0.000 3.00 1/m1/m1.76% primary test pt 2 0.00 0.0000.98% test pt 3 3.001 2.970 3.00 1/m1/mprimary Sensor Component Leak Test Status pass Condition Sensor Component Tubing Condition **Condition** Good Status pass Sensor Component Filter Position **Condition** Poor Status Fail Sensor Component Rotometer Condition Status pass Condition Not installed Sensor Component Moisture Present Condition No moisture present Status pass Sensor Component Filter Distance Condition 5.0 cm Status pass Condition -0.5 cm Status Fail **Sensor Component** Filter Depth

Condition 90 deg

Condition

**Sensor Component** Filter Azimuth

Sensor Component System Memo

Status pass

Status pass

# **Ozone Data Form**

Mfg	Serial Number	er Tag Site	7	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1214552974	NEC602	2	Martin Valvur	04/06/2021	Ozone	none
•	1.00194 <b>Slop</b>		0.00000	Mfg	ThermoElectron	Inc Paramet	<b>er</b> ozone
1		F-	0.00000	Serial Number	49CPS-70008-3	64 Tfer Des	c. Ozone primary stan
CorrCoff:	0.99998 Cor	rCoff:	0.00000	Tfer ID	01110		
DAS 1:	D.	AS 2:		Slope	1.0034	0 Intercept	0.02230
A Avg % Diff: A N	Max % Dif A	Avg %Diff A	Max % Dif				
0.0%	0.0%			Cert Date	1/20/202	CorrCoff	1.00000
UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.04	0.01	-0.01	ppb		-0.02
primary	2	16.65	16.48	16.60	ppb		0.12
primary	3	38.35	37.99	37.61	ppb	-1.01	
primary	4	67.56	66.95	66.60	ppb	-0.52	
primary	5	109.41	108.45	108.79	ppb	0.31	
Sensor Compone	ent Audit Press	ure	Cond	ition 638 mmHg		Status pass	
Sensor Compone	26.6 degree	unobstructed ru	le Cond	ition True		Status pass	
Sensor Compone	Tree dewlin	e >10m or below	inlet Cond	ition True		Status pass	
Sensor Compone	ADT <100 v	ehicles further th	nan 20 Cond	ition 143 m		Status Fail	
Sensor Compone	ent ADT >100 v	ehicles further th	nan 50 Cond	ition 143 m		Status Fail	
Sensor Compone	Sample Tra	in	Cond	Good Good		Status pass	
Sensor Compone	Inlet Filter C	Condition	Cond	ition Clean		Status pass	
Sensor Compone	Offset		Cond	otion 0.1		Status pass	
Sensor Compone	ent Span		Cond	ition 1.005		Status pass	
Sensor Compone	zero Voltag	е	Cond	ition N/A		Status pass	
Sensor Compone	ent Fullscale Vo	oltage	Cond	ition N/A		Status pass	
Sensor Compone	cent Cell A Freq.		Cond	ition 96.2 kHz		Status pass	
Sensor Compone	Cell A Noise	e	Cond	o.6 ppb		Status pass	
Sensor Compone	Cell A Flow		Cond	o.66 lpm		Status pass	
Sensor Compone	Cell A Press	sure	Cond	ition 624.5 mmHg		Status pass	
Sensor Compone	ent Cell A Tmp.		Cond	ition 26.8 C		Status pass	
Sensor Compone	ent Cell B Freq.		Cond	ition 90.2 kHz		Status pass	
Sensor Compone	ent Cell B Noise	•	Cond	ition 0.9 ppb		Status pass	
Sensor Compone	ent Cell B Flow		Cond	ition 0.68 lpm		Status pass	
Sensor Compone	ent Cell B Press	sure	Cond	ition 624.2 mmHg		Status pass	
Sensor Compone	System Mei	mo	Cond	ition		Status pass	
				-			

### 2 Meter Temperature Data Form Calc. Difference Serial Number Tag Site **Technician** Site Visit Date Parameter Mfg **Owner ID** NEC602 Martin Valvur 04/06/2021 Temperature2meter Campbell none missing Mfg Fluke Parameter Temperature 3275143 Tfer Desc. RTD **Serial Number** 01229 Tfer ID **Slope** 0.99975 **Intercept** -0.00824 **DAS 1: DAS 2: Cert Date** 2/9/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err CorrCoff 0.09 0.15 Difference UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Test type Temp Low Rang 0.02 0.03 0.000 $0.06\,\mathrm{C}$ 0.03 primary 23.82 23.83 0.000 23.98 C 0.15 primary Temp Mid Range Temp High Rang primary 47.84 47.86 0.000 47.96C 0.1 Sensor Component | Shield **Condition** Clean Status pass **Condition** Properly sited Sensor Component Properly Sited Status pass Sensor Component Blower **Condition** N/A 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 04/06/2021 none NEC602 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** 0.77 1.29 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 19.80 19.81 0.00019.0 $\mathbf{C}$ -0.81 19.50 19.51 C Temp Mid Range 0.00019.3 -0.21 primary C 18.30 18.31 0.000 19.6 1.29 primary Temp Mid Range

Condition

Sensor Component System Memo

Status pass

# **Siting Criteria Form**

<b>Sensor Component</b>	Limited agriculture operations	Condition	Status	pass
Sensor Component	City > 50,000	Condition	Status	pass
Sensor Component	City 1,000 to 10,000	Condition 2 km	Status	Fail
Sensor Component	City 10,000 to 50,000	Condition	Status	pass
Sensor Component	Feedlot operations	Condition	Status	pass
Sensor Component	Intensive agriculture operations	Condition	Status	pass
Sensor Component	Large point source of So2 or Nox	Condition < 10 km	Status	Fail
Sensor Component	Major highway, airport, or rail yard	Condition	Status	pass
Sensor Component	Major industrial source	Condition < 10 km	Status	Fail
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 NEC602 Technician Martin Valvur Site Visit Date 04/06/2021

Shelter Make	Shelter Model	Shelter Size	
Shelter One	AR 263648	24 cuft	

<b>Sensor Component</b>	Sample Tower Type	Condition	Pole type	Status	pass
<b>Sensor Component</b>	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	Not 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.	Hazar	d Problem
Flow Rate	NEC602	Martin Valvur	04/06/2021	Filter Depth	Omega	4633		
The filter attachment nle	te is mounted to	o low in the enclose	ira reculting in t	ha filtar haing avno	seed to wind dr	iven roin and in the	standard.	gaomatrio

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

## **Field Systems Comments**

1 Parameter: SiteOpsProcComm

The site operator does not use gloves to handle the filter pack. The bag is used as a glove to install and remove the filter.

2 Parameter: DocumentationCo

The site operator received a disc with the current QAPP which is kept at his office.

3 Parameter: SiteOpsProcedures

The site operator is aware that the desiccant is almost in need of replacement. Some of the items on the SSRF were discussed and the site operator's questions were answered regarding the correct procedures.

4 Parameter: SitingCriteriaCom

The site is located approximately 2 km northeast of Newcastle WY which has a population of approximately 3500. There is an oil refinery in Newcastle. A heavily traveled road is approximately 100m west of the site.

5 Parameter: ShelterCleanNotes

The shelter houses the ozone, DAS, and MFC only.

### F-02058-1500-S1-rev002 Field Systems Data Form NEC602 Technician | Martin Valvur Site Visit Date 04/06/2021 **Site ID USGS Map** EPA Site Sponsor (agency) **Map Scale** BLM **Operating Group Map Date** 560450003 AQS# Met One **Meteorological Type** Air Pollutant Analyzer **QAPP** Latitude **Deposition Measurement QAPP** Longitude **Land Use QAPP Elevation Meters** Terrain **QAPP Declination** Conforms to MLM **OAPP Declination Date** 43.8731 **Site Telephone Audit Latitude** -104.192009 Site Address 1 **Audit Longitude** Site Address 2 **Audit Elevation** 1469 Weston 8.2 **Audit Declination County** Newcastle, WY City, State **Present** Fire Extinguisher 82701 **Zip Code** Mountain 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 ~ Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail Shelter Working Room Make **Model** AR 263648 24 cuft Shelter One **Shelter Size** □ Notes The shelter houses the ozone, DAS, and MFC only. **Shelter Clean** □ Notes Site OK

**Driving Directions** 

Fi	eld Sy	stems Data Fo	rm				F-0203	58-150	00-S3-r	ev002
Site	e ID	NEC602	Technician	Martin Valvur		Site Visit Date	04/06/2021			
1		d speed and direction s fluenced by obstruction		as to avoid	<b>✓</b>	N/A				
2	Are wind (i.e. wind horizont	d sensors mounted so a d sensors should be mo ally extended boom >2 to the prevailing wind	as to minimize ounted atop the 2x the max dian	e tower or on a	<b>✓</b>	N/A				
3		tower and sensors plur			<b>✓</b>	N/A				
4		temperature shields po diated heat sources suc			<b>✓</b>					
5	condition surface a	perature and RH sensons? (i.e. ground below and not steeply sloped. water should be avoice	sensors should Ridges, hollov	be natural	<b>✓</b>					
6	Is the so	lar radiation sensor pl	umb?		<b>✓</b>	N/A				
7	Is it sited	l to avoid shading, or a	any artificial o	r reflected light?	<b>✓</b>	N/A				
8	Is the ra	in gauge plumb?			<b>✓</b>	N/A				
9	Is it sited towers, o	I to avoid sheltering ef	fects from buil	ldings, trees,	<b>✓</b>	N/A				
10	Is the su facing n	rface wetness sensor si orth?	ited with the gr	rid surface	<b>✓</b>	N/A				
11	Is it incl	ined approximately 30	degrees?		<b>✓</b>	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	NEC602 Technician Martin Valvur	Site Visit Date 04/06/2021
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 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
Site	NEC602 Technician Martin Valvur		Site Visit Date 04/06/2021
	Siting Criteria: Are the pollutant analyzers and deposition ed	<u>(uipı</u>	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?	<b>✓</b>	
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?	<b>✓</b>	
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 Nylon 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?	<b>✓</b>	
8	Are there moisture traps in the sample lines?		
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Not present
	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-S6-rev002 **Site ID** NEC602 Technician Martin Valvur Site Visit Date 04/06/2021 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) Not present Do the analyzer and sensor signal leads pass through lightning protection circuitry? **✓** Are the signal connections protected from the weather and well maintained? **V** 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:

#### NEC602 Technician | Martin Valvur Site Visit Date 04/06/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? Yes No N/A No N/A Yes Wind speed sensor Data logger П **V** $\checkmark$ П Wind direction sensor Data logger **V** $\checkmark$ П **Temperature sensor** Strip chart recorder **V** П **V** Relative humidity sensor Computer **V** П ✓ Solar radiation sensor Modem П 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** $\checkmark$ **V** Tipping bucket rain gauge Lightning protection device ~ $\checkmark$ **Shelter heater** Ozone analyzer ~ $\checkmark$ Shelter air conditioner Filter pack flow controller **~** Filter pack MFC power supply Does the site have the required and most recent QC documents and report forms? Present Current **Station Log** Not present **SSRF ✓ V ✓ V** Site Ops Manual 2013 **V HASP ✓** 2013 **✓** Field Ops Manual 2013 **V Calibration Reports** Not present Ozone z/s/p Control Charts Not present Preventive maintenance schedule Not present 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:

The site operator received a disc with the current QAPP which is kept at his office.

F-02058-1500-S7-rev002

Field Systems Data Form

### Field Systems Data Form NEC602 Technician Martin Valvur Site Visit Date 04/06/2021 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 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)** Not performed **Manual Rain Gauge Test ✓ V** Weekly **Confirm Reasonableness of Current Values 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 Manual Zero/Span Tests **V V** Daily **Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests ✓ V** Every 2 months **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? Unknown Are the automatic and manual z/s/p checks monitored and reported? If yes, how?

F-02058-1500-S8-rev002

Provide any additional 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 aware that the desiccant is almost in need of replacement. Some of the items on the SSRF were discussed and the site operator's questions were answered regarding the correct procedures.

Fie	ld Sy	stems Data For	rm				F-02058-	-1500-S9-rev002		
Site	ID	NEC602	Techniciar	Martin Valvur		Site Visit Date	04/06/2021			
	Site ope	ration procedures								
1	Is the fi	lter pack being changed	every Tueso	lay as scheduled	? 🗸	Filter changed morn	ings			
	Are the correctl	Site Status Report Forr y?	ns being con	pleted and filed	<b>✓</b>					
	Are data	a downloads and backu	ps being per	formed as		No longer required				
4	Are gen	eral observations being	made and re	ecorded? How?	<b>✓</b>	SSRF				
	Are site supplies on-hand and replenished in a timely fashion?				<b>✓</b>					
6	Are sample flow rates recorded? How?				<b>✓</b>	SSRF				
	Are san	nples sent to the lab on a	ı regular sch	edule in a timely	<b>~</b>					
		ers protected from conta	amination du	iring handling	✓					
		site conditions reported ons manager or staff?	l regularly to	the field						
QC (	Check P	erformed	Fre	equency			Compliant			
M	ulti-poi	nt MFC Calibrations	<b>✓</b> Se	miannually			<b>✓</b>			
		em Leak Checks	<b>✓</b> We	ekly			✓			
Fi	lter Pac	k Inspection								
Fl	ow Rate	Setting Checks	<b>✓</b> We	ekly			<b>✓</b>			
Vi	isual Ch	eck of Flow Rate Roton	neter No	t present						
In	-line Fil	ter Inspection/Replacen	nent 🗸 Se	miannually			$\checkmark$			
Sa	mple Li	ine Check for Dirt/Wate	er 🗸 We	ekly			<b>✓</b>			
		ndditional explanation (pan-made, that may affec				y) regarding condition	ons listed above, o	r any other features,		

The site operator does not use gloves to handle the filter pack. The bag is used as a glove to install and remove the filter.

## **Field Systems Data Form**

### F-02058-1500-S10-rev002

Site ID NEC602 Technician Martin Valvur Site Visit Date 04/06/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	41007	none
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CAB18	061200041880	none
Flow Rate	Omega	FMA6518ST-RS232	394013	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Sceptre	FMA65PWC	295106-8	none
Ozone	ThermoElectron Inc	49i A1NAA	1214552974	none
Ozone Standard	ThermoElectron Inc	49i E3CAA	1214552972	L0534683
Sample Tower	Unknown	Unknown	None	none
Shelter Temperature	ARS	Thermocouple	none	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Campbell	unknown	missing	none
Zero air pump	Thomas	107CAB18	079600005244	none

# Site Inventory by Site Visit

Site 1	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
BUF	603-Martir	ı Valvur-04/08/2021				
1	4/8/2021	DAS	Campbell	49917	CR1000	43073
2	4/8/2021	elevation	Elevation	none	none	none
3	4/8/2021	Filter pack flow pump	Thomas	none	107CAB18A	119900011286
4	4/8/2021	Flow Rate	Omega	none	FMA6518ST-RS232	315688-1
5	4/8/2021	Infrastructure	Infrastructure	none	none	none
6	4/8/2021	Sample Tower	Unknown	none	Unknown	None
7	4/8/2021	siting criteria	Siting Criteria	none	none	None
8	4/8/2021	Temperature2meter	Campbell	none	10755	Missing



#### Flow Data Form **Technician Owner ID** Mfg **Serial Number Tag Site** Site Visit Date Parameter BUF603 Martin Valvur 04/08/2021 Omega 315688-1 Flow Rate none 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** 0.371 **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** 1.70% 3.23% **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. primary pump off 0.0000.0000.00 0.0000.37 1/m1/m leak check 0.000 0.000 0.00 0.0000.37 1/ml/mprimary 2.990 0.00 1/m 0.43% test pt 1 3.018 0.000 3.00 1/mprimary 3.050 0.00 0.000 3.01 1/m1/m-1.44% primary test pt 2 3.080 0.00 0.0001/m-3.23% test pt 3 3.128 3.100 3.00 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 Not installed Sensor Component Moisture Present Condition No moisture present Status pass

Condition 6.0 cm

Condition 8.0 cm

Condition 180 deg

Condition

Status pass

Status pass

Status pass

Status pass

Sensor Component Filter Distance

Sensor Component Filter Depth

**Sensor Component** Filter Azimuth

Sensor Component System Memo

#### 2 Meter Temperature Data Form Calc. Difference Serial Number Tag Site **Technician** Site Visit Date Parameter Mfg **Owner ID** BUF603 Martin Valvur 04/08/2021 Campbell Missing 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: Cert Date** 2/9/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err CorrCoff 0.08 0.16 UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Difference Test type primary Temp Low Rang 0.29 0.30 0.000 0.14C -0.16 23.07 23.08 0.000 23.12 C 0.04 primary Temp Mid Range Temp High Rang primary 47.34 47.36 0.000 47.33 C -0.03 Sensor Component | Shield **Condition** Clean Status pass **Condition** Properly sited Sensor Component Properly Sited Status pass Sensor Component Blower **Condition** N/A Status pass Sensor Component System Memo Status pass **Condition**

# **Siting Criteria Form**

<b>Sensor Component</b>	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** BUF603 Site Visit Date 04/08/2021 Technician Martin Valvur **Site ID Shelter Make Shelter Model Shelter Size** Sensor Component | Sample Tower Type **Condition** Pole type 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 **Condition** Filter **Sensor Component** Moisture Trap Type Status pass Sensor Component Power Cables Status pass **Condition** Good **Condition** Functioning Sensor Component | Shelter Temp Control Status pass Sensor Component Rotometer **Condition** Not 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** N/A Status pass Sensor Component | Shelter walls **Condition** N/A Status pass Sensor Component Excessive mold present **Condition** Good Status pass Sensor Component | Signal Cable **Condition** Good Status pass Condition 3/8 teflon Sensor Component Tubing Type Status pass

**Condition** Good

**Condition** 

Status pass

Status pass

Sensor Component Sample Train

Sensor Component System Memo

## **Field Systems Comments**

1 Parameter: DasComments

The NEMA enclosure has a cooling fan.

2 Parameter: DocumentationCo

A disc with the current QAPP has been received and is kept at the site operator's office. The site operator completes and files a hardcopy checklist developed by ARS for BLM each week.

3 Parameter: ShelterCleanNotes

NEMA enclosure, 120 VAC power

4 Parameter: PollAnalyzerCom

The dry deposition filter pack enclosure is not the standard "pot" size that is used at the other CASTNET sites. The diameter of the enclosure is much smaller and the filter is mounted much deeper inside the opening. The geometry of the filter pack and enclosure is likely to impact particle collection efficiency.

5 Parameter: MetSensorComme

The temperature is measured at 2.5 meters above the ground.

### F-02058-1500-S1-rev002 Field Systems Data Form BUF603 Technician | Martin Valvur Site Visit Date 04/08/2021 **Site ID USGS Map** EPA Site Sponsor (agency) **Map Scale** BLM **Operating Group Map Date** AQS# **Meteorological Type** Air Pollutant Analyzer **QAPP** Latitude **Deposition Measurement QAPP** Longitude **Land Use QAPP Elevation Meters Terrain QAPP Declination OAPP Declination Date** Conforms to MLM 44.144135 **Site Telephone Audit Latitude** -106.108771 **Site Address 1 Audit Longitude** 1320 Site Address 2 **Audit Elevation** Johnson 9.3 **Audit Declination County** City, State Buffalo, WY **Present** Fire Extinguisher 82834 **Zip Code** Mountain 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 ~ Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail Shelter Working Room Make Model **Shelter Size** □ Notes NEMA enclosure, 120 VAC power **Shelter Clean** □ Notes Site OK

**Driving Directions** 

l 1	eia Sy	stems Data Fo	)rm				F-020	30-13	500- <b>S</b> 3-rev0	/UZ
Sit	e ID	BUF603	Technician	Martin Valvur		Site Visit Date	04/08/2021			
1		d speed and direction fluenced by obstruction		as to avoid	<b>✓</b>					
2	(i.e. win	d sensors mounted so d sensors should be me tally extended boom > nto the prevailing wind	ounted atop the 2x the max dian	tower or on a	<b>✓</b>					
3	Are the	tower and sensors plu	mb?		<b>✓</b>					
4		temperature shields p idiated heat sources su			<b>✓</b>					
5	condition surface	perature and RH sensons? (i.e. ground below and not steeply sloped g water should be avoi	sensors should. Ridges, hollow	be natural	<b>✓</b>					
6	Is the so	olar radiation sensor p	lumb?		<b>✓</b>					
7	Is it site	d to avoid shading, or	any artificial or	reflected light?	<b>✓</b>					
8	Is the ra	ain gauge plumb?			<b>✓</b>					
9	Is it site towers,	d to avoid sheltering e etc?	ffects from build	lings, trees,		45 degree rule viola	ation			
10	Is the su facing n	urface wetness sensor s orth?	sited with the gr	id surface	<b>✓</b>	N/A				
11	Is it inc	clined approximately 3	0 degrees?		<b>✓</b>	N/A				
		additional explanational endication				y) regarding condi	tions listed at	oove, or	any other features	5,

The temperature is measured at 2.5 meters above the ground.

Field Systems Data Form	F-02058-1500-S4-rev002		
Site ID BUF603 Technician Martin Valvur	Site Visit Date 04/08/2021		
1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?			
2 Are all the meteorological sensors operational online, and reporting data?			
3 Are the shields for the temperature and RH sensors clean?			
4 Are the aspirated motors working?	✓ N/A		
5 Is the solar radiation sensor's lens clean and free of scratches?			
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?			
Are the sensor signal and power cable connections protected from the elements and well maintained?			
Provide any additional explanation (photograph or sketch if necessatural or man-made, that may affect the monitoring parameters			

### Field Systems Data Form F-02058-1500-S5-rev002 BUF603 Technician | Martin Valvur Site Visit Date 04/08/2021 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 **✓** N/A Do the analyzers and equipment appear to be in good condition and well maintained? **✓** N/A Are the analyzers and monitors operational, on-line, and reporting data? Describe ozone sample tube. N/A Describe dry dep sample tube. 3/8 teflon by 10 meters **✓** N/A Are in-line filters used in the ozone sample line? (if ves indicate location) **~** Are sample lines clean, free of kinks, moisture, and obstructions? **✓** N/A Is the zero air supply desiccant unsaturated? Not present Are there moisture traps in the sample lines? Is there a rotometer in the dry deposition filter line, and is it Not present 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 dry deposition filter pack enclosure is not the standard "pot" size that is used at the other CASTNET sites. The diameter of the enclosure is much smaller and the filter is mounted much deeper inside the opening. The geometry of the filter pack and enclosure is likely to impact particle collection efficiency.

### Field Systems Data Form F-02058-1500-S6-rev002 BUF603 Technician Martin Valvur Site Visit Date 04/08/2021 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) Not present 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? Marginally 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** 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 NEMA enclosure has a cooling fan.

#### BUF603 Site Visit Date 04/08/2021 Site ID Technician Martin Valvur **Documentation** Does the site have the required instrument and equipment manuals? Yes No N/A No N/A Yes **V** Wind speed sensor **V** Data logger **V V** Wind direction sensor Data logger ✓ П **V Temperature sensor** Strip chart recorder **V V** Relative humidity sensor **Computer V** П П **V** Solar radiation sensor **Modem** П П **V V Printer** Surface wetness sensor $\checkmark$ **V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump **V V Humidity sensor translator Surge protector** П **~ UPS V Solar radiation translator** П П **V V** Tipping bucket rain gauge Lightning protection device **V V** Ozone analyzer **Shelter heater** $\checkmark$ **V** Shelter air conditioner Filter pack flow controller **~** Filter pack MFC power supply Does the site have the required and most recent QC documents and report forms? Present Current **Station Log** Not present **SSRF ✓ V V V** Site Ops Manual 2013 **V HASP V** 2013 Field Ops Manual **V** 2013 **V Calibration Reports** Not present Ozone z/s/p Control Charts N/A **V** Preventive maintenance schedule Not present 1 Not present 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? **~** N/A 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: A disc with the current QAPP has been received and is kept at the site operator's office. The site operator completes and files a hardcopy

F-02058-1500-S7-rev002

Field Systems Data Form

checklist developed by ARS for BLM each week.

#### Field Systems Data Form F-02058-1500-S8-rev002 BUF603 Technician Martin Valvur Site Visit Date 04/08/2021 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 V** Weekly **Confirm Reasonableness of Current Values 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** N/A **V** N/A **Automatic Zero/Span Tests V** N/A Manual Zero/Span Tests **V** N/A **Automatic Precision Level Tests V** N/A **Manual Precision Level Test V** N/A **Analyzer Diagnostics Tests ~** N/A **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V** N/A Sample Line Check for Dirt/Water **~** N/A **Zero Air Desiccant Check ✓** N/A 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 N/A complete sample train including all filters? **✓** N/A 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		
Sit	e ID	BUF603	echnician Martin Valvur		Site Visit Date	e 04/08/2021
	Site ope	ration procedures				
1	Is the fi	ter pack being changed evo	ery Tuesday as scheduled?	<b>V</b>	Filter changed mor	rnings
2	Are the correctl	Site Status Report Forms by?	peing completed and filed	<b>✓</b>		
3	Are dat	a downloads and backups bed?	eing performed as		No longer required	İ
4	Are gen	eral observations being ma	de and recorded? How?	<b>✓</b>	SSRF	
5	Are site fashion	supplies on-hand and replo	enished in a timely	<b>✓</b>		
6	Are san	ple flow rates recorded? H	ow?	<b>✓</b>	SSRF	
7	Are san	uples sent to the lab on a re	gular schedule in a timely	<b>✓</b>		
8 Are filters protected from contamination during handling and shipping? How?		<b>✓</b>	One set of gloves	only		
9		site conditions reported resons manager or staff?	gularly to the field			
QC	Check P	erformed	Frequency			Compliant
I	Multi-poi	nt MFC Calibrations	<b>✓</b> Semiannually			✓
]	Flow Syst	em Leak Checks	✓ Weekly			✓
J	Filter Pac	k Inspection				
]	Flow Rate	<b>Setting Checks</b>	✓ Weekly			✓
1	Visual Ch	eck of Flow Rate Rotomete	•			
1	In-line Fil	ter Inspection/Replacemen	t ✓ Semiannually			<b>V</b>
5	Sample Line Check for Dirt/Water					
		dditional explanation (pho n-made, that may affect th			r) regarding condit	tions listed above, or any other features,

## **Field Systems Data Form**

### F-02058-1500-S10-rev002

Site ID BUF603 Technician Martin Valvur Site Visit Date 04/08/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	43073	49917
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CAB18A	119900011286	none
Flow Rate	Omega	FMA6518ST-RS232	315688-1	none
Infrastructure	Infrastructure	none	none	none
Sample Tower	Unknown	Unknown	None	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Campbell	10755	Missing	none

# Site Inventory by Site Visit

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number	
SHE604-Martin Valvur-04/08/2021							
1	4/8/2021	DAS	Campbell	none	CR1000	unknown1	
2	4/8/2021	elevation	Elevation	none	none	none	
3	4/8/2021	Flow Rate	Omega	none	FMA6518ST-RS232	324333-2	
4	4/8/2021	Infrastructure	Infrastructure	none	none	none	
5	4/8/2021	Sample Tower	Unknown	none	Unknown	None	
6	4/8/2021	siting criteria	Siting Criteria	none	none	None	
7	4/8/2021	Temperature2meter	Campbell	none	10755	Illegible	



#### Flow Data Form **Technician Owner ID** Mfg **Serial Number Tag Site** Site Visit Date Parameter SHE604 Martin Valvur 04/08/2021 Omega 324333-2 Flow Rate none 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** 0.377 **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** 2.04% 2.39% **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. primary pump off 0.0000.0000.00 0.0000.38 1/m1/m leak check 0.000 0.00 0.0000.38 1/ml/m0.000 primary 0.00 1/m 2.04% test pt 1 2.970 2.940 0.000 3.00 1/mprimary 2.980 2.950 0.00 0.000 3.00 1/m1/m1.69% primary test pt 2 0.00 0.0001/m2.39% test pt 3 2.960 2.930 3.00 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 Not installed Sensor Component Moisture Present Condition No moisture present Status pass Sensor Component Filter Distance

Condition 3.0 cm

Condition 1.5 cm

Condition 300 deg

Condition

Sensor Component Filter Depth

**Sensor Component** Filter Azimuth

Sensor Component System Memo

Status pass

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** SHE604 Martin Valvur 04/08/2021 Temperature2meter Campbell Illegible none Mfg Fluke Parameter Temperature 3275143 Tfer Desc. RTD **Serial Number** 01229 Tfer ID **Slope** 0.99975 **Intercept** -0.00824 **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 0.09 UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Difference Test type primary Temp Low Rang 0.12 0.13 0.000 0.08C -0.05 24.59 24.60 0.000 24.69 C 0.09 primary Temp Mid Range Temp High Rang primary 47.78 47.80 0.000 47.86C 0.06 Sensor Component | Shield **Condition** Clean Status pass Sensor Component Properly Sited **Condition** Properly sited Status pass Sensor Component Blower **Condition** N/A Status pass Sensor Component System Memo Status pass **Condition**

# **Siting Criteria Form**

<b>Sensor Component</b>	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 Visit Date 04/08/2021 SHE604 Technician Martin Valvur **Site ID Shelter Make Shelter Model Shelter Size** Sensor Component | Sample Tower Type Condition Pole type 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 Status pass **Condition** Good Sensor Component | Shelter Temp Control **Condition** N/A Status pass **Condition** Not installed Sensor Component Rotometer 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** N/A Status pass Sensor Component | Shelter walls **Condition** N/A Status pass Sensor Component Excessive mold present **Condition** Good Status pass Sensor Component | Signal Cable **Condition** Good Status pass Condition 3/8 teflon **Sensor Component** Tubing Type Status pass

**Condition** Good

**Condition** 

Status pass

Status pass

Sensor Component Sample Train

Sensor Component System Memo

## **Field Systems Comments**

1 Parameter: DasComments

The site power source is solar and wind with battery storage. The NEMA enclosure has a cooling fan.

2 Parameter: SiteOpsProcedures

observations of current meteorological measurements are recorded on a hardcopy checklist for ARS and not on the SSRF.

3 Parameter: DocumentationCo

The site operator is supplied with a disc containing the QAPP, operating procedures, and HASP which is kept at his office. A hard copy BLM check list developed by ARS is completed and sent to ARS each week. Standard CASTNET SSRF forms are being used now.

4 Parameter: SitingCriteriaCom

The site is located in range land. There is an active rail line with coal trains within one kilometer of the site.

5 Parameter: ShelterCleanNotes

NEMA enclosure, wind and solar power

6 Parameter: PollAnalyzerCom

The dry deposition filter pack enclosure is not the standard "pot" size as at the other CASTNET sites. The diameter is much smaller. It is not clear if this will impact particle collection efficiency.

7 Parameter: MetSensorComme

The site is a small footprint solar powered site that has been operating as part of the WARMS network for more than 10 years. Objects violate the 45 degree rule for the tipping bucket rain gage. The temperature and RH are being measured at 2.5 meters above the ground.

8 Parameter: MetOpMaintCom

The accuracy of the DAS was not tested with a voltage source since there were no available test channels.

#### F-02058-1500-S1-rev002 Field Systems Data Form SHE604 Technician | Martin Valvur Site Visit Date 04/08/2021 **Site ID USGS Map** EPA Site Sponsor (agency) **Map Scale** BLM **Operating Group Map Date** AQS# Met One **Meteorological Type Air Pollutant Analyzer QAPP** Latitude **Deposition Measurement QAPP** Longitude **Land Use QAPP Elevation Meters Terrain QAPP Declination OAPP Declination Date** Conforms to MLM 44.933601 **Site Telephone Audit Latitude** -106.847161 Site Address 1 **Audit Longitude** Site Address 2 **Audit Elevation** 1141 Sheridan 9.8 **Audit Declination County** City, State Sheridan, WY **Present** Fire Extinguisher 82801 **Zip Code** Mountain 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 ~ Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail Shelter Working Room Make Model **Shelter Size ✓** Notes NEMA enclosure, wind and solar power **Shelter Clean** □ Notes Site OK

**Driving Directions** 

Fi	eld Systems Data Form		F-02058-1500-S3-rev002				
Sit	e ID SHE604 Technician Martin Valvur		Site Visit Date 04/08/2021				
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)	<b>✓</b>					
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?	<b>✓</b>					
7	Is it sited to avoid shading, or any artificial or reflected light?	✓					
8	Is the rain gauge plumb?						
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?		45 degree rule violation				
10	Is the surface wetness sensor sited with the grid surface facing north?	<b>✓</b>	N/A				
11	Is it inclined approximately 30 degrees?	<b>✓</b>	N/A				
nat The	ovide any additional explanation (photograph or sketch if necestural or man-made, that may affect the monitoring parameters:  e site is a small footprint solar powered site that has been operating late the 45 degree rule for the tipping bucket rain gage. The temper	as p	art of the WARMS network for more than 10 years. Objects				

Fic	eld Systems Data Form		F-02058-1500-S4-rev002
Site	ID SHE604 Technician Martin Valvur		Site Visit Date 04/08/2021
1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	<b>✓</b>	
2	Are all the meteorological sensors operational online, and reporting data?	<b>✓</b>	
3	Are the shields for the temperature and RH sensors clean?	✓	
4	Are the aspirated motors working?	<b>V</b>	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	<b>✓</b>	
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?	<b>✓</b>	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	<b>✓</b>	
natu	ide any additional explanation (photograph or sketch if necessal or man-made, that may affect the monitoring parameters:	• /	
The a	accuracy of the DAS was not tested with a voltage source since the	ere w	ere no available test channels.

### Field Systems Data Form F-02058-1500-S5-rev002 SHE604 Technician | Martin Valvur Site Visit Date 04/08/2021 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 **✓** N/A Do the analyzers and equipment appear to be in good condition and well maintained? **✓** N/A Are the analyzers and monitors operational, on-line, and reporting data? Describe ozone sample tube. N/A Describe dry dep sample tube. 3/8 teflon by 10 meters ✓ N/A Are in-line filters used in the ozone sample line? (if ves indicate location) **~** Are sample lines clean, free of kinks, moisture, and obstructions? **✓** N/A Is the zero air supply desiccant unsaturated? in-line filter Are there moisture traps in the sample lines? Is there a rotometer in the dry deposition filter line, and is it Not present clean? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,

The dry deposition filter pack enclosure is not the standard "pot" size as at the other CASTNET sites. The diameter is much smaller. It is not

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

clear if this will impact particle collection efficiency.

### Field Systems Data Form F-02058-1500-S6-rev002 SHE604 Technician | Martin Valvur Site Visit Date 04/08/2021 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) Not present 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? Marginally 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** 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 site power source is solar and wind with battery storage. The NEMA enclosure has a cooling fan.

Field Systems Da	ta Form				F-02	2058-	1500-S7-rev002
Site ID SHE604	Tec	chnician Martin	Valvur	Site Visit Date	04/08/2021	1	
<b>Documentation</b>							
Does the site have the req	uired instrui	ment and equip	ment manuals?				
	Yes N				Yes	No	N/A
Wind speed sensor			Data logger				
Wind direction sensor			Data logger				
Temperature sensor			Strip chart	recorder			<b>V</b>
Relative humidity sensor			Computer				<b>✓</b>
Solar radiation sensor			Modem				
Surface wetness sensor			Printer				<b>V</b>
Wind sensor translator		_	Zero air pu	_		□	<b>V</b>
Temperature translator		_	Filter flow	_			
Humidity sensor translator		_	Surge prote	ector			<b>V</b>
Solar radiation translator			UPS				<b>V</b>
Tipping bucket rain gauge		_		protection device			<b>V</b>
Ozone analyzer			Shelter hea				
Filter pack flow controller			Shelter air	conditioner			✓
Filter pack MFC power sup	ply 🗀 🗀						
Does the site have the re	equired and r	nost recent QC	documents and	report forms?			
	Present				Curre	ent	
<b>Station Log</b>	<b>✓</b>						
SSRF	<b>✓</b>				✓		
Site Ops Manual	<b>✓</b>	2013			✓		
HASP	<b>✓</b>	2013			✓		
Field Ops Manual	<b>✓</b>	2013			<b>✓</b>		
<b>Calibration Reports</b>		Not present					
Ozone z/s/p Control Charts							
Preventive maintenance sch	edule						
1 Is the station log prope	rly completed	d during every s	ite visit?				
2 Are the Site Status Rep current?	ort Forms be	eing completed a	and 🗸				
3 Are the chain-of-custod sample transfer to and		perly used to do	cument 🗸				
4 Are ozone z/s/p control current?	charts prope	erly completed a	ınd ✓ N/	A			
Provide any additional explanatural or man-made, that is				egarding condition	ons listed	above, o	r any other features,
The site operator is supplied v check list developed by ARS is							

#### Field Systems Data Form F-02058-1500-S8-rev002 SHE604 Technician Martin Valvur Site Visit Date 04/08/2021 Site ID Site operation procedures Training provided by ARS 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** N/A **Translator Zero/Span Tests (climatronics) ✓ V** Monthly **Manual Rain Gauge Test V V** Weekly **Confirm Reasonableness of Current Values** 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** N/A **V** N/A **Automatic Zero/Span Tests V** N/A Manual Zero/Span Tests **V** N/A **Automatic Precision Level Tests V** N/A **Manual Precision Level Test V** N/A **Analyzer Diagnostics Tests V** N/A **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V** N/A Sample Line Check for Dirt/Water **~** N/A **Zero Air Desiccant Check ✓** N/A 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 N/A complete sample train including all filters? **✓** N/A 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:

observations of current meteorological measurements are recorded on a hardcopy checklist for ARS and not on the SSRF.

Field Systems Data Form		F-02058-1500-S9-rev002
Site ID SHE604 Te	chnician Martin Valvur	Site Visit Date 04/08/2021
Site operation procedures		
1 Is the filter pack being changed ever	ry Tuesday as scheduled?	Pilter changed mornings
2 Are the Site Status Report Forms be correctly?	eing completed and filed	
3 Are data downloads and backups be scheduled?	eing performed as	No longer required
4 Are general observations being made	le and recorded? How?	<b>✓</b> SSRF
5 Are site supplies on-hand and reple fashion?	nished in a timely	
6 Are sample flow rates recorded? Ho	ow?	<b>✓</b> SSRF
7 Are samples sent to the lab on a reg fashion?	ular schedule in a timely	y 🗹
8 Are filters protected from contamin and shipping? How?	ation during handling	✓ One set of gloves only
9 Are the site conditions reported reg operations manager or staff?	ularly to the field	
QC Check Performed	Frequency	Compliant
<b>Multi-point MFC Calibrations</b>	<b>✓</b> Semiannually	✓
Flow System Leak Checks	Weekly	✓
Filter Pack Inspection		
Flow Rate Setting Checks	✓ Weekly	✓
Visual Check of Flow Rate Rotometer	Not present	
In-line Filter Inspection/Replacement	<b>✓</b> Semiannually	✓
Sample Line Check for Dirt/Water		
Provide any additional explanation (phot		essary) regarding conditions listed above, or any other features,

# **Field Systems Data Form**

## F-02058-1500-S10-rev002

Site ID SHE604 Technician Martin Valvur Site Visit Date 04/08/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	unknown1	none
elevation	Elevation	none	none	none
Flow Rate	Omega	FMA6518ST-RS232	324333-2	none
Infrastructure	Infrastructure	none	none	none
Sample Tower	Unknown	Unknown	None	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Campbell	10755	Illegible	none

# Site Inventory by Site Visit

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
CAD150-Eric Hebert-04/15/2021										
1	4/15/2021	Computer	Dell	07029	Inspiron 15	Unknown				
2	4/15/2021	DAS	Campbell	000421	CR3000	2530				
3	4/15/2021	Elevation	Elevation	None	1	None				
4	4/15/2021	Filter pack flow pump	Thomas	00462	107CA110	09883403-01-4				
5	4/15/2021	Flow Rate	Apex	000599	AXMC105LPMDPCV	illegible				
6	4/15/2021	Infrastructure	Infrastructure	none	none	none				
7	4/15/2021	Modem	Digi	07195	LRS4	unknown				
8	4/15/2021	Ozone	ThermoElectron Inc	000724	49i A1NAA	1105347328				
9	4/15/2021	Ozone Standard	ThermoElectron Inc	000439	49i A3NAA	CM08200015				
10	4/15/2021	Sample Tower	Aluma Tower	03538	Α	none				
11	4/15/2021	Shelter Temperature	Campbell	none	107-L	none				
12	4/15/2021	Siting Criteria	Siting Criteria	None	1	None				
13	4/15/2021	Temperature	RM Young	04682	41342VC	9699				
14	4/15/2021	Zero air pump	Werther International	06937	C 70/4	000821896				

#### **DAS Data Form** 1.67 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Primary Campbell 2530 CAD150 Eric Hebert 04/15/2021 DAS Das Date: 4 /15/2021 **Audit Date** 4 /15/2021 Datel Parameter DAS Mfg 09:26:00 09:24:20 **Das Time: Audit Time** 4000392 Tfer Desc. Source generator (D **Serial Number** 105 105 Das Day: **Audit Day** Tfer ID 01321 **Low Channel: High Channel: Avg Diff: Avg Diff: Max Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0001 0.0001 0.0001 0.0001 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 0.0000 V 0.0000 0.0000 0.00007 0.1000 0.1079 0.1078 V V -0.0001 7 0.3000 0.3238 0.3237 V V -0.0001 V V 7 0.5000 0.5003 0.5004 0.0001 V 0.7000 V 0.00007 0.7006 0.7006 V V 0.9000 0.9005 0.9005 0.00007 1.0000 1.0005 1.0006 V V 0.0001

#### Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter 04/15/2021 000599 Apex illegible CAD150 Eric Hebert 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** -0.03 **DAS 2: DAS 1:** Cal Factor Zero 0.98 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.22% 0.66% 1.55 **Rotometer Reading:** Desc. Test type Input l/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignal PctDifference 1/mprimary pump off 0.000 0.0000.01 0.000-0.021/mleak check 0.000 0.000 0.01 0.0000.001/ml/mprimary 1.52 0.000 1/m 0.00% test pt 1 1.527 1.500 1.50 1/mprimary 1.500 1.52 0.000 1.50 1/m1/m0.00% primary test pt 2 1.528 0.0001/m-0.66% test pt 3 1.538 1.510 1.52 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 See comments Status pass Sensor Component Filter Distance Condition 4.5 cm Status pass Sensor Component Filter Depth Condition 2.0 cm Status pass

Condition 270 deg

Condition

**Sensor Component** Filter Azimuth

Sensor Component System Memo

Status pass

Status pass

## **Ozone Data Form**

Mfg		Serial Numb	er Tag Site		Te	chnician	Site Visit Date	Parame	eter	Owner ID
ThermoElec	tron Inc	1105347328	CAD15	0	Er	ic Hebert	04/15/2021	Ozone		000724
Slope: Intercept CorrCoff:	_		ercept	0.00000 0.00000 0.00000	)	Mfg Serial Number Tfer ID	ThermoElectron 1180930075 01115			ozone c. Ozone primary stan
DAS 1:		D	AS 2:				1.0056	30 Into	t	0.14070
	oiff: A N		Avg %Diff A	Max 9	% Dif	Slope			сері	
	0%	0.0%				Cert Date	4/7/20	21 Corr	·Coff	0.99990
UseDescr	iption	ConcGroup	Tfer Raw	Tf	er Corr	Site	Site Unit	RelPer	Dif	AbsDif
prima		1	0.61		0.46	0.68	ppb			0.22
prima	•	2	14.84		14.42	14.49	ppb			0.07
prima	•	3	31.79		31.06	31.18	ppb		0.39	
prima	•	4	67.57		66.18	67.14	ppb		1.44	
prima		5	113.30	_	11.06	112.90	ppb		1.64	
-	•	ent Audit Press		1		754.8 mmHg	ppo	Status		
			e unobstructed ru	ıle		on False		Status		
	_		ne >10m or belov							
	_				Condition			Status		
	•		vehicles further t					Status	Fail	
Sensor C	ompone	ADT >100	vehicles further t	han 50	Condition	on True		Status	pass	
Sensor C	ompone	ent Sample Tra	nin		Condition	Good		Status	pass	
Sensor C	ompone	ent Inlet Filter (	Condition		Conditio	on Dirty		Status	Fail	
Sensor C	ompone	ent Offset			Condition	on -0.50		Status	pass	
Sensor C	ompone	ent Span			Conditio	on 1.028		Status	pass	
Sensor C	ompone	zero Voltag	je		Condition	on N/A		Status	pass	
Sensor C	ompone	ent Fullscale V	oltage		Condition	on N/A		Status	pass	
Sensor C	ompone	Cell A Freq			Condition	92.1 kHz		Status	pass	
Sensor C	ompone	ent Cell A Nois	e		Condition	0.5 ppb		Status	pass	
Sensor C	ompone	ent Cell A Flow	1		Condition	0.72 lpm		Status	pass	
Sensor C	ompone	ent Cell A Pres	sure		Condition	715.3 mmHg		Status	pass	
Sensor C	ompone	Cell A Tmp			Condition	35.7 C		Status	pass	
Sensor C	ompone	Cell B Freq			Condition	on 99.3 kHz		Status		
Sensor C	ompone	ent Cell B Nois	e		Condition	0.6 ppb		Status	pass	
Sensor C	ompone	ent Cell B Flow	•			0.71 lpm		Status		
	_	ent Cell B Pres				715.9 mmHg		Status		
	•	System Me			Condition			Status		

#### **Temperature Data Form** Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg RM Young 9699 CAD150 Eric Hebert 04/15/2021 Temperature 04682 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 0.16 0.30 UseDesc. InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference Test type primary Temp Low Range 0.38 0.22 0.0000.5 $\mathbf{C}$ 0.3 C Temp Mid Range 23.84 23.50 0.000 23.4 -0.09 primary 0.000 C -0.09 primary Temp High Range 47.12 46.61 46.5 **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** 04/15/2021 Campbell none CAD150 Eric Hebert 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** 1.86 1.90 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 22.51 22.18 0.00024.0 $\mathbf{C}$ 1.81 C Temp Mid Range 22.29 21.96 0.00023.9 1.9 primary Sensor Component System Memo Condition Status pass

# **Siting Criteria Form**

<b>Sensor Component</b>	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	CAD150	Technician	Eric Hebert	Site Visit Date	04/15/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component Sample Tower Type	Condition	Туре А	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	Poor	Status Fail
Sensor Component Shelter walls	Condition	Good	Status pass
Sensor Component Excessive mold preser	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

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazaro	Problem
Flow Rate	CAD150	Eric Hebert	04/15/2021	Moisture Present	Apex	4207		

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

# **Field Systems Comments**

1 Parameter: SiteOpsProcedures

The ozone analyzer sample train filter is replaced and the system is leak tested quarterly.

2 Parameter: ShelterCleanNotes

Some shelter floor tiles are cracked and there is indication of insect damage below the heater. The floor is continuing to rot under the tiles.

3 Parameter: PollAnalyzerCom

There is a moisture trap and dryer in the ozone sample line.

#### **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 04/15/2021 Technician Eric Hebert CAD150 Site ID Caddo Valley **USGS Map EPA Site Sponsor (agency)** Map Scale Ouachita Baptist University **Operating Group Map Date** AQS# Climatronics **Meteorological Type** 34.1792 Air Pollutant Analyzer Ozone **QAPP** Latitude -93.0989 dry, wet **QAPP** Longitude **Deposition Measurement** woodland - mixed 71 Land Use **QAPP Elevation Meters** 2.3 gently rolling Terrain **QAPP Declination** 12/28/2004 Marginally Conforms to MLM **OAPP Declination Date** (870) 246-0030 34.179305 **Site Telephone Audit Latitude** -93.098699 DeGray Regulating Dam Site Address 1 **Audit Longitude** Route 390 Site Address 2 **Audit Elevation** 76 Clark 1.3 **County Audit Declination** Arkadelphia, AR City, State **Present** Fire Extinguisher 71923 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 **V Backup Operator Security Fence Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail **Shelter Working Room** ✓ **Make** Ekto Model 8810 **Shelter Size** 640 cuft **✓** Notes Some shelter floor tiles are cracked and there is indication of insect damage below the heater. The Shelter Clean floor is continuing to rot under the tiles. **✓** Notes Site OK

From Interstate 30 in Arkadelphia take exit 78 and turn west on route 7. Go south on Lower Dam Pike, route 390,

west. Continue for approximately 1 mile, the site will be on the left just before the dam.

immediately west of the interstate. This road runs parallel to the interstate for approximately 1/2 mile and then turns

**Driving Directions** 

Fic	eld Systems Data Form		F-02058-1500-S3-rev002
Site	CAD150 Technician Eric Hebert		Site Visit Date 04/15/2021
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	<b>✓</b>	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)	<b>✓</b>	N/A
3	Are the tower and sensors plumb?	<b>✓</b>	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	<b>✓</b>	
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)	<b>✓</b>	
6	Is the solar radiation sensor plumb?	<b>✓</b>	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	<b>✓</b>	N/A
8	Is the rain gauge plumb?	<b>✓</b>	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	<b>✓</b>	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	<b>✓</b>	N/A
11	Is it inclined approximately 30 degrees?	<b>✓</b>	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	CAD150 Technician Eric Hebert		Site Visit Date 04/15/2021
1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	<b>✓</b>	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	<b>✓</b>	Temperature only
3	Are the shields for the temperature and RH sensors clean?	<b>✓</b>	
4	Are the aspirated motors working?	<b>✓</b>	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	<b>✓</b>	N/A
6	Is the surface wetness sensor grid clean and undamaged?	<b>✓</b>	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	✓	N/A
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	<b>✓</b>	N/A
	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,

### Field Systems Data Form F-02058-1500-S5-rev002 CAD150 Technician Eric Hebert Site Visit Date 04/15/2021 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? **V** 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? **~** 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:

There is a moisture trap and dryer in the ozone sample line.

### Field Systems Data Form F-02058-1500-S6-rev002 Site ID CAD150 Technician Eric Hebert Site Visit Date 04/15/2021 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 Shelter not grounded 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** 11 Tower comments? Sample tower is stable but not grounded. Met tower removed

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

#### Field Systems Data Form F-02058-1500-S7-rev002 CAD150 Technician Eric Hebert Site Visit Date 04/15/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No No N/A Yes **V** Wind speed sensor Data logger П **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 ~ Humidity sensor translator** Surge protector П П **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 **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** Site Ops Manual **✓ V HASP** 2016 **✓ V** Field Ops Manual Oct 2014 **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 **✓** 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 CAD150 Technician Eric Hebert Site Visit Date 04/15/2021 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** Semiannually **Multipoint Calibrations V V** Weekly **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) V** N/A **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** Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests V Manual Precision Level Test ✓ V** Weekly **Analyzer Diagnostics Tests V ✓** Quarterly **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V V** Sample Line Check for Dirt/Water Weekly **~** 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? ✓ Call-in only 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 analyzer sample train filter is replaced and the system is leak tested quarterly.

Fi	Field Systems Data Form					F-02058-1500-S9-rev002			
Site	e ID	CAD150 T	'echni	cian Eric Hebert		Site Visit Dat	e 04/15/2021		
	Site ope	ration procedures							
1	Is the fil	ter pack being changed ev	ery Tı	uesday as scheduled	<b>?</b>	Filter changed mo	rinings		
2	Are the correctly	Site Status Report Forms   y?	being	completed and filed	<b>✓</b>				
3	Are data	a downloads and backups led?	being	performed as		No longer required			
4	4 Are general observations being made and recorded? How?					SSRF			
5	5 Are site supplies on-hand and replenished in a timely fashion?			<b>✓</b>					
6	Are sample flow rates recorded? How?				<b>✓</b>	SSRF, logbook, call-in			
7	Are sam	ples sent to the lab on a re	gular	schedule in a timely	✓				
8		ers protected from contami	natio	n during handling	<b>✓</b>	Clean gloves on and off			
9		site conditions reported re ons manager or staff?	gularl	ly to the field	✓				
QC	Check Po	erformed		Frequency			Compliant		
N	Aulti-poir	nt MFC Calibrations	<b>✓</b>	Semiannually			✓		
F	Flow Syste	em Leak Checks	✓	Weekly		✓			
F	ilter Pac	k Inspection							
F	Flow Rate	<b>Setting Checks</b>	✓	Weekly			✓		
1	Visual Check of Flow Rate Rotometer ✓ Weekly					<b>✓</b>			
I	n-line Fil	ter Inspection/Replacemen	ıt 🗸	Semiannually			✓		
S	Sample Li	ne Check for Dirt/Water	<b>✓</b>	Weekly			✓		
		dditional explanation (pho n-made, that may affect th				y) regarding condi	tions listed above, or a	any other features,	

# **Field Systems Data Form**

## F-02058-1500-S10-rev002

Site ID

CAD150

Technician Eric Hebert

Site Visit Date 04/15/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07029
DAS	Campbell	CR3000	2530	000421
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	09883403-01-4	00462
Flow Rate	Apex	AXMC105LPMDPC	illegible	000599
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LRS4	unknown	07195
Ozone	ThermoElectron Inc	49i A1NAA	1105347328	000724
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200015	000439
Sample Tower	Aluma Tower	A	none	03538
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	9699	04682
Zero air pump	Werther International	C 70/4	000821896	06937

# Site Inventory by Site Visit

Site 1	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
СНС	432-Martii	n Valvur-04/20/2021				
1	4/20/2021	Computer	Hewlett Packard	none	6550 b	CN002532PM
2	4/20/2021	DAS	Environmental Sys Corp	none	8832	A4871K
3	4/20/2021	elevation	Elevation	none	none	none
4	4/20/2021	Infrastructure	Infrastructure	none	none	none
5	4/20/2021	Modem	Sierra wireless	none	GX450	Unknown
6	4/20/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460049
7	4/20/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1152780006
8	4/20/2021	Sample Tower	Aluma Tower	none	FOT-10	Unknown
9	4/20/2021	Shelter Temperature	ARS	none	unknown	none
10	4/20/2021	siting criteria	Siting Criteria	none	none	None
11	4/20/2021	Temperature2meter	Vaisala	none	HMP45C	C1210008
12	4/20/2021	Zero air pump	Werther International	none	P 70/4	000756726

#### **DAS Data Form** 0.28 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg **Environmental Sys** A4871K CHC432 Martin Valvur 04/20/2021 DAS Primary Das Date: 4 /20/2021 **Audit Date** 4 /20/2021 ΗY Parameter DAS Mfg 09:05:43 09:06:00 Das Time: **Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** 110 110 Das Day: **Audit Day** Tfer ID 01322 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0004 0.0008 0.0004 0.0008 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 **Cert Date** CorrCoff Channel Input DVM Output DAS Output InputUnit OutputUnit Difference 8 0.0000 V -0.0004 -0.0004 0.00008 0.1000 0.0998 0.0996 V V -0.0002 8 0.3000 0.2997 0.3001V V 0.0004V V 8 0.5000 0.4997 0.5005 0.0008 V 8 0.7000 V 0.0004 0.6998 0.7002 V V 8 0.9000 0.8995 0.9001 0.0006 8 1.0000 0.9998 1.0004 V V 0.0006

## **Ozone Data Form**

Mfg	S	erial Numbe	er Tag Site		Tec	chnician	Site Visit Date	Paramet	ter	Owner ID
ThermoElec	tron Inc	CM08460049	CHC43	2	Ma	artin Valvur	04/20/2021	Ozone		none
Slope:	0.	99258 <b>Slop</b>	e:	0.00000		Mfg	ThermoElectron	Inc Par	rameter	ozone
Intercept	-0.	23119 Inte	rcept	0.00000		Serial Number	49CPS-70008-3	64 Tfe	er Desc.	Ozone primary stan
CorrCoff:	1.	00000 Cori	rCoff:	0.00000		Tfer ID	01110			
DAS 1:		D	AS 2:			Slope	1.0034	10 Inter	cont	0.02230
A Avg % D	iff: A Ma	x % Dif A	Avg %Diff A	Max %	Dif	Stope			сері	
	)%	0.0%				Cert Date	1/20/202	21 Corr	Coff	1.00000
UseDescri	iption (	ConcGroup	Tfer Raw	Tfe	r Corr	Site	Site Unit	RelPerI	Dif	AbsDif
primar	ry	1	-0.06	-(	0.08	-0.25	ppb			-0.17
primar	r <b>y</b>	2	16.34	10	6.17	15.63	ppb			-0.54
primar	ry	3	36.55	36	6.21	35.78	ppb		-1.19	
primar	ry	4	65.06	64	4.48	63.90	ppb		-0.9	
primar	ry	5	111.30	11	0.32	109.20	ppb		-1.02	
-	•	Audit Pressi	·			605.2 mmHg		Status		
Sensor Co	omponen	26.6 degree	unobstructed ru	ıle (	Conditio	<b>on</b> True		Status	pass	
Sensor Co	omponen	Tree dewline	e >10m or below	/ inlet	Conditio	True		Status	pass	
Sensor Co	omponen	ADT <100 v	ehicles further the	nan 20	Conditio	7rue		Status	pass	
Sensor Co	omponen	ADT >100 v	ehicles further the	nan 50	Conditio	on True		Status	pass	
Sensor Co	omponen	Sample Trai	in		Conditio	Good		Status	pass	
Sensor Co	omponen	Inlet Filter C	Condition	<u> </u>	Conditio	On Clean		Status	pass	
Sensor Co	omponen	Offset			Conditio	on 0.50		Status	pass	
Sensor Co	omponen	Span			Conditio	0.999		Status	pass	
Sensor Co	omponen	Zero Voltag	e		Conditio	n N/A		Status	pass	
Sensor Co	omponen	Fullscale Vo	oltage		Conditio	n N/A		Status	pass	
Sensor Co	omponen	Cell A Freq.			Conditio	93.9 kHz		Status	pass	
Sensor Co	omponen	Cell A Noise	)		Conditio	0.8 ppb		Status	pass	
Sensor Co	omponen	Cell A Flow			Conditio	0.63 lpm		Status	pass	
Sensor Co	omponen	Cell A Press	sure		Conditio	589.8 mmHg		Status	pass	
Sensor Co	omponen	Cell A Tmp.			Conditio	27.9 C		Status	pass	
Sensor Co	omponen	Cell B Freq.			Conditio	128.7 kHz		Status	pass	
Sensor Co	omponen	Cell B Noise	)		Conditio	0.9 ppb		Status	pass	
Sensor Co	omponen	Cell B Flow			Conditio	0.63 lpm		Status	pass	
Sensor Co	omponen	Cell B Press	sure		Conditio	589.5 mmHg		Status	pass	
Sensor Co	omponen	System Mer	mo		Conditio	on		Status	pass	

#### 2 Meter Temperature Data Form Calc. Difference Serial Number Tag Site **Technician** Site Visit Date Parameter Mfg **Owner ID** CHC432 Martin Valvur 04/20/2021 Vaisala C1210008 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** 0.25 0.34 UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Difference Test type Temp Mid Range 19.10 19.11 0.0000 19.45 C 0.34 primary 23.69 0.0000 23.61 C -0.08 primary Temp Mid Range 23.68 Temp Mid Range primary 25.45 25.46 0.0000 25.79 C 0.33 Sensor Component Shield **Condition** Clean Status pass Sensor Component Properly Sited **Condition** Properly sited Status pass Sensor Component Blower **Condition** Functioning Status pass Sensor Component System Memo **Condition** See comments Status pass

#### **Shelter Temperature Data For** Mfg Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** ARS Martin Valvur 04/20/2021 none CHC432 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** 0.24 0.33 01229 Tfer ID -0.00824 **Slope** 0.99975 Intercept 2/9/2021 1.00000 **Cert Date** CorrCoff UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Mid Range 21.58 21.59 0.00021.4 $\mathbf{C}$ -0.15 22.2 C -0.23 Temp Mid Range 22.41 22.42 0.000primary

0.000

23.3

C

Status pass

0.33

22.94

Condition

22.93

primary

Temp Mid Range

Sensor Component System Memo

# **Siting Criteria Form**

<b>Sensor Component</b>	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	CHC432	Technician	Martin Valvur	Site Visit Date	04/20/2021
---------	--------	------------	---------------	-----------------	------------

	Size
Ekto 8812 768 cuf	t

<b>Sensor Component</b>	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	N/A	Status	pass
Sensor Component	Moisture Trap Type	Condition	N/A	Status	pass
Sensor Component	Power Cables	Condition	Glass bottle	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	N/A	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	N/A	Status	pass
Sensor Component	Sample Train	Condition	N/A	Status	pass
<b>Sensor Component</b>	System Memo	Condition		Status	pass

### **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard P	roblem		
Temperature2meter	CHC432	Martin Valvur	04/20/2021	System Memo	Vaisala	4644		]		
Temperature and relativ	Temperature and relative humidity are being measured using a combination sensor which cannot be submerged in a water bath for audits.									

# **Field Systems Comments**

1 Parameter: SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

Field Systems Da	nta Form	]	F-02058-1500-S1-rev002
Site ID CHC432	Technician Martin Valvur	Site Visit Date 04/2	0/2021
Site Sponsor (agency)	NPS	USGS Map	
Operating Group	NPS	Map Scale	
AQS#	35-045-0020	Map Date	
	R.M. Young	<b>T</b>	
Meteorological Type		OADDI (% I	
Air Pollutant Analyzer	Ozone	QAPP Latitude	
<b>Deposition Measurement</b>		QAPP Longitude	
Land Use		<b>QAPP Elevation Meters</b>	
Terrain		<b>QAPP Declination</b>	
Conforms to MLM		<b>QAPP Declination Date</b>	
Site Telephone		Audit Latitude	36.034484
Site Address 1		Audit Longitude	-107.904275
Site Address 2		<b>Audit Elevation</b>	1964
County	San Juan	<b>Audit Declination</b>	9.13
City, State	Nageezi, NM	Present	
Zip Code	87037	Fire Extinguisher	Not present
Time Zone	Mountain	First Aid Kit	Not present
<b>Primary Operator</b>		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat	Not present
Primary Op. E-mail		Climbing Belt	
<b>Backup Operator</b>		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Steps	
Shelter Working Room $\checkmark$	Make Ekto Me	odel 8812	Shelter Size 768 cuft
Shelter Clean	Notes		
Site OK	Notes		
park e	highway 550 take county road 7950 (dirt rentrance look for a gate on the north side of dirt road to the top of the mesa.		

			1		1			٦
Site	e ID	CHC432	Technician Martin Valvur		Site Visit Date	04/20/2021		
1		nd speed and direction offuenced by obstruction	sensors sited so as to avoid ons?	<b>✓</b>				
2	(i.e. win	nd sensors should be m	as to minimize tower effects? counted atop the tower or on a 2x the max diameter of the l)	✓				
3	Are the	tower and sensors plu	mb?	<b>✓</b>				
4			oointed north or positioned to uch as buildings, walls, etc?	<b>✓</b>				
5	condition surface	ons? (i.e. ground below	sors sited to avoid unnatural v sensors should be natural l. Ridges, hollows, and areas of ided)	<b>✓</b>				
6	Is the so	olar radiation sensor p	lumb?	<b>✓</b>				
7	Is it site	ed to avoid shading, or	any artificial or reflected light?	<b>✓</b>				
8	Is the ra	ain gauge plumb?		<b>✓</b>				
9	Is it site towers,		effects from buildings, trees,	<b>✓</b>				
10	Is the su facing r		sited with the grid surface	<b>✓</b>	N/A			
11	Is it inc	clined approximately 3	60 degrees?	<b>✓</b>	N/A			
Pro	wide anv	z additional explanatio	n (photograph or sketch if neces	CON	) regarding condi	tions listed a	hove or	any other features

Fi	eld Systems Data Form	F-02058-1500-S4-rev002
Sit	CHC432 Technician Martin Valvur	Site Visit Date 04/20/2021
1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	i 🗸
2	Are all the meteorological sensors operational online, and reporting data?	
3	Are the shields for the temperature and RH sensors clean?	
4	Are the aspirated motors working?	
5	Is the solar radiation sensor's lens clean and free of scratches?	
6	Is the surface wetness sensor grid clean and undamaged?	✓ 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 neces ral or man-made, that may affect the monitoring parameters:	essary) regarding conditions listed above, or any other features, s:

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	CHC432 Technician Martin Valvur		Site Visit Date 04/20/2021
	Siting Criteria: Are the pollutant analyzers and deposition eq	<u>uipı</u>	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?	<b>✓</b>	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	<b>✓</b>	
	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.		N/A
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	<b>✓</b>	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	<b>✓</b>	
7	Is the zero air supply desiccant unsaturated?	<b>✓</b>	
8	Are there moisture traps in the sample lines?		Not present
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	N/A
D.			
	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 CHC432 Technician Martin Valvur Site Visit Date 04/20/2021 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) **✓** 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? 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 CHC432 Technician | Martin Valvur Site Visit Date 04/20/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? Yes No N/A No N/A Yes Wind speed sensor Data logger П **V** $\checkmark$ П Wind direction sensor Data logger **V** $\checkmark$ П **Temperature sensor** Strip chart recorder **✓ V** П Relative humidity sensor Computer **V** П ✓ Solar radiation sensor Modem П П **V V Printer** Surface wetness sensor **V V** Wind sensor translator Zero air pump Filter flow pump **V** Temperature translator **V V V Humidity sensor translator** Surge protector П **V V UPS Solar radiation translator** $\checkmark$ **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** Dataview **SSRF V ✓** N/A **✓ V** Site Ops Manual Electronic copy **V HASP ✓** Electronic copy **✓** Field Ops Manual **V** Electronic copy **Calibration Reports ✓** Electronic copy Ozone z/s/p Control Charts **V** Electronic copy Preventive maintenance schedule **V V** Electronic copy 1 Is the station log properly completed during every site visit? ✓ N/A **V** Are the Site Status Report Forms being completed and current? Are the chain-of-custody forms properly used to document **✓** N/A sample transfer to and from lab? Electronic copy 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 CHC432 Technician | Martin Valvur Site Visit Date 04/20/2021 Site ID Site operation procedures N/A Has the site operator attended a formal CASTNET training ✓ course? If yes, when and who instructed? Has the backup operator attended a formal CASTNET N/A ~ training course? If yes, when and who instructed? Is the site visited regularly on the required Tuesday everyother Tuesday schedule? **✓** Are the standard CASTNET operational procedures being N/A 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** Every 2 weeks **Visual Inspections** ~ **✓** Translator Zero/Span Tests (climatronics) N/A **✓ V** Monthly **Manual Rain Gauge Test V V** Every 2 weeks **Confirm Reasonableness of Current Values V V** N/A **Test Surface Wetness Response** Are regular operational QA/QC checks performed on the ozone analyzer? **QC Check Performed** Frequency Compliant **Multi-point Calibrations ✓ V** Semiannually

Automatic Zero/Span Tests	<b>✓</b> Daily		
Manual Zero/Span Tests	✓ Every 2 we	eks	<b>✓</b>
<b>Automatic Precision Level Tests</b>	<b>✓</b> Daily		<b>✓</b>
<b>Manual Precision Level Test</b>	□ Not perform	ned	✓
<b>Analyzer Diagnostics Tests</b>	✓ Alarm value	es only	✓
In-line Filter Replacement (at inlet)	✓ Every 2 we	eks	✓
In-line Filter Replacement (at analyze	✓ N/A		
Sample Line Check for Dirt/Water	✓ Every 2 we	eks	✓
Zero Air Desiccant Check	✓ Every 2 we	eks	
1 Do multi-point calibration gases go throws sample train including all filters?	ugh the complete	Unknown	
2 Do automatic and manual z/s/p gasses go	through the	<b>✓</b>	
complete sample train including all filter	0		
3 Are the automatic and manual z/s/p check reported? If yes, how?		✓ Electronic copy	

Provide any additional explanation (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	00-S9-rev002	
Site ID CHC432 Tec	ite ID CHC432 Technician Martin Valvur					
Site operation procedures						
1 Is the filter pack being changed every	y Tuesday as scheduled?		/A			
2 Are the Site Status Report Forms be correctly?						
3 Are data downloads and backups be scheduled?	ing performed as	<b>V</b>	/A			
4 Are general observations being made	e and recorded? How?	<b>V</b>	/A			
5 Are site supplies on-hand and replen fashion?						
6 Are sample flow rates recorded? How	Are sample flow rates recorded? How?			N/A		
7 Are samples sent to the lab on a regularishion?	ılar schedule in a timely	<b>✓</b> N	/A			
8 Are filters protected from contamina and shipping? How?	ntion during handling	<b>V</b>	//A			
9 Are the site conditions reported regular operations manager or staff?	larly to the field					
QC Check Performed	Frequency			Compliant		
Multi-point MFC Calibrations	✓ N/A			<b>✓</b>		
Flow System Leak Checks	✓ N/A			✓		
Filter Pack Inspection	✓ N/A			✓		
Flow Rate Setting Checks				<b>✓</b>		
Visual Check of Flow Rate Rotometer				✓		
In-line Filter Inspection/Replacement				<b>✓</b>		
Sample Line Check for Dirt/Water	✓ N/A			<b>✓</b>		
Provide any additional explanation (photo natural or man-made, that may affect the		sary)	regarding condition	ons listed above, or any	y other features,	

Dry deposition samples are not collected at this CASTNET site.

## **Field Systems Data Form**

### F-02058-1500-S10-rev002

Site ID CHC432 Technician Martin Valvur Site Visit Date 04/20/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6550 b	CN002532PM	none
DAS	Environmental Sys Corp	8832	A4871K	none
elevation	Elevation	none	none	none
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	GX450	Unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460049	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1152780006	none
Sample Tower	Aluma Tower	FOT-10	Unknown	none
Shelter Temperature	ARS	unknown	none	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Vaisala	HMP45C	C1210008	none
Zero air pump	Werther International	P 70/4	000756726	none

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
СНЕ	E185-Eric H	lebert-04/21/2021				
1	4/21/2021	DAS	Environmental Sys Corp	70865	8832	illegible
2	4/21/2021	Elevation	Elevation	None	1	None
3	4/21/2021	Filter pack flow pump	Thomas	00498	107CAB18	0000110
4	4/21/2021	Flow Rate	Apex	000884	AXMC105LPMDPCV	illegible
5	4/21/2021	Infrastructure	Infrastructure	none	none	none
6	4/21/2021	Met tower	Universal Tower	03662	unknown	none
7	4/21/2021	Modem	US Robotics	05624	unknown	unknown
8	4/21/2021	Modem	Raven	06984	H4222-C	0808685382
9	4/21/2021	Ozone	Ecotech	87161	EC9810B	10-0064
10	4/21/2021	Sample Tower	Aluma Tower	000054	В	AT-81213-T12
11	4/21/2021	Shelter Temperature	unknown	none	none	015
12	4/21/2021	Shield (10 meter)	RM Young	04620	Aspirated 43408	none
13	4/21/2021	Siting Criteria	Siting Criteria	None	1	None
14	4/21/2021	Temperature	RM Young	06304	41342VO	12543
15	4/21/2021	Zero air pump	Ecotech	none	8301LC	01-0658



#### Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter 04/21/2021 000884 Apex illegible CHE185 Eric Hebert 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** -0.004 **DAS 2: DAS 1:** Cal Factor Zero 4.934 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 1.77% 1.84% 1.5 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. 0.0000primary pump off 0.000 0.0000.00 0.001/ml/m leak check 0.000 0.000 0.02 0.00000.02 1/ml/mprimary 1.52 0.0000 1.49 1/m 1.63% test pt 1 1.501 1.470 1/mprimary 1.470 1.52 0.0000 1.50 1/m1/m1.84% primary test pt 2 1.500 0.00001/m1.84% test pt 3 1.502 1.470 1.52 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 Status pass Condition 1.0 cm

Condition 90 deg

Condition

**Sensor Component** Filter Azimuth

Sensor Component System Memo

Status pass

Status pass

### **Ozone Data Form**

Sologic   1,00097   Slope:   0,00000   Intercept   0,00000   CorrCoff:   0,09999   CorrCoff:   0,00000   CorrCoff:   0,000000   CorrCoff:   0,00000   CorrCoff:   0,000000   CorrCoff:   0,000000   CorrCoff:   0,000000   CorrCoff:   0,000000   CorrCoff:   0,000000   CorrCoff:   0,0000000   CorrCoff:   0,00000000   CorrCoff:   0,000000000   CorrCoff:   0,0000000000000000000000000000000000	Mfg	Serial Number	er Tag Site		Te	chnician	Site Visit Date	Parame	eter	Owner ID
CorrCoff:   0.02094   Intercept   0.00000   CorrCoff:   0.09999   CorrCoff:   0.00000   CorrCoff:   0.000000   CorrCoff:   0.0000000   CorrCoff:   0.00000000   CorrCoff:   0.0000000   CorrCoff:   0.0000000000000000000000000000000000	Ecotech	10-0064	CHE185		Er	ic Hebert	04/21/2021	Ozone		87161
UseDescription   ConceGroup   Ter Raw   Ter Corr   Site   Site Unit   RelPerDif   AbsDif   AbsDif   Description   ConceGroup   Ter Raw   Ter Corr   Site   Site Unit   RelPerDif   AbsDif   AbsDif   Description	Intercept CorrCoff:	0.02064 Inte 0.99999 Corr	rcept C	0.00000		Serial Number Tfer ID	1180930075 01115	Tf	er Desc	Ozone primary stan
UseDescription   ConcGroup   Tifer Raw   Tifer Corr   Site   Site Unit   RelPerDif   AbsDif	A Avg % Diff: A	Max % Dif A	Avg %Diff A	Max % l	Dif	•			•	
primary	0.0%	0.0%				Cert Date	4/7/202	Z1 Corr	·Coff	0.99990
primary 3 36.19 35.38 35.13 ppb -0.71 primary 4 67.40 66.01 66.13 ppb 0.18   Description of the primary 5 109.38 107.21 107.40 ppb 0.18   Description of the primary 5 109.40 ppb 0.18   Description of the primary 5 107.40 ppb 0.18   Description of t		ConcGroup						RelPer	Dif	
primary 4 67.40 66.01 66.13 ppb 0.18 primary 5 109.38 107.21 107.40 ppb 0.18  Sensor Component Audit Pressure Condition Sensor Component Ze6.6 degree unobstructed rule Condition True Status pass Sensor Component Tree dewline >10m or below inlet Condition True Status pass Sensor Component ADT <100 vehicles further than 20 Condition True Status pass Sensor Component ADT >100 vehicles further than 50 Condition True Status pass Sensor Component ADT >100 vehicles further than 50 Condition True Status pass Sensor Component Inlet Filter Condition Condition Good Status pass Sensor Component Offset Condition Clean Status pass Sensor Component Span Condition N/A Status pass Sensor Component Epiliscale Voltage Condition N/A Status pass Sensor Component Cell A Freq. Condition N/A Status pass Sensor Component Cell A Freq. Condition N/A Status pass Sensor Component Cell A Freq. Condition N/A Status pass Sensor Component Cell A Freq. Condition N/A Status pass Sensor Component Cell A Freq. Condition N/A Status pass Sensor Component Cell A Freq. Condition N/A Status pass Sensor Component Cell A Freq. Condition N/A Status pass Sensor Component Cell B Freq. Condition N/A Status pass Sensor Component Cell B Freq. Condition N/A Status pass Sensor Component Cell B Freq. Condition N/A Status pass Sensor Component Cell B Freq. Condition N/A Status pass Sensor Component Cell B Freq. Condition N/A Status pass Sensor Component Cell B Freq. Condition N/A Status pass Sensor Component Cell B Freq. Condition N/A Status pass Sensor Component Cell B Freq. Condition N/A Status pass Sensor Component Cell B Freq. Condition N/A Status pass	primary	2					ppb			0.14
Sensor Component Audit Pressure   Condition   True   Status   pass	-	3					**			
Sensor Component Audit Pressure  Condition   True   Status   pass   Sensor Component   26.6 degree unobstructed rule   Condition   True   Status   pass   Sensor Component   Tree dewline > 10m or below inlet   Condition   True   Status   pass   Sensor Component   ADT < 100 vehicles further than 20   Condition   True   Status   pass   Sensor Component   ADT > 100 vehicles further than 50   Condition   True   Status   pass   Sensor Component   Sample   Train   Condition   Good   Status   pass   Sensor Component   Inlet   Filter Condition   Condition   Clean   Status   pass   Sensor Component   Span   Condition   N/A   Status   pass   Sensor Component   Span   Condition   N/A   Status   pass   Sensor Component   Zero Voltage   Condition   N/A   Status   pass   Sensor Component   Cell   A Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   A Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   A Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   A Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   A Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   A Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   A Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   A Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   B Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   B Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   B Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   B Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   B Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   B Freq.   Condition   N/A   Status   pass   Sensor Component   Cell   B Freq.   Condition   N/A   Status   pass	-						**			
Sensor Component Tree dewline >10m or below inlet Sensor Component Tree dewline >10m or below inlet Sensor Component ADT <100 vehicles further than 20 Sensor Component ADT >100 vehicles further than 50 Sensor Component Sample Train Sensor Component Sample Train Sensor Component Inlet Filter Condition Sensor Component Span Sensor Component Span Condition Sensor Component Span Condition Sensor Component Span Condition Sensor Component Fullscale Voltage Condition Sensor Component Fullscale Voltage Condition Sensor Component Cell A Freq. Condition Sensor Component Cell B Freq. Condition Sensor Component			1	107	.21	107.40	ppb		0.18	
Sensor Component   Tree dewline > 10m or below inlet   Condition   True   Status   pass	Sensor Compone	ent Audit Pressi	ure	C	onditi	on 737.0 mmHg		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 Good Status pass  Sensor Component Inlet Filter Condition Condition Clean Status pass  Sensor Component Offset Condition N/A Status pass  Sensor Component Span Condition N/A 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 N/A Status pass  Sensor Component Cell A Noise Condition N/A Status pass  Sensor Component Cell A Flow Condition N/A Status pass  Sensor Component Cell A Flow Condition N/A Status pass  Sensor Component Cell A Freq. Condition N/A Status pass  Sensor Component Cell A Freq. Condition N/A Status pass  Sensor Component Cell A Freq. Condition N/A Status pass  Sensor Component Cell A Freq. Condition N/A Status pass  Sensor Component Cell A Freq. Condition N/A Status pass  Sensor Component Cell B Freq. Condition N/A Status pass  Sensor Component Cell B Freq. Condition N/A Status pass  Sensor Component Cell B Freq. Condition N/A Status pass  Sensor Component Cell B Freq. Condition N/A Status pass  Sensor Component Cell B Freq. Condition N/A Status pass  Sensor Component Cell B Freq. Condition N/A Status pass	Sensor Compone	ent 26.6 degree	unobstructed ru	le C	onditi	on True		Status	pass	
Sensor Component ADT >100 vehicles further than 50 Condition  Sensor Component Sample Train  Condition Good  Status pass  Sensor Component Inlet Filter Condition  Condition Clean  Status pass  Sensor Component Offset  Condition N/A  Status pass  Sensor Component Span  Condition 0.997  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 N/A  Status pass  Sensor Component Cell A Flow  Condition N/A  Status pass  Sensor Component Cell A Flow  Condition N/A  Status pass  Sensor Component Cell A Freq.  Condition N/A  Status pass  Sensor Component Cell A Flow  Condition N/A  Status pass  Sensor Component Cell A Tmp.  Condition N/A  Status pass  Sensor Component Cell B Freq.  Condition N/A  Status pass  Sensor Component Cell B Freq.  Condition N/A  Status pass  Sensor Component Cell B Noise  Condition N/A  Status pass  Sensor Component Cell B Noise  Condition N/A  Status pass  Sensor Component Cell B Noise  Condition N/A  Status pass  Sensor Component Cell B Flow  Condition N/A  Status pass  Sensor Component Cell B Freq.  Condition N/A  Status pass  Sensor Component Cell B Pressure  Condition N/A  Status pass	Sensor Compone	ent Tree dewline	e >10m or below	inlet C	onditi	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 N/A  Status pass  Sensor Component Span  Condition N/A  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 N/A  Status pass  Sensor Component Cell A Noise  Condition N/A  Status pass  Sensor Component Cell A Flow  Condition 0.50 lpm  Status pass  Sensor Component Cell A Tmp.  Condition 714.6 torr  Status pass  Sensor Component Cell B Freq.  Condition N/A  Status pass  Sensor Component Cell B Freq.  Condition N/A  Status pass  Sensor Component Cell B Freq.  Condition N/A  Status pass  Sensor Component Cell B Freq.  Condition N/A  Status pass  Sensor Component Cell B Freq.  Condition N/A  Status pass  Sensor Component Cell B Pressure  Condition N/A  Status pass  Sensor Component Cell B Pressure  Condition N/A  Status pass  Sensor Component Cell B Pressure  Condition N/A  Status pass  Sensor Component Cell B Pressure  Condition N/A  Status pass	Sensor Compone	ent ADT <100 v	ehicles further th	an 20 C	onditi	on True		Status	pass	
Sensor Component Inlet Filter Condition  Condition Clean  Status pass  Sensor Component Offset  Condition N/A  Sensor Component Span  Condition N/A  Sensor Component Zero Voltage  Condition N/A  Sensor Component Fullscale Voltage  Condition N/A  Sensor Component Cell A Freq.  Condition N/A  Sensor Component Cell A Noise  Condition N/A  Sensor Component Cell A Flow  Condition N/A  Sensor Component Cell A Flow  Condition N/A  Sensor Component Cell A Freq.  Condition N/A  Sensor Component Cell A Flow  Condition N/A  Sensor Component Cell A Freq.  Condition N/A  Sensor Component Cell A Tmp.  Condition N/A  Sensor Component Cell B Freq.  Condition N/A  Sensor Component Cell B Flow  Condition N/A  Sensor	Sensor Compone	ent ADT >100 v	ehicles further th	an 50 C	onditi	on True		Status	pass	
Sensor Component Offset Condition N/A Status pass Sensor Component Span Condition 0.997 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 N/A Status pass Sensor Component Cell A Noise Condition N/A Status pass Sensor Component Cell A Flow Condition N/A Status pass Sensor Component Cell A Flow Condition 0.50 lpm Status pass Sensor Component Cell A Pressure Condition 714.6 torr Status pass Sensor Component Cell B Freq. Condition N/A Status pass Sensor Component Cell B Freq. Condition N/A Status pass Sensor Component Cell B Freq. Condition N/A Status pass Sensor Component Cell B Noise Condition N/A Status pass Sensor Component Cell B Flow Condition N/A Status pass Sensor Component Cell B Flow Condition N/A Status pass	Sensor Compone	ent Sample Trai	in	C	onditi	on Good		Status	pass	
Sensor Component       Span       Condition       0.997       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       N/A       Status       pass         Sensor Component       Cell A Flow       Condition       0.50 lpm       Status       pass         Sensor Component       Cell A Flow       Condition       714.6 torr       Status       pass         Sensor Component       Cell A Tmp.       Condition       32.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       N/A       Status       pass         Sensor Component       Cell B Noise       Condition       N/A       Status       pass         Sensor Component       Cell B Flow       Condition       N/A       Status       pass         Sensor Component       Cell B Pressure       Condition       N/A       Status       pass	Sensor Compone	ent Inlet Filter C	ondition	C	onditi	on Clean		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       N/A       Status       pass         Sensor Component       Cell A Flow       Condition       0.50 lpm       Status       pass         Sensor Component       Cell A Freessure       Condition       714.6 torr       Status       pass         Sensor Component       Cell A Tmp.       Condition       32.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       N/A       Status       pass         Sensor Component       Cell B Noise       Condition       N/A       Status       pass         Sensor Component       Cell B Flow       Condition       N/A       Status       pass         Sensor Component       Cell B Pressure       Condition       N/A       Status       pass	Sensor Compone	ent Offset		C	onditi	on N/A		Status	pass	
Sensor Component       Fullscale Voltage       Condition       N/A       Status       pass         Sensor Component       Cell A Freq.       Condition       N/A       Status       pass         Sensor Component       Cell A Noise       Condition       N/A       Status       pass         Sensor Component       Cell A Flow       Condition       714.6 torr       Status       pass         Sensor Component       Cell A Tmp.       Condition       32.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       N/A       Status       pass         Sensor Component       Cell B Noise       Condition       N/A       Status       pass         Sensor Component       Cell B Flow       Condition       N/A       Status       pass         Sensor Component       Cell B Pressure       Condition       N/A       Status       pass	Sensor Compone	ent Span		C	onditi	on 0.997		Status	pass	
Sensor Component       Cell A Freq.       Condition       N/A       Status       pass         Sensor Component       Cell A Flow       Condition       0.50 lpm       Status       pass         Sensor Component       Cell A Pressure       Condition       714.6 torr       Status       pass         Sensor Component       Cell A Tmp.       Condition       32.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       N/A       Status       pass         Sensor Component       Cell B Noise       Condition       N/A       Status       pass         Sensor Component       Cell B Flow       Condition       N/A       Status       pass         Sensor Component       Cell B Pressure       Condition       N/A       Status       pass	Sensor Compone	ent Zero Voltag	е	C	onditi	on N/A		Status	pass	
Sensor Component       Cell A Noise       Condition       N/A       Status       pass         Sensor Component       Cell A Flow       Condition       0.50 lpm       Status       pass         Sensor Component       Cell A Pressure       Condition       714.6 torr       Status       pass         Sensor Component       Cell A Tmp.       Condition       32.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       N/A       Status       pass         Sensor Component       Cell B Noise       Condition       N/A       Status       pass         Sensor Component       Cell B Flow       Condition       N/A       Status       pass         Sensor Component       Cell B Pressure       Condition       N/A       Status       pass	Sensor Compone	ent Fullscale Vo	ltage	C	onditi	on N/A		Status	pass	
Sensor Component       Cell A Flow       Condition       0.50 lpm       Status       pass         Sensor Component       Cell A Pressure       Condition       714.6 torr       Status       pass         Sensor Component       Cell A Tmp.       Condition       32.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       N/A       Status       pass         Sensor Component       Cell B Noise       Condition       N/A       Status       pass         Sensor Component       Cell B Flow       Condition       N/A       Status       pass         Sensor Component       Cell B Pressure       Condition       N/A       Status       pass	Sensor Compone	ent Cell A Freq.		C	onditi	on N/A		Status	pass	
Sensor Component       Cell A Pressure       Condition       714.6 torr       Status       pass         Sensor Component       Cell A Tmp.       Condition       32.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       N/A       Status       pass         Sensor Component       Cell B Noise       Condition       N/A       Status       pass         Sensor Component       Cell B Flow       Condition       N/A       Status       pass         Sensor Component       Cell B Pressure       Condition       N/A       Status       pass	Sensor Compone	ent Cell A Noise	)	C	onditi	on N/A		Status	pass	
Sensor Component       Cell A Tmp.       Condition       32.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       N/A       Status       pass         Sensor Component       Cell B Noise       Condition       N/A       Status       pass         Sensor Component       Cell B Flow       Condition       N/A       Status       pass         Sensor Component       Cell B Pressure       Condition       N/A       Status       pass	Sensor Compone	ent Cell A Flow		C	onditi	<b>on</b> 0.50 lpm		Status	pass	
Sensor Component       Cell B Freq.       Condition       N/A       Status       pass         Sensor Component       Cell B Noise       Condition       N/A       Status       pass         Sensor Component       Cell B Flow       Condition       N/A       Status       pass         Sensor Component       Cell B Pressure       Condition       N/A       Status       pass	Sensor Compone	ent Cell A Press	sure	C	onditi	<b>714.6</b> torr		Status	pass	
Sensor Component       Cell B Noise       Condition       N/A       Status       pass         Sensor Component       Cell B Flow       Condition       N/A       Status       pass         Sensor Component       Cell B Pressure       Condition       N/A       Status       pass	Sensor Compone	ent Cell A Tmp.		C	onditi	on 32.7 C		Status	pass	
Sensor Component       Cell B Flow       Condition       N/A       Status       pass         Sensor Component       Cell B Pressure       Condition       N/A       Status       pass	Sensor Compone	ent Cell B Freq.		C	onditi	on N/A		Status	pass	
Sensor Component Cell B Pressure Condition N/A Status pass	Sensor Compone	ent Cell B Noise	)	C	onditi	on N/A		Status	pass	
	Sensor Compone	ent Cell B Flow		C	onditi	on N/A		Status	pass	
Sensor Component System Memo Condition Status pass	Sensor Compone	ent Cell B Press	sure	C	onditi	on N/A		Status	pass	
	Sensor Compone	ent System Mer	no	C	onditi	on		Status	pass	

#### **Temperature Data Form** Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg RM Young 12543 CHE185 Eric Hebert 04/21/2021 Temperature 06304 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 0.29 0.47 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.21 0.05 0.00000.5 C 0.47 27.3 C Temp Mid Range 27.75 27.38 0.0000-0.08 primary 46.92 0.0000C primary Temp High Range 46.41 46.7 0.31 Condition Moderately clean Status pass Sensor Component Shield **Condition** Functioning 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** 015 04/21/2021 CHE185 Eric Hebert Shelter Temperature none unknown **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** 1.65 1.73 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 23.20 22.87 0.00024.4 $\mathbf{C}$ 1.57 C Temp Mid Range 22.11 21.78 0.00023.5 1.73 primary Sensor Component System Memo Condition Status pass

## **Siting Criteria Form**

<b>Sensor Component</b>	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 CHE185 Eric Hebert Site Visit Date 04/21/2021

Shelter Make	Shelter Model	Shelter Size	
Shelter One	8128	768 cuft	

<b>Sensor Component</b>	Sample Tower Type	Condition	Туре В	Status	pass
<b>Sensor Component</b>	Conduit	Condition	Good	Status	pass
<b>Sensor Component</b>	Met Tower	Condition	Good	Status	pass
<b>Sensor Component</b>	Moisture Trap	Condition	Installed	Status	pass
<b>Sensor Component</b>	Moisture Trap Type	Condition	Glass bottle and filter	Status	pass
<b>Sensor Component</b>	Power Cables	Condition	Good	Status	pass
<b>Sensor Component</b>	Shelter Temp Control	Condition	Functioning	Status	pass
<b>Sensor Component</b>	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
<b>Sensor Component</b>	Shelter Condition	Condition	Good	Status	pass
<b>Sensor Component</b>	Shelter Door	Condition	Good	Status	pass
<b>Sensor Component</b>	Shelter Roof	Condition	Good	Status	pass
<b>Sensor Component</b>	Shelter Floor	Condition	Good	Status	pass
<b>Sensor Component</b>	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
<b>Sensor Component</b>	Sample Train	Condition	Good	Status	pass
<b>Sensor Component</b>	System Memo	Condition		Status	pass

## **Field Systems Comments**

1 Parameter: SiteOpsProcComm

The site is well maintained and operated. Very good sample change out procedures are being used by the site operator.

2 Parameter: SitingCriteriaCom

The site is located in a pasture with grazing cattle sometimes as close as 5 meters.

3 Parameter: ShelterCleanNotes

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

#### **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 04/21/2021 Technician Eric Hebert CHE185 Site ID Stilwell West **USGS Map EPA** Site Sponsor (agency) Map Scale Cherokee Nation OES **Operating Group Map Date** AQS# R.M. Young **Meteorological Type** 35.7507 Air Pollutant Analyzer Ozone, NOy, ammonia **QAPP** Latitude -94.6700 dry, Hg, passive ammonia **QAPP** Longitude **Deposition Measurement** 299 **Land Use** agriculture, pasture **QAPP Elevation Meters** 3.25 Terrain rolling **QAPP Declination** 9/16/2005 Marginally Conforms to MLM **OAPP Declination Date** (918) 696-5604 35.750786 **Site Telephone Audit Latitude** Cherry Tree -94.669789 Site Address 1 **Audit Longitude** Dahlonegah School 305 Site Address 2 **Audit Elevation** Adair **County Audit Declination** Stilwell, OK City, State **Present** Fire Extinguisher 74960 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 **V Backup Operator Security Fence V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail Shelter Working Room ✓ Make Shelter One Model 8128 **Shelter Size** 768 cuft **✓** Notes The shelter is in very good condition, clean, neat, and well organized. Shelter Clean **✓** Notes Site OK From interstate 40 take exit 311 and go north on route 59 toward Stilwell. Continue approximately 18 miles. About 5 **Driving Directions**

miles south of Stilwell turn left (west) on an unmarked road. There is a sign for Cherry Tree Baptist Church and Dahlonegah school. Continue to the end of the road at the school. The site is on the right behind the ball fields.

Fi	eld Sys	stems Data Fo	rm	F-02058-1500-S3-rev00				
Site	e ID	CHE185	Technician Eric Hebert		Site Visit Date 04/21/2021			
1		d speed and direction s duenced by obstruction	sensors sited so as to avoid ns?	✓				
2	(i.e. wind	l sensors should be mo	ns to minimize tower effects? counted atop the tower or on a cx the max diameter of the	<b>✓</b>				
3	Are the t	tower and sensors plur	mb?	<b>✓</b>				
4			ointed north or positioned to ch as buildings, walls, etc?	✓				
5	condition surface a	ns? (i.e. ground below	ors sited to avoid unnatural sensors should be natural Ridges, hollows, and areas of led)	<b>✓</b>				
6	Is the sol	lar radiation sensor pl	umb?	<b>✓</b>				
7	Is it sited	l to avoid shading, or a	any artificial or reflected light?	<b>✓</b>				
8	Is the rai	in gauge plumb?		✓				
9	Is it sited towers, e		fects from buildings, trees,	✓	45 degree rule violation			
10	Is the sur facing no		ted with the grid surface	✓				
11	Is it incl	ined 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-rev002				
Site	CHE185 Technician Eric Hebert	Site Visit Date 04/21/2021				
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?	✓ N/A				
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,				

Field Systems Data Form	F-02058-1500-S5-rev002
Site ID CHE185 Technician Eric Hebert	Site Visit Date 04/21/2021
Siting Criteria: Are the pollutant analyzers and deposition ed	quipment 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	d 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?	
Bescribe ozone sample tube.	1/4 teflon by 15 meters
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 and analyzer
Are sample lines clean, free of kinks, moisture, and obstructions?	
7 Is the zero air supply desiccant unsaturated?	
Are there moisture traps in the sample lines?	
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 necess atural or man-made, that may affect the monitoring parameters:	

### Field Systems Data Form F-02058-1500-S6-rev002 Site ID CHE185 Technician Eric Hebert Site Visit Date 04/21/2021 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 CHE185 Technician Eric Hebert Site Visit Date 04/21/2021 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 Temperature sensor** Strip chart recorder **V V** Relative humidity sensor Computer **V** Solar radiation sensor **V** Modem ✓ П **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 П **V V UPS Solar radiation translator ~ V** Tipping bucket rain gauge **Lightning protection device** ~ **✓** 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 V SSRF ✓ V ✓ V** Site Ops Manual Oct 2011 **V HASP** Nov 2011 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? ✓ 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 CHE185 Technician Eric Hebert Site Visit Date 04/21/2021 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** 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** Quarterly **V V Automatic Zero/Span Tests** Daily **V V** Every 2 weeks Manual Zero/Span Tests **V Automatic Precision Level Tests V** Every 2 weeks **Manual Precision Level Test ✓ V Analyzer Diagnostics Tests** Weekly **V** Monthly **In-line Filter Replacement (at inlet) V V** Monthly In-line Filter Replacement (at analyze **V V** Sample Line Check for Dirt/Water Weekly **~ 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? SSRF, Cherokee Nation CNEP data system 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	d Systems Data Form		F-02058-1500-S9-rev002			
Site ID CHE185 Technician Eric Hebert				Site Visit Date	04/21/2021	
<u>Si</u>	ite operation procedures					
1 Is	the filter pack being changed every	y Tuesday as scheduled	? <b>~</b>	Filter changed mori	nings	
	re the Site Status Report Forms bei	ing completed and filed	<b>✓</b>			
3 Are data downloads and backups being performed as scheduled?				No longer required		
4 A	4 Are general observations being made and recorded? How?			SSRF, logbook		
	re site supplies on-hand and replen shion?	ished in a timely	<b>✓</b>			
6 A	6 Are sample flow rates recorded? How?			SSRF, call-in		
	re samples sent to the lab on a regu shion?	lar schedule in a timely	<b>✓</b>			
	re filters protected from contaminand shipping? How?	tion during handling	✓	Clean gloves on an	d off	
	re the site conditions reported regu perations manager or staff?	larly to the field	✓			
QC Ch	neck Performed	Frequency			Compliant	
Mul	lti-point MFC Calibrations	<b>✓</b> Semiannually			✓	
Flov	w System Leak Checks	Weekly			✓	
Filte	er Pack Inspection					
Flov	w Rate Setting Checks	<b>✓</b> Weekly			✓	
Visu	ual Check of Flow Rate Rotometer	<b>✓</b> Weekly			✓	
In-li	In-line Filter Inspection/Replacement As needed				✓	
Sam	ple Line Check for Dirt/Water	✓ Weekly			✓	
	e any additional explanation (photo or man-made, that may affect the			y) regarding conditi	ons listed above, or an	y other features,

The site is well maintained and operated. Very good sample change out procedures are being used by the site operator.

## **Field Systems Data Form**

### F-02058-1500-S10-rev002

Site ID CHE185 Technician Eric Hebert Site Visit Date 04/21/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8832	illegible	70865
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0000110	00498
Flow Rate	Apex	AXMC105LPMDPC	illegible	000884
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	03662
Modem	Raven	H4222-C	0808685382	06984
Modem	US Robotics	unknown	unknown	05624
Ozone	Ecotech	EC9810B	10-0064	87161
Sample Tower	Aluma Tower	В	AT-81213-T12	000054
Shelter Temperature	unknown	none	015	none
Shield (10 meter)	RM Young	Aspirated 43408	none	04620
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	12543	06304
Zero air pump	Ecotech	8301LC	01-0658	none

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ME	7405-Martii	n Valvur-04/21/2021				
1	4/21/2021	Computer	Hewlett Packard	none	8470p	CNU3389GGZ
2	4/21/2021	DAS	Environmental Sys Corp	none	8864	C2597
3	4/21/2021	Elevation	Elevation	None	1	None
4	4/21/2021	Filter pack flow pump	Thomas	none	107CAB18	0814000036788
5	4/21/2021	flow rate	Tylan	none	FC280AV-4S	AW9403013
6	4/21/2021	Infrastructure	Infrastructure	none	none	none
7	4/21/2021	MFC power supply	Tylan	none	RO-32	FP9710002
8	4/21/2021	Modem	Sierra wireless	none	GX450	LA54620331001003
9	4/21/2021	Ozone	ThermoElectron Inc	none	49i A3NCA	120477664
10	4/21/2021	Ozone Standard	ThermoElectron Inc	90604	49C	49C-62014-333
11	4/21/2021	Sample Tower	Aluma Tower	illegible	В	none
12	4/21/2021	Shelter Temperature	ARS	none	none	none
13	4/21/2021	Siting Criteria	Siting Criteria	None	1	None
14	4/21/2021	Temperature2meter	RM Young	none	41342VC	14959
15	4/21/2021	Zero air pump	Werther International	none	C 70/4	000847660

#### **DAS Data Form** 1.43 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Environmental Sys C2597 MEV405 Martin Valvur 04/21/2021 DAS Primary Das Date: 4 /21/2021 **Audit Date** 4 /21/2021 ΗY Parameter DAS Mfg 08:48:34 08:50:00 **Das Time: Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** 111 Das Day: 111 **Audit Day** Tfer ID 01322 **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 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 0.0000 V 16 -0.0003 -0.0002 0.0001 16 0.1000 0.0998 0.0998 V V 0.000016 0.3000 0.2996 0.2997 V V 0.0001V V 16 0.5000 0.4999 0.4999 0.0000V 0.7000 V 0.000016 0.6995 0.6995 V V 16 0.9000 0.8996 0.8995 -0.0001 16 1.0000 0.9993 0.9993 V V 0.0000

#### Flow Data Form **Technician** Mfg Serial Number Tag Site Site Visit Date Parameter **Owner ID** Martin Valvur 04/21/2021 flow rate Tylan AW9403013 MEV405 none Mfg BIOS Parameter Flow Rate Tylan Mfg 148613 Tfer Desc. BIOS 220-H **Serial Number** FP9710002 none **SN/Owner ID** 01421 Tfer ID MFC power supply Parameter: 0.00160 **Slope** 1.00850 Intercept 2/10/2021 0.99999 CorrCoff **Cert Date** 0.06 **DAS 1: DAS 2:** Cal Factor Zero 5.427 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.23% 0.33% 3.7 **Rotometer Reading:** Test type Input l/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignal PctDifference Desc. 0.000primary pump off 0.000-0.100.00000.001/ml/m leak check 0.000 0.000 -0.10 0.00000.00 1/ml/mprimary 2.74 0.0000 2.99 1/m -0.20% test pt 1 3.026 3.000 1/mprimary 3.031 3.000 2.73 0.0000 3.01 1/m0.17% primary test pt 2 1/m0.00001/m-0.33% test pt 3 3.038 3.010 2.74 3.00 1/mprimary Sensor Component Leak Test Condition Status pass Sensor Component Tubing Condition **Condition** Good Status pass Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition Status pass Condition Clean and dry Sensor Component Moisture Present Condition No moisture present Status pass Sensor Component Filter Distance Condition 5.5 cm Status pass

Condition 2.0 cm

**Condition** 10 deg

Condition

**Sensor Component** Filter Depth

**Sensor Component** Filter Azimuth

Sensor Component System Memo

Status pass

Status pass

Status pass

### **Ozone Data Form**

Mfg	Serial Number	er Tag Site		Tec	hnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElectron Inc	120477664	MEV40	5	Ма	rtin Valvur	04/21/2021	Ozone		none
	0.98086 Slop 1.28734 Inte		0.00000		Mfg	ThermoElectron			ozone  Ozone primary stan
			0.00000		Serial Number		04	er Desc	Ozone primary starr
					Tfer ID	01110			
<b>DAS 1:</b>	D.	AS 2:			Slope	1.0034	10 Inter	rcept	0.02230
A Avg % Diff: A N		Avg %Diff A	Max % Dif	f	Cert Date	1/20/202	21 Cori	·Coff	1.00000
0.0%	0.0%						Con	Con	
UseDescription	ConcGroup	Tfer Raw	Tfer Co	rr	Site	Site Unit	RelPer	Dif	AbsDif
primary	1	0.13	0.10		0.19	ppb			0.09
primary	2	16.92	16.75			ppb			-2.88
primary	3	37.24	36.89		34.54	ppb		-6.58	
primary	4	67.83	67.22		64.53	ppb		-4.08	
primary	5	116.35	115.33	3	112.20	ppb		-2.75	
Sensor Compone	Audit Press	ure	Con	ditio	n 588 mmHg		Status	pass	
Sensor Compone	ent 26.6 degree	unobstructed ru	le Con	ditio	n True		Status	pass	
Sensor Compone	Tree dewlin	e >10m or below	inlet Con	ditio	n True		Status	pass	
Sensor Compone	ent ADT <100 v	ehicles further th	nan 20 Con	ditio	n 145		Status	Fail	
Sensor Compone	ent ADT >100 v	ehicles further th	nan 50 Con	ditio	n 250		Status	Fail	
Sensor Compone	ent Sample Tra	in	Con	ditio	Good		Status	pass	
Sensor Compone	Inlet Filter C	Condition	Con	ditio	n Clean		Status	pass	
Sensor Compone	ent Offset		Con	ditio	0.000		Status	pass	
Sensor Compone	ent Span		Con	ditio	n 1.002		Status	pass	
Sensor Compone	ent Zero Voltag	е	Con	ditio	on 0.0001		Status	pass	
Sensor Compone	ent Fullscale Vo	oltage	Con	ditio	n 0.9996		Status	pass	
Sensor Compone	ent Cell A Freq.		Con	ditio	n 88.5 kHz		Status	pass	
Sensor Compone	Cell A Noise	Э	Con	ditio	0.9 ppb		Status	pass	
Sensor Compone	Cell A Flow		Con	ditio	0.63 lpm		Status	pass	
Sensor Compone	Cell A Press	sure	Con	ditio	580.9 mmHg		Status	pass	
Sensor Compone	Cell A Tmp.		Con	ditio	32.9 C		Status	pass	
Sensor Compone	Cell B Freq.		Con	ditio	78.8 kHz		Status	pass	
Sensor Compone	Cell B Noise	9	Con	ditio	0.9 ppb		Status	pass	
Sensor Compone	Cell B Flow		Con	ditio	0.62 lpm		Status	pass	
Sensor Compone	ent Cell B Press	sure	Con	ditio	580.6 mmHg		Status	pass	
Sensor Compone	System Mei	mo	Con	ditio	n		Status	pass	

#### 2 Meter Temperature Data Form Calc. Difference Serial Number Tag Site **Technician** Site Visit Date Parameter Mfg **Owner ID** MEV405 Martin Valvur 04/21/2021 RM Young 14959 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** 1.06 2.03 UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Test type Difference primary Temp Low Rang 0.10 0.11 0.0000-0.07C -0.18 23.57 23.58 0.0000 22.61 C -0.97 primary Temp Mid Range Temp High Rang primary 47.61 47.63 0.0000 45.60 C -2.03 Sensor Component Shield **Condition** Dirty Status Fail 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 Martin Valvur 04/21/2021 none MEV405 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** 1.27 1.51 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 21.09 21.10 0.00022.4 $\mathbf{C}$ 1.31 21.69 C Temp Mid Range 21.70 0.00023.2 1.51 primary C 24.73 24.74 0.000 23.8 -0.99 primary Temp Mid Range Status pass Sensor Component System Memo Condition

## **Siting Criteria Form**

<b>Sensor Component</b>	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		Condition 30 m	Status	Fail

### **Infrastructure Data For**

Sit	e ID	MEV405	Technician	Martin Valvur	Site Visit Date	04/21/2021	
	Shelter Ma	ıke	Shelter Model	Sh	nelter Size		
	Ekto		888	51	2 cuft		

<b>Sensor Component</b>	Sample Tower Type	Condition	Type B	Status pass
Sensor Component	Conduit	Condition	Good	Status pass
Sensor Component	Met Tower	Condition	Good	Status pass
Sensor Component	Moisture Trap	Condition	Installed	Status pass
Sensor Component	Moisture Trap Type	Condition	Filter	Status pass
Sensor Component	Power Cables	Condition	Good	Status pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status pass
Sensor Component	Rotometer	Condition	Installed	Status pass
Sensor Component	Sample Tower	Condition	Good	Status pass
Sensor Component	Shelter Condition	Condition	Good	Status pass
Sensor Component	Shelter Door	Condition	Good	Status pass
Sensor Component	Shelter Roof	Condition	Good	Status pass
Sensor Component	Shelter Floor	Condition	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: SitingCriteriaCom

A large parking lot for park service employees is located approximately 30 meters north of the site.

2 Parameter: ShelterCleanNotes

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

### **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 04/21/2021 MEV405 Technician | Martin Valvur Site ID Moccasin Mesa **USGS Map** NPS/EPA Site Sponsor (agency) Map Scale NPS **Operating Group Map Date** 08-083-0101 AQS# Climatronics **Meteorological Type** Air Pollutant Analyzer Ozone **QAPP** Latitude dry, wet, IMPROVE **QAPP** Longitude **Deposition Measurement Land Use** woodland - evergreen **QAPP Elevation Meters** Terrain complex **QAPP Declination** No Conforms to MLM **OAPP Declination Date** 37.198398 **Site Telephone Audit Latitude** Natural Resources -108.490462 Site Address 1 **Audit Longitude** Mesa Verde National Park Site Address 2 **Audit Elevation** 2170 Montezuma 10.3 **County Audit Declination** Cortez, CO City, State **Present** Fire Extinguisher 81330 No inspection date Zip Code Mountain **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 888 Ekto **Shelter Size** 512 cuft **✓** Notes **Shelter Clean** The shelter is in good condition, clean, and organized. **✓** Notes Site OK

From the main entrance on highway 160, go through the park gate and drive about 35 minutes to mile marker 19.

yards down the road. Continue on the same road to the site.

Just after mile marker 19 turn right on the paved service road. The air quality office is the stone building about 200

**Driving Directions** 

Fic	eld Systems Data Form		F-02058-1500-S3-rev002
Site	MEV405 Technician Martin Valvur		Site Visit Date 04/21/2021
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	<b>✓</b>	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	<b>✓</b>	N/A
3	tower into the prevailing wind) Are the tower and sensors plumb?	<b>✓</b>	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	<b>✓</b>	
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)	<b>✓</b>	
6	Is the solar radiation sensor plumb?	<b>✓</b>	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	<b>✓</b>	N/A
8	Is the rain gauge plumb?	<b>✓</b>	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	<b>✓</b>	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A
11	Is it inclined approximately 30 degrees?	<b>✓</b>	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	MEV405 Technician Martin Valvur	Site Visit Date 04/21/2021
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?	Shields dirty
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?	
	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		
Sit	MEV405 Technician Martin Valvur		Site Visit Date 04/21/2021	
	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?	<b>✓</b>		
2	Are the sample inlets 3 - 15 meters above the ground?	<b>✓</b>		
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	<b>✓</b>		
	Pollutant analyzers and deposition equipment operations and	mai	intenance	
1	Do the analyzers and equipment appear to be in good condition and well maintained?	<b>✓</b>		
2	Are the analyzers and monitors operational, on-line, and reporting data?	<b>✓</b>		
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)	<b>✓</b>	At inlet only	
6	Are sample lines clean, free of kinks, moisture, and obstructions?	<b>✓</b>		
7	Is the zero air supply desiccant unsaturated?	<b>✓</b>		
8	Are there moisture traps in the sample lines?	<b>✓</b>	Flow line only	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	Clean and dry	
	vide any additional explanation (photograph or sketch if necess aral 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 MEV405 Technician Martin Valvur Site Visit Date 04/21/2021 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 MEV405 Technician | Martin Valvur Site Visit Date 04/21/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? Yes No N/A 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 **V ~ UPS Solar radiation translator ~ V** Tipping bucket rain gauge **Lightning protection device** ~ $\checkmark$ **Shelter heater** Ozone analyzer ~ $\checkmark$ 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** Dataview **SSRF ✓ V ✓ V** Site Ops Manual Electronic copy **V HASP ✓** Electronic copy Field Ops Manual **Calibration Reports V ✓** 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? **V** 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 MEV405 Technician Martin Valvur Site Visit Date 04/21/2021 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** Semiannually **Multipoint Calibrations V V** Weekly **Visual Inspections ✓ V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** Every 2 weeks **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? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V V** Semiannually **V Automatic Zero/Span Tests** Daily **V V** Monthly Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests Manual Precision Level Test V V** Weekly **Analyzer Diagnostics Tests ~ V** Monthly **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:

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

reported? If yes, how?

**✓** 

Dataview

Fi	eld Sy	stems Data Form				F-02058-15	00-S9-rev002
Site	e ID	MEV405 Tec	hnician Martin Valvur		Site Visit Date	04/21/2021	
	Site ope	ration procedures					
1	Is the fil	ter pack being changed ever	y Tuesday as scheduled?	<b>✓</b>	Filter changed mori	inings	
2	Are the correctl	Site Status Report Forms be y?	ing completed and filed	<b>✓</b>			
3	Are data downloads and backups being performed as scheduled?				No longer required		
4	Are general observations being made and recorded? How?			<b>✓</b>	SSRF		
5	5 Are site supplies on-hand and replenished in a timely fashion?			<b>✓</b>			
6	Are san	ple flow rates recorded? Ho	w?	<b>✓</b>	SSRF		
7	Are sam	uples sent to the lab on a regu	ılar schedule in a timely	<b>✓</b>			
8		ers protected from contamina oping? How?	ntion during handling	<b>✓</b>	Clean gloves on an	d off	
9		site conditions reported regu ons manager or staff?	llarly to the field				
QC	Check P	erformed	Frequency			Compliant	
N	Multi-poi	nt MFC Calibrations	<b>✓</b> Semiannually			✓	
F	Flow Syst	em Leak Checks	✓ Weekly			✓	
F	Filter Pac	k Inspection	✓ Weekly		✓		
F	Flow Rate	Setting Checks	✓ Weekly		✓		
1	Visual Ch	eck of Flow Rate Rotometer	<b>✓</b> Weekly			<b>✓</b>	
I	n-line Fil	ter Inspection/Replacement	✓ As needed		✓		
S	Sample Li	ne Check for Dirt/Water	Weekly			✓	
		dditional explanation (photo n-made, that may affect the			) regarding condit	ions listed above, or an	y other features,

## **Field Systems Data Form**

### F-02058-1500-S10-rev002

Site ID MEV405 Technician Martin Valvur Site Visit Date 04/21/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8470p	CNU3389GGZ	none
DAS	Environmental Sys Corp	8864	C2597	none
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0814000036788	none
flow rate	Tylan	FC280AV-4S	AW9403013	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9710002	none
Modem	Sierra wireless	GX450	LA54620331001003	none
Ozone	ThermoElectron Inc	49i A3NCA	120477664	none
Ozone Standard	ThermoElectron Inc	49C	49C-62014-333	90604
Sample Tower	Aluma Tower	В	none	illegible
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	14959	none
Zero air pump	Werther International	C 70/4	000847660	none

# Site Inventory by Site Visit

Site Vi	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CVL15	51-Eric H	ebert-05/01/2021				
1	5/1/2021	Computer	Dell	07026	Inspiron 15	2Z2MC12
2	5/1/2021	DAS	Campbell	000417	CR3000	2515
3	5/1/2021	Elevation	Elevation	None	1	None
4	5/1/2021	Filter pack flow pump	Thomas	04282	107CAB18B	129800010140
5	5/1/2021	Flow Rate	Apex	000645	AXMC105LPMDPCV	illegible
6	5/1/2021	Infrastructure	Infrastructure	none	none	none
7	5/1/2021	Modem	Digi	07174	LR54	unknown
8	5/1/2021	Ozone	ThermoElectron Inc	000733	49i A1NAA	1105347322
9	5/1/2021	Ozone Standard	ThermoElectron Inc	000696	49i A3NAA	1030244812
10	5/1/2021	Sample Tower	Aluma Tower	03540	Α	none
11	5/1/2021	Shelter Temperature	Campbell	none	107-L	none
12	5/1/2021	Siting Criteria	Siting Criteria	None	1	None
13	5/1/2021	Temperature	RM Young	04447	41342	4545
14	5/1/2021	Zero air pump	Werther International	06909	C 70/4	000829161

#### **DAS Data Form** 0.03 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Primary Campbell 2515 CVL151 Eric Hebert 05/01/2021 DAS Das Date: 5 /1 /2021 **Audit Date** 5 /1 /2021 Datel Parameter DAS Mfg 11:51:00 Das Time: 11:51:02 **Audit Time** 4000392 Tfer Desc. Source generator (D **Serial Number** 121 Das Day: 121 **Audit Day** Tfer ID 01321 **Low Channel: High Channel: Avg Diff: Avg Diff: Max Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0001 0.0001 0.0001 0.0001 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 0.0000 V 0.0000 0.0000 0.00007 0.1000 0.1000 0.1000 V V 0.00007 0.3000 0.30010.3000 V V -0.0001 V V 7 0.5000 0.5002 0.5001 -0.0001 V 0.7000 V -0.0001 7 0.7002 0.7001 V V 0.9000 0.9003 0.9002 -0.0001 7 1.0000 1.0003 1.0002 V V -0.0001

#### Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter CVL151 05/01/2021 000645 Apex illegible Eric Hebert 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 1 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 1.35% 1.35% 1.5 **Rotometer Reading:** Desc. Test type Input l/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignal PctDifference 1/mprimary pump off 0.000 0.0000.00 0.0000.001/mleak check 0.000 0.01 0.0000.01 1/ml/m0.000 primary 1.49 0.000 1/m 1.35% test pt 1 1.510 1.480 1.50 1/mprimary 1.480 1.50 0.000 1.50 1/m1/m1.35% primary test pt 2 1.512 0.0001/m1.35% test pt 3 1.512 1.480 1.50 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 5.5 cm Status pass Sensor Component Filter Depth Status pass Condition 1.5 cm Status pass **Sensor Component** Filter Azimuth Condition 280 deg Status pass Sensor Component System Memo Condition

### **Ozone Data Form**

Mfg	Serial Number	er Tag Site	,	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347322	CVL151		Eric Hebert	05/01/2021	Ozone	000733
Intercept -		rcept	0.00000 0.00000 0.00000	Mfg Serial Number Tfer ID	ThermoElectron 1180930075 01115		er ozone c. Ozone primary stan
DAS 1: A Avg % Diff: A N 0.0%		AS 2: Avg %Diff A	Max % Dif	Slope Cert Date	1.0056		0.14070
UseDescription	ConcGroup	Tfer Raw	Tfer Cor	r Site	Site Unit	RelPerDif	AbsDif
primary	1	0.48	0.33	0.47	ppb		0.14
primary	2	14.58	14.17	14.15	ppb		-0.02
primary	3	37.63	36.79	36.56	ppb	-0.63	
primary	4	67.84	66.44	66.24	ppb	-0.3	
primary	5	106.05	103.95	104.50	ppb	0.53	
Sensor Compone	Audit Press	ure	Cond	736.3 mmHg		Status pass	
Sensor Compone	26.6 degree	unobstructed ru	le Cond	lition False		Status Fail	
Sensor Compone	ree dewlin	e >10m or below	inlet Cond	lition True		Status pass	
Sensor Compone	ent ADT <100 v	ehicles further th	nan 20 Cond	lition 70		Status Fail	
Sensor Compone	ent ADT >100 v	ehicles further th	nan 50 Cond	lition True		Status pass	
Sensor Compone	ent Sample Tra	in	Cond	lition Good		Status pass	
Sensor Compone	nt Inlet Filter C	Condition	Cond	lition Clean		Status pass	
Sensor Compone	Offset		Cond	lition -0.50		Status pass	
Sensor Compone	Span		Cond	lition 1.025		Status pass	
Sensor Compone	zero Voltag	е	Cond	lition N/A		Status pass	
Sensor Compone	Fullscale Vo	oltage	Cond	lition N/A		Status pass	
Sensor Compone	Cell A Freq.		Cond	lition 86.3 kHz		Status pass	
Sensor Compone	ent Cell A Noise	<b>e</b>	Cond	lition 0.9 ppb		Status pass	
Sensor Compone	Cell A Flow		Cond	lition 0.71 lpm		Status pass	
Sensor Compone	ent Cell A Press	sure	Cond	lition 707.4 mmHg		Status pass	
Sensor Compone	Cell A Tmp.		Cond	lition 36.0 C		Status pass	
Sensor Compone	ent Cell B Freq.		Cond	lition 91.8 kHz		Status pass	
Sensor Compone	ent Cell B Noise	•	Cond	lition 0.6 ppb		Status pass	
Sensor Compone	ent Cell B Flow		Cond	lition 0.70 lpm		Status pass	
Sensor Compone	ent Cell B Press	sure	Cond	lition 708 mmHg		Status pass	
Sensor Compone	System Mer	mo	Cond	lition		Status pass	

### **Temperature Data Form** Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg RM Young 4545 CVL151 Eric Hebert 05/01/2021 Temperature 04447 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 0.13 0.19 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.38 0.22 0.0000.3 $\mathbf{C}$ 0.1 25.2 C Temp Mid Range 25.70 25.35 0.000 -0.19 primary 0.000C primary Temp High Range 47.16 46.65 46.6 -0.1 **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** 05/01/2021 Campbell none CVL151 Eric Hebert 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** 1.06 1.11 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 23.84 23.50 0.00024.6 $\mathbf{C}$ 1.11 C Temp Mid Range 24.75 24.40 0.00025.4 primary 1 Sensor Component System Memo Condition Status pass

## **Siting Criteria Form**

<b>Sensor Component</b>	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 CVL151 Technician Eric Hebert Site Visit Date 05/01/2021	cian Eric Hebert Site Visit Date 05/01/2021
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Shelter Make	Shelter Model	Shelter Size	
Ekto	8810	640 cuft	

<b>Sensor Component</b>	Sample Tower Type	Condition	Type A	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
<b>Sensor Component</b>	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
<b>Sensor Component</b>	Shelter Temp Control	Condition	Functioning	Status	pass
<b>Sensor Component</b>	Rotometer	Condition	Installed	Status	pass
<b>Sensor Component</b>	Sample Tower	Condition	Fair	Status	pass
<b>Sensor Component</b>	Shelter Condition	Condition	Good	Status	pass
<b>Sensor Component</b>	Shelter Door	Condition	Fair	Status	pass
<b>Sensor Component</b>	Shelter Roof	Condition	Good	Status	pass
<b>Sensor Component</b>	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Shelter walls	Condition	Good	Status	pass
<b>Sensor Component</b>	Excessive mold present	Condition	Fair	Status	pass
<b>Sensor Component</b>	Signal Cable	Condition	Good	Status	pass
<b>Sensor Component</b>	Tubing Type	Condition	3/8 teflon	Status	pass
<b>Sensor Component</b>	Sample Train	Condition	Good	Status	pass
<b>Sensor Component</b>	System Memo	Condition		Status	pass

# **Field Systems Comments**

1 Parameter: SitingCriteriaCom

The site is located in a Pine forest on USFS managed land. The tree line has been cut back to at least 17 meters from the site.

2 Parameter: ShelterCleanNotes

The shelter has been repaired since the previous audit visit.

### **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 05/01/2021 CVL151 Technician Eric Hebert Site ID Coker Lake **USGS Map EPA Site Sponsor (agency)** Map Scale Private - USFS **Operating Group Map Date** 28-161-9991 AQS# Climatronics **Meteorological Type** 34.0028 Air Pollutant Analyzer Ozone **QAPP** Latitude -89.7989 dry, wet **QAPP** Longitude **Deposition Measurement** 134 **Land Use** woodland - evergreen **QAPP Elevation Meters** 0.2 Terrain rolling **QAPP Declination** Marginally 2/22/2006 Conforms to MLM **OAPP Declination Date** (662) 623-7334 34.002747 **Site Telephone Audit Latitude** Forest Road 809 -89.799183 Site Address 1 **Audit Longitude** Tombigbee National Forest Site Address 2 **Audit Elevation** 138 Yalobusha -0.95 **County Audit Declination** Tillatoba, MS City, State **Present** Fire Extinguisher 38961 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 Ekto **Shelter Size** 640 cuft **✓** Notes The shelter has been repaired since the previous audit visit. Shelter Clean **✓** Notes Site OK From interstate 55 take exit 220 east on highway 330. Continue approximately 5 miles and turn left (north) at the **Driving Directions**

Forest Service sign for the Yalobusha County Work Center and Jamie L. Whitter Plant Materials Center. Immediately after the facility turn left on forest service road 802. Continue approximately 1.5 miles to the stop sign and turn left on

road 809. Continue approximately 0.3 miles to the first road on the left.

Fi	eld Systems Data Form		F-02058-1500-S3-rev002
Site	CVL151 Technician Eric Hebert		Site Visit Date 05/01/2021
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	<b>✓</b>	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)	<b>✓</b>	N/A
3	Are the tower and sensors plumb?	<b>✓</b>	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	<b>✓</b>	
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)	<b>✓</b>	
6	Is the solar radiation sensor plumb?	<b>✓</b>	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	<b>✓</b>	N/A
8	Is the rain gauge plumb?	<b>✓</b>	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	<b>✓</b>	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	<b>✓</b>	N/A
11	Is it inclined approximately 30 degrees?	<b>V</b>	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	CVL151 Technician Eric Hebert	Site Visit Date 05/01/2021
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,

Fi	eld Systems Data Form	F-02058-1500-S5-rev002	
Site	CVL151 Technician Eric Hebert		Site Visit Date 05/01/2021
	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?		13 meters
	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?	<b>✓</b>	
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?	<b>✓</b>	
8	Are there moisture traps in the sample lines?	<b>✓</b>	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	Clean and dry
Prov natu	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,

### Field Systems Data Form F-02058-1500-S6-rev002 Site ID CVL151 Technician Eric Hebert Site Visit Date 05/01/2021 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?

Is the met tower stable and grounded?

11 Tower comments?

Is the sample tower stable and grounded?

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

Stable

**V** 

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

Grounded

**V** 

#### Field Systems Data Form F-02058-1500-S7-rev002 CVL151 Technician Eric Hebert Site Visit Date 05/01/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No No N/A Yes **V ✓** Wind speed sensor Data logger П **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 ~ Humidity sensor translator Surge protector** П П **V ~ UPS Solar radiation translator ~ V** Tipping bucket rain gauge **Lightning protection device** ~ $\checkmark$ Shelter heater Ozone analyzer ~ **✓** 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 ✓** Site Ops Manual June 2007 **V V HASP** Feb 2014 **✓ V** Field Ops Manual Feb 2014 **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 CVL151 Technician Eric Hebert Site Visit Date 05/01/2021 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 **~** 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 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** 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 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?

	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:

Fi	eld Sy	stems Data Forn	1		F-02058-1500-S9-rev002			
Site	e ID	CVL151 T	echnician Eric Heber	t	Site Visit Da	05/01/2021		
	Site ope	ration procedures						
1	Is the fil	ter pack being changed ev	ery Tuesday as sched	uled? 🔽	Filter changed mo	ornings		
2	Are the correctly	Site Status Report Forms y?	peing completed and	filed 🔽				
3	Are data	a downloads and backups ded?	peing performed as		No longer require	d		
4	Are gen	eral observations being ma	de and recorded? Ho	ow? ✓	SSRF, logbook			
5	Are site fashion?	supplies on-hand and repl	enished in a timely	<b>✓</b>				
6	Are sam	ple flow rates recorded? F	low?	<b>✓</b>	SSRF, call-in			
7	Are sam	ples sent to the lab on a re	gular schedule in a ti	mely 🗸				
8		ers protected from contami	nation during handli	ng 🗸	Clean gloves on a	and off		
9		site conditions reported re ons manager or staff?	gularly to the field	<b>✓</b>				
QC	Check Po	erformed	Frequency			Compliant		
N	Aulti-poir	nt MFC Calibrations	<b>✓</b> Semiannually			✓		
F	Flow Syste	em Leak Checks	<b>✓</b> Weekly			✓		
F	ilter Pac	k Inspection						
F	low Rate	<b>Setting Checks</b>	<b>✓</b> Weekly			✓		
7	isual Ch	eck of Flow Rate Rotometo	weekly Weekly			$\checkmark$		
I	n-line Fil	ter Inspection/Replacemen	t Semiannually			$\checkmark$		
S	Sample Li	ne Check for Dirt/Water	Weekly			✓		
		dditional explanation (pho n-made, that may affect th			y) regarding cond	itions listed above, or	any other features,	

## **Field Systems Data Form**

### F-02058-1500-S10-rev002

Site ID CV

CVL151 Technic

Technician Eric Hebert

Site Visit Date 05/01/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	2Z2MC12	07026
DAS	Campbell	CR3000	2515	000417
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	129800010140	04282
Flow Rate	Apex	AXMC105LPMDPC	illegible	000645
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07174
Ozone	ThermoElectron Inc	49i A1NAA	1105347322	000733
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244812	000696
Sample Tower	Aluma Tower	A	none	03540
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4545	04447
Zero air pump	Werther International	C 70/4	000829161	06909

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PND	165-Martii	n Valvur-05/03/2021				
1	5/3/2021	DAS	Campbell	000403	CR3000	2516
2	5/3/2021	Elevation	Elevation	None	1	None
3	5/3/2021	Filter pack flow pump	Thomas	00534	107CA18	0000162757
4	5/3/2021	Flow Rate	Apex	000871	AXMC105LPMDPCV	illegible
5	5/3/2021	Infrastructure	Infrastructure	none	none	none
6	5/3/2021	Modem	Digi	07123	LR54	Illegible
7	5/3/2021	Noy	Teledyne	000795	T200U	101
8	5/3/2021	Ozone	ThermoElectron Inc	000621	49i A1NAA	1009241798
9	5/3/2021	Ozone Standard	ThermoElectron Inc	000435	49i A3NAA	CM08200011
10	5/3/2021	Sample Tower	Aluma Tower	000055	В	AT-81213-J12
11	5/3/2021	Shelter Temperature	Campbell	none	107-L	none
12	5/3/2021	Siting Criteria	Siting Criteria	None	1	None
13	5/3/2021	Temperature	RM Young	06539	41342	14800
14	5/3/2021	Zero air pump	Werther International	06881	C 70/4	000815264

#### **DAS Data Form** 0 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Primary Campbell 2516 PND165 Martin Valvur 05/03/2021 DAS Das Date: 5 /3 /2021 **Audit Date** 5 /3 /2021 ΗY Parameter DAS Mfg 10:25:00 10:25:00 Das Time: **Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** Das Day: 123 **Audit Day** 123 Tfer ID 01322 **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 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 **Cert Date** CorrCoff Channel Input DVM Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V -0.0006 -0.0005 0.0001 7 0.1000 0.0996 0.0997 V V 0.0001 7 0.3000 0.2996 0.2997 V V 0.0001V V 7 0.5000 0.4996 0.4995 -0.0001 V 0.7000 V 0.0001 7 0.6997 0.6998 V V 0.9000 0.8996 0.8997 0.0001 7 1.0000 0.9995 0.9994 V V -0.0001

#### Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter Martin Valvur 05/03/2021 000871 Apex illegible PND165 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** 0.01 **DAS 2: DAS 1:** Cal Factor Zero 1 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 1.32% 1.64% 4 **Rotometer Reading:** Desc. Test type Input l/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignal PctDifference primary pump off 0.000 0.0000.00 0.0000.01 1/m1/m leak check 0.000 0.000 0.01 0.0000.02 1/ml/mprimary 3.01 0.000 1/m -1.32% test pt 1 3.069 3.040 3.00 1/mprimary 3.069 3.040 3.01 0.000 3.01 1/m1/m-0.99% primary test pt 2 3.01 0.0001/m-1.64% test pt 3 3.075 3.050 3.00 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 5.5 cm Status pass Sensor Component Filter Depth Condition 2.0 cm Status pass Status pass **Sensor Component** Filter Azimuth Condition 180 deg Status pass Sensor Component System Memo Condition

### **Ozone Data Form**

Mfg S	erial Numbe	r Tag Site		Tec	hnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElectron Inc 1	1009241798	PND165		Ма	ırtin Valvur	05/03/2021	Ozone		000621
Intercept -0.	99999 Cori	rcept 0. Coff: 0.	00000 00000 00000 Max % Dif		Mfg Serial Number Tfer ID Slope Cert Date	ThermoElectron 49CPS-70008-3 01110 1.003-4 1/20/20	364 Tf 40 Inter		Ozone primary stan  0.02230  1.00000
UseDescription (	ConcGroup	Tfer Raw	Tfer Co	···	Site	Site Unit	RelPer	·D:t	AbsDif
primary	1	0.16	0.13	11	0.12	ppb	Ken ei	ווע	-0.01
primary	2	15.59	15.43		14.87	ppb			-0.56
primary	3	36.14	35.80		35.57	ppb		-0.64	0.50
primary	4	66.17	65.58		65.03	ppb		-0.84	
primary	5	107.82	106.87		106.20	ppb		-0.63	
Sensor Component	Audit Pressu	ıre	Conc	ditio	573.7 mmHg		Status	pass	
Sensor Component	26.6 degree	unobstructed rule	Cone	ditio	True		Status	pass	
Sensor Component	Tree dewline	e >10m or below	nlet Con	ditio	True		Status	pass	
Sensor Component	ADT <100 v	ehicles further tha	an 20 Cond	ditio	n True		Status	pass	
Sensor Component	ADT >100 v	ehicles further tha	an 50 Cond	ditio	230 m		Status	Fail	
Sensor Component	Sample Trai	n	Conc	ditio	Good		Status	pass	
Sensor Component	Inlet Filter C	ondition	Cone	ditio	Not tested		Status	pass	
Sensor Component	Offset		Cone	ditio	on -0.2		Status	pass	
Sensor Component	Span		Con	ditio	n 1.002		Status	pass	
Sensor Component	Zero Voltage	Э	Con	ditio	n N/A		Status	pass	
Sensor Component	Fullscale Vo	ltage	Cone	ditio	n N/A		Status	pass	
Sensor Component	Cell A Freq.		Cone	ditio	96.7 kHz		Status	pass	
Sensor Component	Cell A Noise		Cone	ditio	0.8 ppb		Status	pass	
Sensor Component	Cell A Flow		Conc	ditio	0.61 lpm		Status	pass	
Sensor Component	Cell A Press	sure	Con	ditio	560.6 mmHg		Status	pass	
Sensor Component	Cell A Tmp.		Con	ditio	37.4 C		Status	pass	
Sensor Component	Cell B Freq.		Conc	ditio	83.9 kHz		Status	pass	
Sensor Component	Cell B Noise		Conc	ditio	0.6 ppb		Status	pass	
Sensor Component	Cell B Flow		Cone	ditio	0.62 lpm		Status	pass	
Sensor Component	Cell B Press	sure	Cone	ditio	560.0 mmHg		Status	pass	
Sensor Component	System Men	no	Con	ditio	on		Status	pass	

### **Temperature Data Form** Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg RM Young 14800 PND165 Martin Valvur 05/03/2021 Temperature 06539 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 0.06 0.14 UseDesc. InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference Test type primary Temp Low Range 0.02 0.03 0.0000.1 C 0.04 25.1 C Temp Mid Range 25.07 25.08 0.000 0.01 primary 47.01 0.000 C primary Temp High Range 47.03 47.2 0.14 **Condition** Clean Status pass Sensor Component | Shield **Condition** Not functioning Status Fail **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 PND165 05/03/2021 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** 0.15 0.45 01229 Tfer ID -0.00824 **Slope** 0.99975 Intercept 2/9/2021 1.00000 **Cert Date** CorrCoff UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Mid Range 23.67 23.68 0.00024.1 $\mathbf{C}$ 0.45

0.000

0.000

23.66

25.20

Condition

Temp Mid Range

Temp Mid Range

Sensor Component System Memo

primary

primary

23.65

25.19

C

C

Status pass

0

0

23.7

25.2

## **Siting Criteria Form**

<b>Sensor Component</b>	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 PND165 Technician Martin Valvur Site Visit Date 05/03/2021

Shelter Make	Shelter Model	Shelter Size	
Ekto	8810 (s/n 2149-22)	640 cuft	

<b>Sensor Component</b>	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	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
<b>Sensor Component</b>	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
<b>Sensor Component</b>	Shelter Roof	Condition	Good	Status	pass
<b>Sensor Component</b>	Shelter Floor	Condition	Fair	Status	pass
<b>Sensor Component</b>	Shelter walls	Condition	Fair	Status	pass
<b>Sensor Component</b>	Excessive mold present	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
<b>Sensor Component</b>	Tubing Type	Condition	3/8 teflon	Status	pass
<b>Sensor Component</b>	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	d Problem	
Temperature	PND165	Martin Valvur	05/03/2021	Blower	RM Young	2851			
The forced-air blower for the shield is not functioning.									

# **Field Systems Comments**

1 Parameter: SitingCriteriaCom

Construction at the bottom of the hill and entrance to the site access road has been completed.

2 Parameter: ShelterCleanNotes

The shelter is well maintained.

### **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 05/03/2021 PND165 Technician | Martin Valvur Site ID Fremont Lake South **USGS Map EPA** Site Sponsor (agency) Map Scale Private / BLM **Operating Group Map Date** 56-035-9991 AQS# R.M. Young **Meteorological Type** 42.9214 Air Pollutant Analyzer Ozone **QAPP** Latitude -109.7900 dry, wet **QAPP** Longitude **Deposition Measurement** 2388 **Land Use** range **QAPP Elevation Meters** 12.75 Terrain complex **QAPP Declination** Marginally 2/22/2006 Conforms to MLM **OAPP Declination Date** (307) 367-6584 42.929031 **Site Telephone Audit Latitude** Skyline Drive -109.787796 Site Address 1 **Audit Longitude** Fremont Lake Rd. Site Address 2 **Audit Elevation** 2386 Sublette 10.9 **County Audit Declination** Pinedale, WY City, State **Present** Fire Extinguisher 82941 New in 2015 Zip Code Mountain **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 2149-22) Ekto **Shelter Size** 640 cuft **✓** Notes The shelter is well maintained. Shelter Clean **✓** Notes Site OK

From Rock Springs take route 191 north to Pinedale. At the south edge of town turn right onto Fremont Lake Rd.

is visible on a ridge on the right. There is a dirt access road to the site in the summer.

Continue approximately 6.5 miles on the main road, past Fremont Lake. The road changes to Skyline Drive. The site

**Driving Directions** 

### **Field Systems Data Form** F-02058-1500-S3-rev002 Site Visit Date 05/03/2021 Technician Martin Valvur Site ID PND165 ✓ 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? Over shelter Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc? ✓ Over shelter 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?

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

10 Is the surface wetness sensor sited with the grid surface

11 Is it inclined approximately 30 degrees?

facing north?

✓ N/A

✓ N/A

Fi	eld Systems Data Form		F-02058-1500-S4-rev002
Sit	PND165 Technician Martin Valvur		Site Visit Date 05/03/2021
1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	<b>✓</b>	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	<b>✓</b>	N/A
3	Are the shields for the temperature and RH sensors clean?	<b>✓</b>	
4	Are the aspirated motors working?		not functioning
5	Is the solar radiation sensor's lens clean and free of scratches?	<b>✓</b>	N/A
6	Is the surface wetness sensor grid clean and undamaged?	<b>✓</b>	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	<b>✓</b>	
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,

Fi	eld Systems Data Form	F-02058-1500-S5-rev002		
Sit	e ID PND165 Technician Martin Valvur		Site Visit Date 05/03/2021	
	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?	<b>✓</b>		
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	<b>✓</b>		
	Pollutant analyzers and deposition equipment operations and	l mai	intenance	
1	Do the analyzers and equipment appear to be in good condition and well maintained?	<b>✓</b>		
2	Are the analyzers and monitors operational, on-line, and reporting data?	<b>✓</b>		
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)	<b>✓</b>	At inlet only	
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓		
7	Is the zero air supply desiccant unsaturated?	<b>✓</b>		
8	Are there moisture traps in the sample lines?	<b>✓</b>		
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	Clean and dry	
	vide any additional explanation (photograph or sketch if necessical 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 PND165 Technician Martin Valvur Site Visit Date 05/03/2021 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** 

Provide any additional 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 Tower comments?

### Field Systems Data Form F-02058-1500-S7-rev002 PND165 Technician | Martin Valvur Site Visit Date 05/03/2021 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 V** П **Temperature sensor** Strip chart recorder **✓ V** Relative humidity sensor Computer **V** Solar radiation sensor **V** Modem П **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** $\checkmark$ 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 SSRF ✓ V ✓ V** Site Ops Manual Feb 2014 **V HASP ✓** Feb 2014 **✓** Field Ops Manual Feb 2014 **V 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 PND165 Technician Martin Valvur Site Visit Date 05/03/2021 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** 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** N/A Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests V** N/A **Manual Precision Level Test V ✓** Every 2 weeks **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,

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

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

reported? If yes, how?

SSRF, call-in

Field Systems Data Form					F-02058-1500-S9-rev002			
Site ID PND165 Technic		Cechnician Martin V	/alvur	Site Visit I	Date 05/03/2021			
	Site ope	ration procedures						
1	Is the fil	ter pack being changed ev	ery Tuesday as scho	eduled? 🔽	Filter changed	afternoons approximately	y 80%	
2	2 Are the Site Status Report Forms being completed and filed correctly?			d filed				
3	Are data downloads and backups being performed as scheduled?			No longer requ	ired			
4	Are general observations being made and recorded? How?			How?	SSRF			
5	5 Are site supplies on-hand and replenished in a timely fashion?			V				
6	Are sample flow rates recorded? How?			•	SSRF, call-in	SSRF, call-in		
7	Are samples sent to the lab on a regular schedule in a timely fashion?			timely -				
8		ers protected from contamoping? How?	ination during hand	dling				
9		site conditions reported rooms manager or staff?	egularly to the field	•				
QC	Check Po	erformed	Frequency			Compliant		
I	Multi-poii	nt MFC Calibrations	Semiannually	,		✓		
]	Flow Syste	em Leak Checks	<b>✓</b> Weekly			✓		
J	Filter Pac	k Inspection						
]	Flow Rate	<b>Setting Checks</b>	✓ Weekly			✓		
•	Visual Check of Flow Rate Rotometer ✓ Weekly					✓		
1	In-line Fil	ter Inspection/Replacemen	ıt ☑ Semiannually	,	✓			
5	Sample Li	ne Check for Dirt/Water	<b>✓</b> Weekly			✓		
		dditional explanation (ph n-made, that may affect t			y) regarding co	nditions listed above, o	r any other features,	

# **Field Systems Data Form**

## F-02058-1500-S10-rev002

Site ID PND165 Technician Martin Valvur Site Visit Date 05/03/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR3000	2516	000403
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	0000162757	00534
Flow Rate	Apex	AXMC105LPMDPC	illegible	000871
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07123
Noy	Teledyne	T200U	101	000795
Ozone	ThermoElectron Inc	49i A1NAA	1009241798	000621
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200011	000435
Sample Tower	Aluma Tower	В	AT-81213-J12	000055
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14800	06539
Zero air pump	Werther International	C 70/4	000815264	06881

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
YEL4	408-Martin	Valvur-05/06/2021				
1	5/6/2021	DAS	Environmental Sys Corp	None	8832	A4888K
2	5/6/2021	Elevation	Elevation	None	1	None
3	5/6/2021	Filter pack flow pump	Thomas	none	107CA18B	111900000185
4	5/6/2021	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	Illgeible
5	5/6/2021	Infrastructure	Infrastructure	none	none	none
6	5/6/2021	Met tower	Climatronics	01362	14 inch taper	illegible
7	5/6/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	1172090002
8	5/6/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAB	0926938297
9	5/6/2021	Printer	Hewlett Packard	none	840C	unknown
10	5/6/2021	Sample Tower	Aluma Tower	illegible	В	none
11	5/6/2021	Shelter Temperature	ARS	none	none	none
12	5/6/2021	Siting Criteria	Siting Criteria	None	1	None
13	5/6/2021	Temperature2meter	RM Young	none	41342VC	029239
14	5/6/2021	Zero air pump	Werther International	none	PC 70/4	000836215

#### **DAS Data Form** 1.92 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg **Environmental Sys** A4888K YEL408 Martin Valvur 05/06/2021 DAS Primary Das Date: 5 /6 /2021 **Audit Date** 5 /6 /2021 ΗY Parameter DAS Mfg 07:52:55 07:51:00 Das Time: **Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** 126 Das Day: 126 **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 0.0005 0.0002 0.0005 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 8 0.0000 V -0.0004 -0.0004 0.00008 0.1000 0.0995 0.0996 V V 0.0001 8 0.3000 0.2996 0.2999 V V 0.0003V V 8 0.5000 0.4999 0.4998 -0.0001 V 8 0.7000 V 0.0005 0.6994 0.6999 V V 8 0.9000 0.8997 0.8995 -0.0002 8 1.0000 0.9997 0.9996 V V -0.0001

#### Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter Alicat Martin Valvur 05/06/2021 Illgeible YEL408 Flow Rate none 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** -0.011 **DAS 2: DAS 1:** Cal Factor Zero 5.014 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 1.54% 1.81% 3.65 **Rotometer Reading:** Desc. Test type Input l/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignal PctDifference 0.00001/mprimary pump off 0.0000.0000.03 0.051/mleak check 0.000 0.000 0.01 0.00000.03 1/ml/mprimary 2.98 0.0000 2.98 1/m 1.43% test pt 1 2.963 2.940 1/mprimary 2.960 2.930 2.98 0.0000 2.98 1/m1/m1.81% primary test pt 2 2.98 0.00001/m1.39% test pt 3 2.965 2.940 2.98 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

Condition 5.5 cm

Condition 2.0 cm

Condition 90 deg

Condition

Status pass

Status pass

Status pass

Status pass

Sensor Component Filter Distance

Sensor Component Filter Depth

**Sensor Component** Filter Azimuth

Sensor Component System Memo

## **Ozone Data Form**

Mfg	Serial Numbe	er Tag Site		Tecl	hnician	Site Visit Date	Parameter	Owner ID
ThermoElectron	Inc 1172090002	YEL408	3	Mar	rtin Valvur	05/06/2021	Ozone	none
Slope: Intercept CorrCoff:		rcept	0.00000 0.00000 0.00000	5	Mfg Serial Number Ffer ID	ThermoElectron 49CPS-70008-3 01110		neter ozone  Desc. Ozone primary stan
DAS 1:	D.	AS 2:				4.000	10 •	0.02220
	A Max % Dif A		Max % Di		Slope	1.0034	10 Intercep	
0.0%	0.0%				Cert Date	1/20/202	21 CorrCo	ff 1.00000
UseDescription	1 ConcGroup	Tfer Raw	Tfer C	orr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.61	0.58	3	0.16	ppb		-0.42
primary	2	17.71	17.53	3	16.81	ppb		-0.72
primary	3	38.72	38.30	6	37.21	ppb	-3.	.04
primary	4	64.26	63.68	8	61.89	ppb	-2	.85
primary	5	111.77	110.7		107.20	ppb		.28
	onent Audit Pressi	1			576.5 mmHg	PPO	Status pas	
Sensor Compo	onent 26.6 degree	unobstructed ru	ıle Coı	nditio	n True		Status pas	ss
_	onent Tree dewline			nditio	n True		Status pas	SS
_	onent ADT <100 v						Status pas	
•	onent ADT >100 v						Status pas	
•	onent Sample Tra				n Good		Status pas	
	onent Inlet Filter C				n Clean		Status pas	
Sensor Compo		- Citation		nditio			Status pas	
Sensor Compo		_			0.978		Status pas	
	onent Zero Voltage			nditio			Status pas	
_	onent Fullscale Vo			nditio			Status pas	
	onent Cell A Freq.				113.2 kHz		Status pas	
•	onent Cell A Noise				0.6 ppb		Status pas	
Sensor Comp	onent Cell A Flow		Coi	nditio	0.64 lpm		Status pas	SS
Sensor Compo	onent Cell A Press	sure	Con	nditio	559.7 mmHg		Status pas	ss
Sensor Comp	onent Cell A Tmp.		Coi	nditio	36.2 C		Status pas	ss
Sensor Comp	onent Cell B Freq.		Con	nditio	70.7 kHz		Status pas	ss
Sensor Comp	onent Cell B Noise	;	Con	nditio	0.2 ppb		Status pas	SS
Sensor Compo	onent Cell B Flow		Con	nditio	0.67 lpm		Status pas	SS
Sensor Comp	onent Cell B Press	sure	Con	nditio	n 559.1 mmHg		Status pas	ss
Sensor Comp	onent System Mer	no	Con	nditio	n		Status pas	ss

### 2 Meter Temperature Data Form Calc. Difference Serial Number Tag Site **Technician** Site Visit Date Parameter Mfg **Owner ID** YEL408 Martin Valvur 05/06/2021 RM Young 029239 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** 0.09 0.15 UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Difference Test type Temp Low Rang 0.01 0.02 0.0000-0.06 C -0.08 primary 23.11 23.12 0.0000 23.09 C -0.03 primary Temp Mid Range Temp High Rang primary 46.51 46.53 0.0000 46.38C -0.15 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 Martin Valvur none YEL408 05/06/2021 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** 0.14 0.26 01229 Tfer ID -0.00824 **Slope** 0.99975 Intercept 2/9/2021 1.00000 **Cert Date** CorrCoff UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Mid Range 22.92 22.93 0.00023.0 $\mathbf{C}$ 0.04 25.39 25.40 25.7 C Temp Mid Range 0.0000.26 primary C 24.34 24.35 0.000 primary Temp Mid Range 24.2 -0.11 Status pass Sensor Component System Memo Condition

# **Siting Criteria Form**

<b>Sensor Component</b>	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	YEL408	Technician	Martin Valvur	Site Visit Date	05/06/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2880-1)	640 cuft

<b>Sensor Component</b>	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	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: SiteOpsProcComm

Gloves are not used to handle the filter pack.

2 Parameter: DasComments

The shelter heat and air conditioner run simultaneously.

3 Parameter: SiteOpsProcedures

The ozone inlet filter is replaced and the system is leak tested every two weeks.

4 Parameter: SitingCriteriaCom

The site is located at the edge of a tree line. Trees as tall as 8 meters are near the sample inlet. Trees taller than 10 meters are 15 meters from the inlet

5 Parameter: ShelterCleanNotes

The shelter is organized and well maintained.

Field Systems Da	nta Form	]	F-02058-1500-S1-rev002				
Site ID YEL408	Technician Martin Valvur	Site Visit Date 05/0	6/2021				
Site Sponsor (agency)	NPS	USGS Map	Lake				
<b>Operating Group</b>	NPS	Map Scale					
AQS#	56-039-1011	Map Date					
<b>Meteorological Type</b>	Climatronics						
Air Pollutant Analyzer	Ozone, IMPROVE	<b>QAPP</b> Latitude	44.5597				
<b>Deposition Measurement</b>	dry	<b>QAPP</b> Longitude	-110.4006				
Land Use	woodland - evergreen	<b>QAPP Elevation Meters</b>	2400				
Terrain	complex	<b>QAPP Declination</b>					
Conforms to MLM	Marginally	<b>QAPP Declination Date</b>					
Site Telephone	(307) 242-2410	Audit Latitude	44.565356				
Site Address 1	Lake Ranger Station	Audit Longitude	-110.400338				
Site Address 2	route 14	<b>Audit Elevation</b>	2430				
County	Teton	<b>Audit Declination</b>	11.9				
City, State	Yellowstone National Park, WY	Present					
Zip Code	82190	Fire Extinguisher	New in 2017				
Time Zone	Mountain	First Aid Kit					
<b>Primary Operator</b>		Safety Glasses					
Primary Op. Phone #		Safety Hard Hat					
Primary Op. E-mail		Climbing Belt					
<b>Backup Operator</b>		Security Fence					
Backup Op. Phone #		Secure Shelter					
Backup Op. E-mail		Stable Entry Steps					
<b>Shelter Working Room ✓</b>	Make Ekto Me	odel 8810 (s/n 2880-1)	Shelter Size 640 cuft				
	Notes The shelter is organized and w	ell maintained.					
	Notes						
Priving Directions  From Jackson take route 191 / 89 north to Yellowstone National Park. At Thumb Junction take 14 east around Yellowstone Lake. Turn left just past the Lake Area (and hotel) into the park residence and office compound. Continue through the compound past the housing area. The site is up the hill through the gate to the water supply tank for the compound.							

Fic	eld Systems Data Form		F-02058-1500-S3-rev002
Site	YEL408 Technician Martin Valvur		Site Visit Date 05/06/2021
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	<b>✓</b>	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)	<b>✓</b>	N/A
3	Are the tower and sensors plumb?	<b>✓</b>	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	<b>✓</b>	
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)	<b>✓</b>	
6	Is the solar radiation sensor plumb?	<b>✓</b>	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	<b>✓</b>	N/A
8	Is the rain gauge plumb?	<b>✓</b>	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	<b>✓</b>	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	<b>✓</b>	N/A
11	Is it inclined approximately 30 degrees?	<b>✓</b>	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:

Site ID YEL408 Technician Martin Valvur Site Visit Date 05/06/2021  1 Do all the meterological sensors appear to be intact, in good condition, and well maintained? 2 Are all the meterological sensors operational online, and reporting data? 3 Are the shields for the temperature and RH sensors clean? 4 Are the aspirated motors working? 5 Is the solar radiation sensor's lens clean and free of scratches? 6 Is the surface wetness sensor grid clean and undamaged? 7 Are the sensor signal and power cables intact, in good condition, and well maintained? 8 Are the sensor signal and power cable connections protected from the elements and well maintained?  Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:	Fi	eld Systems Data Form	F-02058-1500-S4-rev002
condition, and well maintained?  2 Are all the meteorological sensors operational online, and reporting data?  3 Are the shields for the temperature and RH sensors clean?  4 Are the aspirated motors working?  5 Is the solar radiation sensor's lens clean and free of scratches?  6 Is the surface wetness sensor grid clean and undamaged?  7 Are the sensor signal and power cables intact, in good condition, and well maintained?  8 Are the sensor signal and power cable connections protected from the elements and well maintained?  Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,	Site	Technician Martin Valvur	Site Visit Date 05/06/2021
reporting data?  3 Are the shields for the temperature and RH sensors clean?  4 Are the aspirated motors working?  5 Is the solar radiation sensor's lens clean and free of scratches?  6 Is the surface wetness sensor grid clean and undamaged?  7 Are the sensor signal and power cables intact, in good condition, and well maintained?  8 Are the sensor signal and power cable connections protected from the elements and well maintained?  Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,	1		
4 Are the aspirated motors working?  5 Is the solar radiation sensor's lens clean and free of scratches?  6 Is the surface wetness sensor grid clean and undamaged?  7 Are the sensor signal and power cables intact, in good condition, and well maintained?  8 Are the sensor signal and power cable connections protected from the elements and well maintained?  Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,	2		
5 Is the solar radiation sensor's lens clean and free of scratches? 6 Is the surface wetness sensor grid clean and undamaged?  7 Are the sensor signal and power cables intact, in good condition, and well maintained?  8 Are the sensor signal and power cable connections protected from the elements and well maintained?  Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,	3	Are the shields for the temperature and RH sensors clean?	
scratches?  6 Is the surface wetness sensor grid clean and undamaged?  7 Are the sensor signal and power cables intact, in good condition, and well maintained?  8 Are the sensor signal and power cable connections protected from the elements and well maintained?  Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,	4	Are the aspirated motors working?	
7 Are the sensor signal and power cables intact, in good condition, and well maintained?  8 Are the sensor signal and power cable connections protected from the elements and well maintained?  Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,	5		✓ N/A
condition, and well maintained?  8 Are the sensor signal and power cable connections protected from the elements and well maintained?  Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,	6	Is the surface wetness sensor grid clean and undamaged?	N/A
from the elements and well maintained?  Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,	7		
	8		

Field Systems Data Form			F-02058-1500-S5-rev002
Site ID YEL408 Te	chnician Martin Valvur		Site Visit Date 05/06/2021
Siting Criteria: Are the pollutant ar	nalyzers and deposition eq	<u>uipn</u>	nent sited in accordance with 40 CFR 58, Appendix E
1 Do the sample inlets have at least a unrestricted airflow?	270 degree arc of	<b>✓</b>	
2 Are the sample inlets 3 - 15 meters a	above the ground?	<b>✓</b>	
3 Are the sample inlets > 1 meter from and 20 meters from trees?	n any major obstruction,		10 to 15 meters from trees
Pollutant analyzers and deposition	equipment operations and	mai	ntenance
1 Do the analyzers and equipment ap condition and well maintained?	pear to be in good	<b>✓</b>	
2 Are the analyzers and monitors opereporting data?	rational, on-line, and	<b>✓</b>	
3 Describe ozone sample tube.			1/4 teflon by 12 meters
4 Describe dry dep sample tube.			3/8 teflon by 9 meters
5 Are in-line filters used in the ozone indicate location)	sample line? (if yes	<b>✓</b>	At inlet only
6 Are sample lines clean, free of kinks obstructions?	s, moisture, and	<b>✓</b>	
7 Is the zero air supply desiccant unsa	aturated?	<b>✓</b>	
8 Are there moisture traps in the sam	ple lines?	<b>✓</b>	Flow line only
9 Is there a rotometer in the dry depo	sition filter line, and is it	<b>✓</b>	Clean and dry
Provide any additional explanation (phot natural or man-made, that may affect the		ary)	regarding conditions listed above, or any other features,

### Field Systems Data Form F-02058-1500-S6-rev002 YEL408 Technician | Martin Valvur Site Visit Date 05/06/2021 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) 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 Shelter not grounded 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** 11 Tower comments?

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

The shelter heat and air conditioner run simultaneously.

### Field Systems Data Form F-02058-1500-S7-rev002 YEL408 Technician | Martin Valvur Site Visit Date 05/06/2021 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 V** Relative humidity sensor Computer **V** Solar radiation sensor **V** Modem П **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 **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** DataView2 **SSRF V ✓ ✓ V** Site Ops Manual July 2016 **V HASP ✓** July 2016 **✓** Field Ops Manual July 2016 **V Calibration Reports ✓** Not current Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ Dataview 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 YEL408 Technician Martin Valvur Site Visit Date 05/06/2021 Site ID Site operation procedures Trained by ARS on site 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** Monthly and semiannually **V V Automatic Zero/Span Tests** Daily **V V** Every 2 weeks Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests V Manual Precision Level Test V ✓** Alarm values only **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 ~** 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? **✓** Dataview 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, natural or man-made, that may affect the monitoring parameters:

The ozone inlet filter is replaced and the system is leak tested every two weeks.

reported? If yes, how?

Fi	eld Sy	stems Data For	m			F-02058-1500-S9-rev002				
Sit	e ID	YEL408	Technicia	n Martin Valvur		Site Visit Date	05/06/2021			
	Site oper	ration procedures								
1	Is the file	ter pack being changed	every Tues	sday as scheduled?	<b>V</b>	Filter changed morinings				
2 Are the Site Status Report Forms being completed and filed correctly?										
3	Are data	downloads and backuped?	os being pe	rformed as		No longer required				
4	4 Are general observations being made and recorded? How?					Dataview, SSRF				
5	5 Are site supplies on-hand and replenished in a timely fashion?				<b>✓</b>					
6	Are sample flow rates recorded? How?					SSRF				
7	7 Are samples sent to the lab on a regular schedule in a timely fashion?				<b>✓</b>					
8		rs protected from conta ping? How?	mination d	luring handling						
9	9 Are the site conditions reported regularly to the field operations manager or staff?									
QC	Check Pe	erformed	F	requency			Compliant			
I	Multi-poin	t MFC Calibrations	✓ S	emiannually			✓			
Flow System Leak Checks Weekly					✓					
I	Filter Pack	<b>Inspection</b>								
I	Flow Rate Setting Checks Weekly						✓			
1	Visual Che	eck of Flow Rate Rotom	eter 💆 🛚	eekly eekly			<b>✓</b>			
In-line Filter Inspection/Replacement										
Sample Line Check for Dirt/Water										
		dditional explanation (p				) regarding conditi	ons listed above, or an	y other features,		

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

Gloves are not used to handle the filter pack.

# **Field Systems Data Form**

## F-02058-1500-S10-rev002

Site ID YEL408 Technician Martin Valvur Site Visit Date 05/06/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8832	A4888K	None
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18B	111900000185	none
Flow Rate	Alicat	MC-10SLPM-D-PCV	Illgeible	none
Infrastructure	Infrastructure	none	none	none
Met tower	Climatronics	14 inch taper	illegible	01362
Ozone	ThermoElectron Inc	49i A3NAA	1172090002	none
Ozone Standard	ThermoElectron Inc	49i A1NAB	0926938297	none
Printer	Hewlett Packard	840C	unknown	none
Sample Tower	Aluma Tower	В	none	illegible
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	029239	none
Zero air pump	Werther International	PC 70/4	000836215	none

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
DCF	DCP114-Korey Devins-05/14/2021									
1	5/14/2021	Computer	Dell	07031	Inspiron 15	4L2MC12				
2	5/14/2021	DAS	Campbell	000345	CR3000	2124				
3	5/14/2021	Elevation	Elevation	None	1	None				
4	5/14/2021	Filter pack flow pump	Thomas	00390	107CA18	00001630787				
5	5/14/2021	Flow Rate	Apex	000659	AXMC105LPMDPCV	54748				
6	5/14/2021	Infrastructure	Infrastructure	none	none	none				
7	5/14/2021	Modem	Digi	07199	LR54	unknown				
8	5/14/2021	Ozone	ThermoElectron Inc	000628	49i A1NAA	1009241786				
9	5/14/2021	Ozone Standard	ThermoElectron Inc	000374	49i A3NAA	0726124694				
10	5/14/2021	Sample Tower	Aluma Tower	000030	В	AT-81056-J-4				
11	5/14/2021	Shelter Temperature	Campbell	none	107-L	none				
12	5/14/2021	Siting Criteria	Siting Criteria	None	1	None				
13	5/14/2021	Temperature	RM Young	06390	41342VC	13993				
14	5/14/2021	Zero air pump	Werther International	06939	PC70/4	000829175				

#### **DAS Data Form DAS Time Max Error:** 0 **Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Campbell 2124 DCP114 Korey Devins 05/14/2021 DAS Primary Das Date: 5 /14/2021 **Audit Date** 5 /14/2021 Fluke Parameter DAS Mfg 10:57:00 10:57:00 Das Time: **Audit Time** 95740135 Tfer Desc. DVM **Serial Number** 134 Das Day: 134 **Audit Day** Tfer ID 01311 **Low Channel: High Channel: Avg Diff: Avg Diff: Max Diff: Max Diff:** 1.00000 0.00000 **Slope** Intercept 0.0001 0.0001 0.0002 0.0002 2/11/2021 1.00000 **Cert Date** CorrCoff Datel Parameter DAS Mfg **Serial Number** 15510194 Tfer Desc. Source generator (D 01320 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/13/2012 1.00000 **Cert Date** CorrCoff Channel Input **DVM** Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V -0.0002 0.0000 0.0002 7 0.1000 0.0997 0.0999 V V 0.0002 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 0.0001 7 0.6994 0.6995 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 DCP114 Korey Devins 05/14/2021 000659 Apex 54748 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** 0.003 **DAS 2: DAS 1:** Cal Factor Zero 0.991 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.00% 0.00% 1.4 **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 0.0000.01 1/ml/m leak check 0.000 0.000 -0.01 0.0000.00 1/ml/mprimary 1.52 0.000 1/m 0.00% test pt 1 1.491 1.500 1.50 1/mprimary 1.491 1.500 1.52 0.000 1.50 1/m1/m0.00% primary test pt 2 0.0001/m0.00% primary test pt 3 1.494 1.500 1.52 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 3.0 cm Status pass Sensor Component Filter Depth Condition 2.0 cm Status pass Status pass **Sensor Component** Filter Azimuth Condition 310 deg Status pass Sensor Component System Memo Condition

## **Ozone Data Form**

Intercept         -0.30228         Intercept         0.00000           CorrCoff:         0.99998         CorrCoff:         0.00000    Serial Number  1180030022  Tfer Desc. Ozone primary stan  01114	Mfg	Serial Number	er Tag Site		Te	chnician	Site Visit Date	Parame	eter	Owner ID
Name	ThermoElectron Inc	1009241786	DCP114		Ko	orey Devins	05/14/2021	Ozone		000628
Avg % Diff: A Max % Dif	Intercept	0.30228 Inte	rcept	0.00000		Serial Number	1180030022			
Avg % Diff: A Max % Dif	DAS 1:	D	AS 2:			Slope	1.0003	30 Inter	cept	0.30550
UseDescription   ConcGroup   TFer Raw   Tfer Corr   Site   Site Unit   RelPerDif   AbsDif   Primary   1   0.40   0.09   0.01   ppb   0.08   0.08   Primary   2   15.78   15.39   15.25   ppb   0.08   0.01   Ppb   0.09	A Avg % Diff: A M	Max % Dif A	Avg %Diff A	Max %	Dif	-	1/20/202		-	1,00000
Primary   1	0.0%	0.0%				Cert Date	1/20/202	21 Corr	C011	1.00000
Primary   2   15.78   15.39   15.25   ppb   -0.14	UseDescription	ConcGroup	Tfer Raw	Tfer	Corr	Site	Site Unit	RelPer	Dif	AbsDif
Primary   3   35.20   34.72   34.63   Ppb   -0.26   Ppimary   4   67.48   66.83   66.75   Ppb   -0.12   Ppimary   5   112.66   111.79   112.80   Ppb   -0.9   Ppb   -0.12   Ppm		1		0.	09	0.01	ppb			-0.08
Primary   3   35.20   34.72   34.63   ppb   -0.26	primary	2	15.78	15	.39	15.25				-0.14
Primary   4   67.48   66.83   66.75   ppb   0.012		3	35.20	34	.72	34.63			-0.26	
Sensor Component   Audit Pressure   Condition   745.3 mmHg   Status   pass		4		66	.83	66.75	**		-0.12	
Sensor Component Audit Pressure  Condition True  Status pass  Sensor Component 26.6 degree unobstructed rule  Condition True  Status pass  Sensor Component Tree dewline >10m or below inlet  Condition 8 m  Status Fail  Sensor Component ADT <100 vehicles further than 20  Condition Good  Status pass  Sensor Component Inlet Filter Condition  Condition Good  Status pass  Sensor Component Offset  Condition O.5  Status pass  Sensor Component Span  Condition Inlet Filter Condition  Condition Inlet Filter Condition  Condition Inlet Inlet Filter Condition  Condition Inlet Filter Condition  Sensor Component Span  Condition Inlet Inlet Filter Condition  Sensor Component Span  Condition Inlet Inlet Filter Condition  Sensor Component Fullscale Voltage  Condition Inlet Filter Condition  N/A  Status pass  Sensor Component Cell A Freq.  Condition Inlet Filter Condition  Sensor Component Cell A Freq.  Condition Inlet Filter Condition  Status pass  Sensor Component Cell A Freq.  Condition Inlet Filter Condition  Status pass  Sensor Component Cell A Freq.  Condition Inlet Filter Condition  Status pass  Sensor Component Cell A Freq.  Condition Inlet Filter Condition  Status pass  Sensor Component Cell A Freq.  Condition Inlet Filter Condition  Status pass  Sensor Component Cell A Freq.  Condition Inlet Filter Condition  Status pass  Sensor Component Cell A Freq.  Condition Inlet Filter Condition  Status pass  Sensor Component Cell B Freq.  Condition Inlet Filter Condition  Status pass  Sensor Component Cell B Filow  Condition Inlet Filter Status pass  Sensor Component Cell B Filow  Condition Inlet Filter Condition  Status pass  Sensor Component Cell B Filow  Condition Inlet Filter Condition  Status pass  Sensor Component Cell B Filow  Condition Inlet Filter Condition  Status pass  Sensor Component Cell B Filow  Condition Inlet Filter Filter Condition  Status Pass  Status pass  Sensor Component Cell B Filow  Condition Inlet Filter Filter Condition  Status Pass  Status Pass  Status Pass  Status Pass  Sensor Component Cell B Filow  Co		5					1			
Sensor Component Tree dewline > 10m or below inlet Sensor Component ADT < 100 vehicles further than 20 Condition True Status pass Sensor Component ADT > 100 vehicles further than 50 Sensor Component ADT > 100 vehicles further than 50 Condition A17 m Status Fail Sensor Component Sample Train Condition Good Status pass Sensor Component Inlet Filter Condition Condition Clean Status pass Sensor Component Offset Condition O.5 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 O.73 lpm Status pass Sensor Component Cell A Pressure Condition O.73 lpm Status pass Sensor Component Cell A Tmp. Condition O.73 lpm Status pass Sensor Component Cell A Tmp. Condition O.74 lpm Status pass Sensor Component Cell B Freq. Condition O.9 ppb Status pass Sensor Component Cell B Freq. Condition O.9 ppb Status pass Sensor Component Cell B Freq. Condition O.73 lpm Status pass Sensor Component Cell B Freq. Condition O.73 lpm Status pass Sensor Component Cell B Freq. Condition O.79 lpb Status pass Sensor Component Cell B Freq. Condition O.9 ppb Status pass Sensor Component Cell B Freq. Condition O.9 ppb Status pass Sensor Component Cell B Freq. Condition O.9 ppb Status pass Sensor Component Cell B Flow Condition O.71 lpm Status pass Sensor Component Cell B Flow Condition O.71 lpm Status pass		Audit Pressu	ıre			on 745.3 mmHg		Status	pass	
Sensor Component ADT <100 vehicles further than 20 Condition True  Sensor Component ADT >100 vehicles further than 50 Condition 417 m  Status Fall  Sensor Component Sample Train  Condition Good  Status pass  Sensor Component Inlet Filter Condition  Condition O.5  Status pass  Sensor Component Offset  Condition I.022  Status pass  Sensor Component Zero Voltage  Condition IVA  Status pass  Sensor Component Fullscale Voltage  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell A Noise  Condition IVA  Sensor Component Cell A Flow  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell A Flow  Condition IVA  Status pass  Sensor Component Cell A Flow  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell B Freq.  Condition IVA  Status pass  Sensor Component Cell B Freq.  Condition IVA  Status pass  Sensor Component Cell B Noise  Condition IVA  Status pass  Sensor Component Cell B Noise  Condition IVA  Status pass  Sensor Component Cell B Freq.  Condition IVA  Status pass  Sensor Component Cell B Noise  Condition IVA  Status pass  Sensor Component Cell B Freq.  Condition IVA  Status pass  Sensor Component Cell B Freq.  Condition IVA  Status pass  Sensor Component Cell B Freq.  Condition IVA  Status pass	Sensor Compone	26.6 degree	unobstructed ru	le (	Conditi	on True		Status	pass	
Sensor Component ADT <100 vehicles further than 20 Condition True  Sensor Component ADT >100 vehicles further than 50 Condition 417 m  Status Fall  Sensor Component Sample Train  Condition Good  Status pass  Sensor Component Inlet Filter Condition  Condition O.5  Status pass  Sensor Component Offset  Condition I.022  Status pass  Sensor Component Zero Voltage  Condition IVA  Status pass  Sensor Component Fullscale Voltage  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell A Noise  Condition IVA  Sensor Component Cell A Flow  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell A Flow  Condition IVA  Status pass  Sensor Component Cell A Flow  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell A Freq.  Condition IVA  Status pass  Sensor Component Cell B Freq.  Condition IVA  Status pass  Sensor Component Cell B Freq.  Condition IVA  Status pass  Sensor Component Cell B Noise  Condition IVA  Status pass  Sensor Component Cell B Noise  Condition IVA  Status pass  Sensor Component Cell B Freq.  Condition IVA  Status pass  Sensor Component Cell B Noise  Condition IVA  Status pass  Sensor Component Cell B Freq.  Condition IVA  Status pass  Sensor Component Cell B Freq.  Condition IVA  Status pass  Sensor Component Cell B Freq.  Condition IVA  Status pass	Sensor Compone	Tree dewline	e >10m or below	inlet (	Conditi	<b>on</b> 8 m		Status	Fail	
Sensor Component ADT >100 vehicles further than 50 Condition 417 m Status Fail  Sensor Component Sample Train Condition Good Status pass  Sensor Component Inlet Filter Condition Condition Olean Status pass  Sensor Component Offset Condition -0.5 Status pass  Sensor Component Span Condition 1.022 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 95.8 kHz Status pass  Sensor Component Cell A Noise Condition 0.9 ppb Status pass  Sensor Component Cell A Flow Condition 0.73 lpm Status pass  Sensor Component Cell A Freq. Condition 34.9 C Status pass  Sensor Component Cell B Freq. Condition 99.1 kHz Status pass  Sensor Component Cell B Noise Condition 0.9 ppb Status pass  Sensor Component Cell B Noise Condition 0.9 ppb Status pass  Sensor Component Cell B Noise Condition 0.9 ppb Status pass  Sensor Component Cell B Freq. Condition 0.9 ppb Status pass  Sensor Component Cell B Noise Condition 0.9 ppb Status pass  Sensor Component Cell B Noise Condition 0.71 lpm Status pass  Sensor Component Cell B Flow Condition 0.71 lpm Status pass  Sensor Component Cell B Flow Condition 0.71 lpm Status pass	Sensor Compone	ent ADT <100 v	ehicles further th	an 20 (	Conditi	on True				
Sensor Component Sample Train  Condition Good  Status pass  Sensor Component Inlet Filter Condition  Condition Clean  Status pass  Sensor Component Offset  Condition 1.022  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 95.8 kHz  Sensor Component Cell A Noise  Condition 0.9 ppb  Status pass  Sensor Component Cell A Flow  Condition 0.73 lpm  Status pass  Sensor Component Cell A Tmp.  Condition 34.9 C  Sensor Component Cell B Freq.  Condition 99.1 kHz  Status pass  Sensor Component Cell B Noise  Condition 0.9 ppb  Status pass  Sensor Component Cell B Flow  Condition 0.9 ppb  Status pass  Sensor Component Cell B Noise  Condition 0.9 ppb  Status pass  Sensor Component Cell B Preq.  Condition 0.9 ppb  Status pass  Sensor Component Cell B Preq.  Condition 0.9 ppb  Status pass  Sensor Component Cell B Pressure  Condition 0.71 lpm  Status pass  Sensor Component Cell B Pressure  Condition 0.71 lpm  Status pass  Sensor Component Cell B Pressure  Condition 0.71 lpm  Status pass	•									
Sensor Component Inlet Filter Condition  Condition Clean  Status pass  Sensor Component Offset  Condition 1.022  Status pass  Sensor Component Span  Condition Inlet Filter Condition  N/A  Status pass  Sensor Component Fullscale Voltage  Condition N/A  Status pass  Sensor Component Fullscale Voltage  Condition N/A  Status pass  Sensor Component Cell A Freq.  Condition 0.9 ppb  Status pass  Sensor Component Cell A Flow  Condition 0.73 lpm  Status pass  Sensor Component Cell A Pressure  Condition 0.715.5 mmHg  Status pass  Sensor Component Cell A Tmp.  Condition 34.9 C  Status pass  Sensor Component Cell B Freq.  Condition 99.1 kHz  Status pass  Sensor Component Cell B Noise  Condition 0.9 ppb  Status pass  Sensor Component Cell B Freq.  Condition 0.9 ppb  Status pass  Sensor Component Cell B Freq.  Condition 0.9 ppb  Status pass  Sensor Component Cell B Freq.  Condition 0.71 lpm  Status pass  Sensor Component Cell B Fressure  Condition 0.71 lpm  Status pass  Sensor Component Cell B Pressure  Condition 716.1 mmHg  Status pass	•									
Sensor Component Offset  Condition -0.5  Status pass  Sensor Component Span  Condition 1.022  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 95.8 kHz  Status pass  Sensor Component Cell A Noise  Condition 0.9 ppb  Status pass  Sensor Component Cell A Flow  Condition 0.73 lpm  Status pass  Sensor Component Cell A Pressure  Condition 715.5 mmHg  Status pass  Sensor Component Cell B Pressure  Condition 99.1 kHz  Status pass  Sensor Component Cell B Noise  Condition 0.9 ppb  Status pass  Sensor Component Cell B Noise  Condition 0.9 ppb  Status pass  Sensor Component Cell B Noise  Condition 0.9 ppb  Status pass  Sensor Component Cell B Flow  Condition 0.71 lpm  Status pass  Sensor Component Cell B Pressure  Condition 716.1 mmHg  Status pass										
Sensor Component Span Condition 1.022 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 0.9 p. Status pass  Sensor Component Cell A Noise Condition 0.73 lpm Status pass  Sensor Component Cell A Flow Condition 0.73 lpm Status pass  Sensor Component Cell A Pressure Condition 715.5 mmHg Status pass  Sensor Component Cell A Tmp. Condition 34.9 C Status pass  Sensor Component Cell B Freq. Condition 99.1 kHz Status pass  Sensor Component Cell B Noise Condition 0.9 ppb Status pass  Sensor Component Cell B Noise Condition 0.71 lpm Status pass  Sensor Component Cell B Flow Condition 716.1 mmHg Status pass	-		ondition							
Sensor Component       Zero Voltage       Condition       N/A       Status       pass         Sensor Component       Fullscale Voltage       Condition       N/A       Status       pass         Sensor Component       Cell A Freq.       Condition       0.9 ppb       Status       pass         Sensor Component       Cell A Flow       Condition       0.73 lpm       Status       pass         Sensor Component       Cell A Pressure       Condition       715.5 mmHg       Status       pass         Sensor Component       Cell A Tmp.       Condition       34.9 C       Status       pass         Sensor Component       Cell B Freq.       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Roise       Condition       0.71 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       716.1 mmHg       Status       pass	•									
Sensor Component       Fullscale Voltage       Condition       N/A       Status       pass         Sensor Component       Cell A Freq.       Condition       95.8 kHz       Status       pass         Sensor Component       Cell A Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell A Flow       Condition       715.5 mmHg       Status       pass         Sensor Component       Cell A Tmp.       Condition       34.9 C       Status       pass         Sensor Component       Cell B Freq.       Condition       99.1 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.71 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       716.1 mmHg       Status       pass	-									
Sensor Component       Cell A Freq.       Condition       95.8 kHz       Status       pass         Sensor Component       Cell A Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell A Flow       Condition       0.73 lpm       Status       pass         Sensor Component       Cell A Pressure       Condition       715.5 mmHg       Status       pass         Sensor Component       Cell A Tmp.       Condition       34.9 C       Status       pass         Sensor Component       Cell B Freq.       Condition       99.1 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.71 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       716.1 mmHg       Status       pass	•									
Sensor Component       Cell A Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell A Flow       Condition       715.5 mmHg       Status       pass         Sensor Component       Cell A Tmp.       Condition       34.9 C       Status       pass         Sensor Component       Cell B Freq.       Condition       99.1 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.71 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       716.1 mmHg       Status       pass	Sensor Compone	Fullscale Vo	ltage		Conditi	on N/A				
Sensor ComponentCell A FlowCondition0.73 lpmStatuspassSensor ComponentCell A PressureCondition715.5 mmHgStatuspassSensor ComponentCell A Tmp.Condition34.9 CStatuspassSensor ComponentCell B Freq.Condition99.1 kHzStatuspassSensor ComponentCell B NoiseCondition0.9 ppbStatuspassSensor ComponentCell B FlowCondition0.71 lpmStatuspassSensor ComponentCell B PressureCondition716.1 mmHgStatuspass	Sensor Compone	Cell A Freq.		(	Conditi	on 95.8 kHz		Status	pass	
Sensor Component       Cell A Pressure       Condition       715.5 mmHg       Status pass         Sensor Component       Cell A Tmp.       Condition       34.9 C       Status pass         Sensor Component       Cell B Freq.       Condition       99.1 kHz       Status pass         Sensor Component       Cell B Noise       Condition       0.9 ppb       Status pass         Sensor Component       Cell B Flow       Condition       0.71 lpm       Status pass         Sensor Component       Cell B Pressure       Condition       716.1 mmHg       Status pass	Sensor Compone	Cell A Noise	)		Conditi	<b>on</b> 0.9 ppb		Status	pass	
Sensor Component       Cell A Tmp.       Condition       34.9 C       Status pass         Sensor Component       Cell B Freq.       Condition       99.1 kHz       Status pass         Sensor Component       Cell B Noise       Condition       0.9 ppb       Status pass         Sensor Component       Cell B Flow       Condition       0.71 lpm       Status pass         Sensor Component       Cell B Pressure       Condition       716.1 mmHg       Status pass	Sensor Compone	ent Cell A Flow			Conditi	on 0.73 lpm		Status	pass	
Sensor Component       Cell B Freq.       Condition       99.1 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.71 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       716.1 mmHg       Status       pass	Sensor Compone	Cell A Press	sure	(	Conditi	on 715.5 mmHg		Status	pass	
Sensor Component       Cell B Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.71 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       716.1 mmHg       Status       pass	Sensor Compone	ent Cell A Tmp.		(	Conditi	on 34.9 C		Status	pass	
Sensor Component       Cell B Flow       Condition       0.71 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       716.1 mmHg       Status       pass	Sensor Compone	ent Cell B Freq.		(	Conditi	on 99.1 kHz		Status	pass	
Sensor Component Cell B Pressure Condition 716.1 mmHg Status pass	Sensor Compone	ent Cell B Noise	<b>)</b>	(	Conditi	on 0.9 ppb		Status	pass	
	Sensor Component Cell B Flow			(	Conditi	<b>on</b> 0.71 lpm		Status	pass	
Sensor Component System Memo Condition Status pass	Sensor Compone	Sensor Component Cell B Pressure			Conditi	on 716.1 mmHg				
	Sensor Compone	System Mer	no		Conditi	on		Status	pass	

### **Temperature Data Form** Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg DCP114 RM Young Korey Devins 05/14/2021 Temperature 06390 13993 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 0.09 0.23 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.18 -0.04 0.0000.2 $\mathbf{C}$ 0.23 25.7 C Temp Mid Range 26.12 25.71 0.000 -0.02 primary 47.28 46.72 0.000 C -0.02 primary Temp High Range 46.7 **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** DCP114 Korey Devins Campbell none 05/14/2021 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** 0.47 0.54 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 26.79 26.38 0.00026.9 $\mathbf{C}$ 0.53 26.69 27.0 C Temp Mid Range 27.11 0.0000.34 primary C 27.15 26.73 0.000 27.3 0.54 primary Temp Mid Range

Condition

Sensor Component System Memo

Status pass

## **Siting Criteria Form**

<b>Sensor Component</b>	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 DCP114 Technician Korey Devins Site Visit Date 05/14/2021

Shelter Make	Shelter Model	Shelter Size	
Ekto	8810 (s/n 2149-13)	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	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Shelter walls	Condition	Fair	Status	pass
Sensor Component	Excessive mold present	Condition	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

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	DCP114	Korey Devins	05/14/2021	Moisture Present	Apex	3744		
The filter sample tubing	has drops of mo	isture in low section	ns outside the sh	elter.				

## **Field Systems Comments**

1 Parameter: SiteOpsProcComm

The site operator is following procedures and doing a very good job with filter handling.

2 Parameter: DasComments

Met tower removed and sample tower not grounded.

3 Parameter: SiteOpsProcedures

The ozone inlet filter is replaced and the sample line is leak-tested every two weeks.

4 Parameter: SitingCriteriaCom

The site is located in a wooded thicket within a state park. The area surrounding the park is almost completely intensive agriculture. The site may not be regionally representative.

5 Parameter: ShelterCleanNotes

The shelter is currently in good condition. The floor has been recently repaired.

6 Parameter: MetOpMaintCom

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

### **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 05/14/2021 Technician Korey Devins DCP114 Site ID Mount Sterling **USGS Map EPA Site Sponsor (agency)** Map Scale private / state **Operating Group Map Date** 39-047-9991 AQS# R.M. Young **Meteorological Type** 39.6358 Air Pollutant Analyzer Ozone **QAPP** Latitude -83.2600 dry, wet **QAPP** Longitude **Deposition Measurement** 267 Land Use agriculture, woodland - mixed **QAPP Elevation Meters** flat 6.25 Terrain **QAPP Declination** Marginally 2/23/2006 Conforms to MLM **OAPP Declination Date** 39.635888 (740) 869-4722 **Site Telephone Audit Latitude** Waterloo Road -83.260563 Site Address 1 **Audit Longitude** Deer Creek State Park 264 Site Address 2 **Audit Elevation** Fayette -6.3 **County Audit Declination** Mount Sterling, OH City, State **Present** Fire Extinguisher 43143 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 none **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 2149-13) Ekto **Shelter Size** 640 cuft **✓** Notes The shelter is currently in good condition. The floor has been recently repaired. Shelter Clean **✓** Notes Site OK From Circleville take 22/56 west. Stay on 22 through Williamsport. Turn right (north) onto route 207 and follow the **Driving Directions** signs for the park office and lodge. After crossing the river, turn right at the sign for the park office, golf course, and lodge. Continue approximately 1.5 miles and turn right again into the park. Go past the office and golf course and

take the next right onto a stone road. Continue to the end and turn left. The site is on the left before the gas pipeline.

Fie	eld Systems Data Form		F-02058-1500-S3-rev002
Site	DCP114 Technician Korey Devins		Site Visit Date 05/14/2021
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	<b>✓</b>	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	<b>✓</b>	N/A
3	tower into the prevailing wind) Are the tower and sensors plumb?	<b>✓</b>	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	<b>✓</b>	
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)	<b>✓</b>	
6	Is the solar radiation sensor plumb?	<b>✓</b>	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	<b>✓</b>	N/A
8	Is the rain gauge plumb?	<b>✓</b>	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	<b>✓</b>	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	<b>✓</b>	N/A
11	Is it inclined approximately 30 degrees?	<b>✓</b>	N/A

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

Field Systems Data Form	F-02058-1500-S4-rev002
Site ID DCP114 Technician Korey Devins	Site Visit Date 05/14/2021
1 Do all the meterological sensors appear to be intact, in good condition, and well maintained?	✓ N/A
2 Are all the meteorological sensors operational online, and reporting data?	N/A
3 Are the shields for the temperature and RH sensors clean?	Moderately clean
4 Are the aspirated motors working?	N/A
5 Is the solar radiation sensor's lens clean and free of scratches?	✓ N/A
6 Is the surface wetness sensor grid clean and undamaged?	N/A
7 Are the sensor signal and power cables intact, in good condition, and well maintained?	
8 Are the sensor signal and power cable connections protected from the elements and well maintained?	
Provide any additional explanation (photograph or sketch if neces natural or man-made, that may affect the monitoring parameters:	
The temperature sensor is mounted in a naturally aspirated shield on the	

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	DCP114 Technician Korey Devins		Site Visit Date 05/14/2021
	Siting Criteria: Are the pollutant analyzers and deposition eq	uipı	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?		Small trees within 10 meters
	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?	<b>✓</b>	
8	Are there moisture traps in the sample lines?	<b>✓</b>	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	Clean and dry
	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,

### Field Systems Data Form F-02058-1500-S6-rev002 Site ID DCP114 Technician Korey Devins Site Visit Date 05/14/2021 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? Is the sample tower stable and grounded? **V** 11 Tower comments? Tower not grounded

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

Met tower removed and sample tower not grounded.

Field Systems Data I	Form			F-02	058-	1500-S7-rev002
Site ID DCP114	Technician	Korey Devins	Site Visit Date 05	/14/2021		
<b>Documentation</b>						
Does the site have the required	l instrument and	d 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 supply		Data logg Strip chan Computer Modem Printer Zero air p Filter flow Surge pro UPS Lightning Shelter air	er t recorder ump pump tector protection device ater conditioner	Yes	No	
Does the site have the requir	ed and most recorders	ent QC documents and	report forms?	Curre	nt	
Station Log SSRF Site Ops Manual HASP Field Ops Manual Calibration Reports Ozone z/s/p Control Charts Preventive maintenance schedule	✓				••	
<ol> <li>Is the station log properly co</li> <li>Are the Site Status Report F current?</li> <li>Are the chain-of-custody for sample transfer to and from</li> </ol>	forms being com	ppleted and				
4 Are ozone z/s/p control char current?	ts properly com	pleted and	Control charts not used	I		
Provide any additional explanati natural or man-made, that may a			regarding condition	s listed a	bove, o	or any other features,

### Field Systems Data Form F-02058-1500-S8-rev002 DCP114 Technician Korey Devins Site Visit Date 05/14/2021 Site ID Site operation procedures Trained during site installation by ESE employee DDK 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** Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests V 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 V** Weekly Sample Line Check for Dirt/Water **~ V Zero Air Desiccant Check** Weekly **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?

Provide any additional 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

The ozone inlet filter is replaced and the sample line is leak-tested every two weeks.

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

reported? If yes, how?

Field Systems Data Form			F-02058-1500-S9-rev002				
Site ID DCP114 Tec	chnician Korey Devins		Site Visit Date 05/14/2021				
Site operation procedures							
1 Is the filter pack being changed ever	y Tuesday as scheduled?	<b>?</b>	Filter changed morinings				
2 Are the Site Status Report Forms be correctly?	ing completed and filed	<b>✓</b>					
3 Are data downloads and backups be scheduled?	ing performed as		No longer required				
4 Are general observations being made	e and recorded? How?	<b>✓</b>	SSRF, logbook				
5 Are site supplies on-hand and replen fashion?	ished in a timely	<b>✓</b>					
6 Are sample flow rates recorded? Ho	w?	<b>✓</b>	SSRF, logbook, call-in				
7 Are samples sent to the lab on a regularishion?	ılar schedule in a timely	<b>✓</b>					
8 Are filters protected from contamina and shipping? How?	ation during handling	✓	Clean gloves on and off				
9 Are the site conditions reported regularized operations manager or staff?	ılarly to the field	✓					
QC Check Performed	Frequency		Compliant				
Multi-point MFC Calibrations	<b>✓</b> Semiannually		✓				
Flow System Leak Checks	<b>✓</b> Weekly		✓				
Filter Pack Inspection							
Flow Rate Setting Checks	✓ Weekly		✓				
Visual Check of Flow Rate Rotometer	weekly		✓				
In-line Filter Inspection/Replacement	Semiannually		<u> </u>				
Sample Line Check for Dirt/Water	✓ Weekly		✓				
Provide any additional explanation (photo natural or man-made, that may affect the			r) regarding conditions listed above, or any other features,				

The site operator is following procedures and doing a very good job with filter handling.

## **Field Systems Data Form**

## F-02058-1500-S10-rev002

Site ID

DCP114

Technician Korey Devins

Site Visit Date 05/14/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	4L2MC12	07031
DAS	Campbell	CR3000	2124	000345
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	00001630787	00390
Flow Rate	Apex	AXMC105LPMDPC	54748	000659
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07199
Ozone	ThermoElectron Inc	49i A1NAA	1009241786	000628
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124694	000374
Sample Tower	Aluma Tower	В	AT-81056-J-4	000030
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	13993	06390
Zero air pump	Werther International	PC70/4	000829175	06939

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
ZIO433-Martin Valvur-05/17/2021										
1	5/17/2021	Computer	Hewlett Packard	none	6560 b	5CB22906V0				
2	5/17/2021	DAS	Environmental Sys Corp	none	8816	4296				
3	5/17/2021	Modem	Sierra wireless	none	GX450	illegible				
4	5/17/2021	Ozone	ThermoElectron Inc	90568	49C	49C-59348-322				
5	5/17/2021	Ozone Standard	ThermoElectron Inc	90728	49C	49C-70528-366				
6	5/17/2021	Shelter Temperature	ARS	none	unknown	none				
7	5/17/2021	Temperature2meter	RM Young	none	41432VC	15103				
8	5/17/2021	Zero air pump	Werther International	none	PC 70/4	000706556				

### **DAS Data Form** 0.18 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Primary **Environmental Sys** 4296 ZIO433 Martin Valvur 05/17/2021 DAS Das Date: 5 /17/2021 **Audit Date** 5 /17/2021 ΗY Parameter DAS Mfg 07:50:11 07:50:00 **Das Time: Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** 137 Das Day: 137 **Audit Day** Tfer ID 01322 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0001 0.0003 0.0001 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** DAS Output Channel Input **DVM** Output InputUnit OutputUnit Difference 5 0.0000 V -0.0001 0.0000 0.0001 5 0.1000 0.0999 0.0998 V V -0.0001 5 0.3000 0.2996 0.2996 V V 0.0000V V 5 0.5000 0.4995 0.4996 0.0001 V 5 0.7000 V 0.00000.70000.7000V V 5 0.9000 0.9002 0.8999 -0.0003 5 1.0000 1.0001 1.0001 V V 0.0000

## **Ozone Data Form**

Name	Mfg		Serial Numb	er Tag	Site		Te	chnician	Site Visit Date	Parame	eter	Owner ID
Intercept	ThermoElec	ctron Inc	49C-59348-	322	ZIO433		Ma	artin Valvur	05/17/2021	Ozone		90568
DAS 1:   DAS 2:   Slope   1.00340   Intercept   0.02230	Intercept		0.27490 Int	ercept	(	0.0000	)	Serial Number	49CPS-70008-3			
A Avg % Diff: A Max % Dif	DAS 1.		ī	) AS 2:						10 T	,	0.02220
UseDescription   ConcGroup   Tfer Raw   Tfer Corr   Site   Site Unit   RelPerDif   AbsDif   primary   1   0.10   0.07   0.65   ppb   0.58   0.58   ppb   0.58   0.58   primary   2   17.39   17.21   16.90   ppb   0.31   primary   3   37.12   36.77   36.26   ppb   -1.4   -0.31   primary   5   113.29   112.29   110.50   ppb   -1.61		)iff∙ A N			Diff A	May 0	% Dif	Slope	1.0034	+0 Inter	rcept	0.02230
primary   1   0.10   0.07   0.65   ppb   0.58     primary   2   17.39   17.21   16.90   ppb   -1.14     primary   3   37.12   36.77   36.26   ppb   -1.14     primary   4   67.43   66.82   65.65   ppb   -1.77     primary   5   113.29   112.29   110.50   ppb   -1.61     Sensor Component Audit Pressure   Condition   658.8 mmHg   Status   pass     Sensor Component   Tree dewline >10m or below inlet     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   Good   Status   pass     Sensor Component   Differ   Condition   Co				11119		TVICE /		Cert Date	1/20/20	21 Cori	Coff	1.00000
primary   1   0.10   0.07   0.65   ppb   0.58     primary   2   17.39   17.21   16.90   ppb   -1.14     primary   3   37.12   36.77   36.26   ppb   -1.14     primary   4   67.43   66.82   65.65   ppb   -1.77     primary   5   113.29   112.29   110.50   ppb   -1.61     Sensor Component Audit Pressure   Condition   658.8 mmHg   Status   pass     Sensor Component   Tree dewline >10m or below inlet     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   Good   Status   pass     Sensor Component   Differ   Condition   Co	UseDescr	iption	ConcGroup	Tfe	r Raw	Tf	er Corr	Site	Site Unit	RelPer	Dif	AbsDif
Primary   2   17.39   17.21   16.90   ppb   -0.31     Primary   3   37.12   36.77   36.26   ppb   -1.4     Primary   4   67.43   66.82   65.65   ppb   -1.77     Primary   5   113.29   112.29   110.50   ppb   -1.61     Sensor Component Audit Pressure   Condition   658.8 mmHg   Status   pass     Sensor Component Ze6.6 degree unobstructed rule   Condition   True   Status   pass     Sensor Component Tree dewline >10m or below inlet   Condition   True   Status   pass     Sensor Component ADT <100 vehicles further than 20   Condition   True   Status   pass     Sensor Component ADT >100 vehicles further than 50   Condition   Good   Status   pass     Sensor Component   Sample Train   Condition   Good   Status   pass     Sensor Component   Inlet Filter Condition   Condition   Clean   Status   pass     Sensor Component   Sample Train   Condition   Clean   Status   pass     Sensor Component   Span   Condition   Condition   Clean   Status   pass     Sensor Component   Span   Condition			1	C	0.10		0.07	0.65	ppb			0.58
primary 3 37.12 36.77 36.26 ppb -1.4 primary 4 67.43 66.82 65.65 ppb -1.77 primary 5 113.29 112.29 110.50 ppb -1.61 ppb -1.61 ppm -1.79 primary 5 113.29 112.29 110.50 ppb -1.61 ppb -1.61 ppp -1.61	-	•	2						**			
primary 4 67.43 66.82 65.65 ppb -1.77 primary 5 113.29 112.29 110.50 ppb -1.61  Sensor Component Audit Pressure Condition 658.8 mmHg 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 20 Condition True Status pass  Sensor Component ADT >100 vehicles further than 50 Condition True Status pass  Sensor Component Sample Train Condition Good Status pass  Sensor Component Inlet Filter Condition Condition 0.8 Status pass  Sensor Component Offset Condition 0.8 Status pass  Sensor Component Span Condition 1.013 Status pass  Sensor Component Fullscale Voltage Condition 1.000 Status pass  Sensor Component Cell A Freq. Condition 75.7 kHz Status pass  Sensor Component Cell A Nolse Condition 0.72 lpm Status pass  Sensor Component Cell A Freq. Condition 0.72 lpm Status pass  Sensor Component Cell A Freq. Condition 83.9 kHz Status pass  Sensor Component Cell B Freq. Condition 83.9 kHz Status pass  Sensor Component Cell B Nolse Condition 0.72 lpm Status pass  Sensor Component Cell B Nolse Condition 0.72 lpm Status pass  Sensor Component Cell B Nolse Condition 0.72 lpm Status pass  Sensor Component Cell B Nolse Condition 0.72 lpm Status pass  Sensor Component Cell B Nolse Condition 0.72 lpm Status pass  Sensor Component Cell B Nolse Condition 0.72 lpm Status pass  Sensor Component Cell B Nolse Condition 0.72 lpm Status pass  Sensor Component Cell B Nolse Condition 0.72 lpm Status pass  Sensor Component Cell B Nolse Condition 0.72 lpm Status pass  Sensor Component Cell B Nolse Condition 0.72 lpm Status pass	_								**		-1.4	
Sensor Component Audit Pressure   Condition   658.8 mmHg   Status   pass	-								**			
Sensor Component Audit Pressure  Condition  Sensor Component 26.6 degree unobstructed rule  Condition  True  Status  Sensor Component  Tree dewline >10m or below inlet  Condition  True  Status  Sensor Component  ADT <100 vehicles further than 20  Condition  Condition  Condition  Condition  Status  Sensor Component  ADT >100 vehicles further than 20  Condition  Condition  Condition  Condition  Condition  Condition  Status  Sensor Component  Sample Train  Condition  Status  Sensor Component  Status  Sensor Component  Span  Condition  C	-	•							**			
Sensor Component Tree dewline >10m or below inlet Sensor Component Tree dewline >10m or below inlet Sensor Component ADT <100 vehicles further than 20 Sensor Component ADT >100 vehicles further than 50 Sensor Component ADT >100 vehicles further than 50 Sensor Component Sample Train Condition Good Status pass Sensor Component Inlet Filter Condition Condition O.8 Sensor Component Offset Condition O.8 Sensor Component Span Condition I.013 Status pass Sensor Component Zero Voltage Condition I.000 Sensor Component Fullscale Voltage Condition I.000 Sensor Component Cell A Freq. Condition I.000 Status pass Sensor Component Cell A Freq. Condition I.05 ppb Status pass Sensor Component Cell A Flow Condition I.072 lpm Status pass Sensor Component Cell A Tmp. Condition I.072 lpm Status pass Sensor Component Cell A Tmp. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass Sensor Component Cell B Freq. Condition I.072 lpm Status pass	-				3.29				рро	Status		
Sensor Component Tree dewline >10m or below inlet  Sensor Component ADT <100 vehicles further than 20 Condition True Status pass  Sensor Component ADT >100 vehicles further than 50 Condition 340 m Status Fail  Sensor Component Sample Train Condition Good Status pass  Sensor Component Inlet Filter Condition Condition Clean Status pass  Sensor Component Offset Condition 0.8 Sensor Component Span Condition 1.013 Status pass  Sensor Component Zero Voltage Condition 0.0002 Status pass Sensor Component Cell A Freq. Condition 1.000 Status pass Sensor Component Cell A Noise Condition 0.72 lpm Status pass Sensor Component Cell A Tmp. Condition 36.9 C Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Noise Condition 0.72 lpm Status pass Sensor Component Cell B Flow Condition 0.72 lpm Status pass Sensor Component Cell B Flow Condition 0.72 lpm Status pass Sensor Component Cell B Flow Condition 0.72 lpm Status pass Sensor Component Cell B Flow Condition 0.72 lpm Status pass Sensor Component Cell B Flow Condition 0.72 lpm Status pass Sensor Component Cell B Flow Condition 0.72 lpm Status pass Sensor Component Cell B Flow Condition 0.72 lpm Status pass Sensor Component Cell B Flow Condition 0.72 lpm Status pass Sensor Component Cell B Flow Condition 0.72 lpm Status pass					tructed ru	le						
Sensor Component ADT <100 vehicles further than 20 Sensor Component ADT >100 vehicles further than 50 Condition 340 m Status Fail Sensor Component Sample Train Condition Good Status pass Sensor Component Inlet Filter Condition Condition 0.8 Sensor Component Offset Condition 0.8 Sensor Component Span Condition 1.013 Status pass Sensor Component Zero Voltage Condition 0.0002 Status pass Sensor Component Fullscale Voltage Condition 1.000 Status pass Sensor Component Cell A Freq. Condition 75.7 kHz Status pass Sensor Component Cell A Noise Condition 0.72 lpm Status pass Sensor Component Cell A Tmp. Condition 642.4 mmHg Status pass Sensor Component Cell B Freq. Condition 36.9 C Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Fressure Condition 0.72 lpm Status pass		_										
Sensor Component ADT >100 vehicles further than 50 Sensor Component Sample Train Condition Good Status pass Sensor Component Inlet Filter Condition Condition Clean Status pass Sensor Component Offset Condition 0.8 Status pass Sensor Component Span Condition 1.013 Status pass Sensor Component Zero Voltage Condition 0.0002 Status pass Sensor Component Fullscale Voltage Condition 1.000 Status pass Sensor Component Cell A Freq. Condition 75.7 kHz Status pass Sensor Component Cell A Noise Condition 0.72 lpm Status pass Sensor Component Cell A Tmp. Condition 36.9 C Status pass Sensor Component Cell B Freq. Condition 36.9 C Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass Sensor Component Cell B Freq. Condition 0.72 lpm Status pass		_										
Sensor ComponentSample TrainConditionGoodStatuspassSensor ComponentInlet Filter ConditionConditionCleanStatuspassSensor ComponentOffsetCondition0.8StatuspassSensor ComponentSpanCondition1.013StatuspassSensor ComponentZero VoltageCondition0.0002StatuspassSensor ComponentFullscale VoltageCondition1.000StatuspassSensor ComponentCell A Freq.Condition75.7 KHzStatuspassSensor ComponentCell A NoiseCondition0.5 ppbStatuspassSensor ComponentCell A FlowCondition0.72 lpmStatuspassSensor ComponentCell A PressureCondition642.4 mmHgStatuspassSensor ComponentCell B Freq.Condition36.9 CStatuspassSensor ComponentCell B Freq.Condition0.7 ppbStatuspassSensor ComponentCell B NoiseCondition0.72 lpmStatuspassSensor ComponentCell B FlowCondition0.72 lpmStatuspassSensor ComponentCell B PressureCondition642.5 mmHgStatuspass		•										
Sensor Component Inlet Filter Condition       Condition       Clean       Status       pass         Sensor Component Offset       Condition       0.8       Status       pass         Sensor Component Span       Condition       1.013       Status       pass         Sensor Component Zero Voltage       Condition       0.0002       Status       pass         Sensor Component Fullscale Voltage       Condition       1.000       Status       pass         Sensor Component Cell A Freq.       Condition       75.7 kHz       Status       pass         Sensor Component Cell A Noise       Condition       0.5 ppb       Status       pass         Sensor Component Cell A Flow       Condition       0.72 lpm       Status       pass         Sensor Component Cell A Tmp.       Condition       36.9 C       Status       pass         Sensor Component Cell B Freq.       Condition       0.7 ppb       Status       pass         Sensor Component Cell B Flow       Condition       0.72 lpm       Status       pass         Sensor Component Cell B Flow       Condition       642.5 mmHg       Status       pass		•			iuriner ir	ian 50						
Sensor Component       Offset       Condition       0.8       Status       pass         Sensor Component       Span       Condition       1.013       Status       pass         Sensor Component       Zero Voltage       Condition       0.0002       Status       pass         Sensor Component       Fullscale Voltage       Condition       1.000       Status       pass         Sensor Component       Cell A Freq.       Condition       0.5 ppb       Status       pass         Sensor Component       Cell A Flow       Condition       0.72 lpm       Status       pass         Sensor Component       Cell A Pressure       Condition       36.9 C       Status       pass         Sensor Component       Cell B Freq.       Condition       83.9 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.7 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       642.5 mmHg       Status       pass         Sensor Component       Cell B Pressure       Condition       642.5 mmHg       Status       pass		_										
Sensor Component       Span       Condition       1.013       Status       pass         Sensor Component       Zero Voltage       Condition       0.0002       Status       pass         Sensor Component       Fullscale Voltage       Condition       1.000       Status       pass         Sensor Component       Cell A Freq.       Condition       0.5 ppb       Status       pass         Sensor Component       Cell A Flow       Condition       0.72 lpm       Status       pass         Sensor Component       Cell A Pressure       Condition       642.4 mmHg       Status       pass         Sensor Component       Cell B Freq.       Condition       33.9 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.7 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.72 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       642.5 mmHg       Status       pass	Sensor C	ompone	Inlet Filter	Conditio	n		Condition	On Clean		Status	pass	
Sensor Component       Zero Voltage       Condition       0.0002       Status       pass         Sensor Component       Fullscale Voltage       Condition       1.000       Status       pass         Sensor Component       Cell A Freq.       Condition       0.5 ppb       Status       pass         Sensor Component       Cell A Flow       Condition       0.72 lpm       Status       pass         Sensor Component       Cell A Pressure       Condition       642.4 mmHg       Status       pass         Sensor Component       Cell B Freq.       Condition       36.9 C       Status       pass         Sensor Component       Cell B Freq.       Condition       0.7 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.72 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       642.5 mmHg       Status       pass	Sensor C	ompone	Offset				Condition	on 0.8		Status	pass	
Sensor ComponentFullscale VoltageCondition1.000StatuspassSensor ComponentCell A Freq.Condition75.7 kHzStatuspassSensor ComponentCell A NoiseCondition0.5 ppbStatuspassSensor ComponentCell A FlowCondition0.72 lpmStatuspassSensor ComponentCell A PressureCondition642.4 mmHgStatuspassSensor ComponentCell A Tmp.Condition36.9 CStatuspassSensor ComponentCell B Freq.Condition83.9 kHzStatuspassSensor ComponentCell B NoiseCondition0.7 ppbStatuspassSensor ComponentCell B FlowCondition0.72 lpmStatuspassSensor ComponentCell B PressureCondition642.5 mmHgStatuspass	Sensor C	ompone	Span				Condition	on 1.013		Status	pass	
Sensor Component       Cell A Freq.       Condition       75.7 kHz       Status       pass         Sensor Component       Cell A Noise       Condition       0.5 ppb       Status       pass         Sensor Component       Cell A Flow       Condition       0.72 lpm       Status       pass         Sensor Component       Cell A Pressure       Condition       642.4 mmHg       Status       pass         Sensor Component       Cell B Tmp.       Condition       36.9 C       Status       pass         Sensor Component       Cell B Freq.       Condition       83.9 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.7 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.72 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       642.5 mmHg       Status       pass	Sensor C	ompone	ent Zero Volta	ge			Condition	on 0.0002		Status	pass	
Sensor ComponentCell A NoiseCondition0.5 ppbStatuspassSensor ComponentCell A FlowCondition0.72 lpmStatuspassSensor ComponentCell A PressureCondition642.4 mmHgStatuspassSensor ComponentCell A Tmp.Condition36.9 CStatuspassSensor ComponentCell B Freq.Condition83.9 kHzStatuspassSensor ComponentCell B NoiseCondition0.7 ppbStatuspassSensor ComponentCell B FlowCondition0.72 lpmStatuspassSensor ComponentCell B PressureCondition642.5 mmHgStatuspass	Sensor C	ompone	Fullscale \	oltage/			Condition	on 1.000		Status	pass	
Sensor ComponentCell A FlowCondition0.72 lpmStatuspassSensor ComponentCell A PressureCondition642.4 mmHgStatuspassSensor ComponentCell A Tmp.Condition36.9 CStatuspassSensor ComponentCell B Freq.Condition83.9 kHzStatuspassSensor ComponentCell B NoiseCondition0.7 ppbStatuspassSensor ComponentCell B FlowCondition0.72 lpmStatuspassSensor ComponentCell B PressureCondition642.5 mmHgStatuspass	Sensor C	ompone	ent Cell A Free	٦.			Conditio	75.7 kHz		Status	pass	
Sensor ComponentCell A PressureCondition642.4 mmHgStatuspassSensor ComponentCell A Tmp.Condition36.9 CStatuspassSensor ComponentCell B Freq.Condition83.9 kHzStatuspassSensor ComponentCell B NoiseCondition0.7 ppbStatuspassSensor ComponentCell B FlowCondition0.72 lpmStatuspassSensor ComponentCell B PressureCondition642.5 mmHgStatuspass	Sensor C	ompone	ent Cell A Nois	se			Condition	on 0.5 ppb		Status	pass	
Sensor Component       Cell A Tmp.       Condition       36.9 C       Status       pass         Sensor Component       Cell B Freq.       Condition       83.9 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.7 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.72 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       642.5 mmHg       Status       pass	Sensor C	ompone	ent Cell A Flow	V			Condition	0.72 lpm		Status	pass	
Sensor Component       Cell B Freq.       Condition       83.9 kHz       Status pass         Sensor Component       Cell B Noise       Condition       0.7 ppb       Status pass         Sensor Component       Cell B Flow       Condition       0.72 lpm       Status pass         Sensor Component       Cell B Pressure       Condition       642.5 mmHg       Status pass	Sensor C	ompone	ent Cell A Pres	ssure			Condition	on 642.4 mmHg		Status	pass	
Sensor Component       Cell B Noise       Condition       0.7 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.72 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       642.5 mmHg       Status       pass	Sensor C	ompone	ent Cell A Tmp	).			Conditio	on 36.9 C		Status	pass	
Sensor Component       Cell B Flow       Condition       0.72 lpm       Status       pass         Sensor Component       Cell B Pressure       Condition       642.5 mmHg       Status       pass	Sensor C	ompone	ent Cell B Free	٦.			Condition	on 83.9 kHz		Status	pass	
Sensor Component Cell B Pressure Condition 642.5 mmHg Status pass	Sensor C	ompone	ent Cell B Nois	se			Condition	0.7 ppb		Status	pass	
Sensor Component Cell B Pressure Condition 642.5 mmHg Status pass	Sensor C	ompone	ent Cell B Flow	V						Status	pass	
	Sensor C	ompone	ent Cell B Pres	ssure			Condition	0n 642.5 mmHg		Status	pass	
Status pass	Sensor C	ompone	ent System Me	emo			Condition	on				

### 2 Meter Temperature Data Form Calc. Difference Serial Number Tag Site **Technician** Site Visit Date Parameter Mfg **Owner ID** ZIO433 Martin Valvur 05/17/2021 RM Young 15103 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** 0.25 0.28 UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Difference Test type Temp Low Rang 0.09 0.10 0.00000.33C 0.23 primary 21.58 21.59 0.0000 21.83 C 0.24 primary Temp Mid Range Temp High Rang primary 47.85 47.87 0.0000 48.15C 0.28 Sensor Component | Shield **Condition** Dirty Status Fail 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 Martin Valvur none ZIO433 05/17/2021 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** 0.31 0.44 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 26.19 26.20 0.00025.8 C -0.4426.60 26.61 C Temp Mid Range 0.00026.2 -0.41 primary C 27.06 27.08 0.000 27.2 0.07 primary Temp Mid Range Status pass Sensor Component System Memo Condition

## **Field Systems Comments**

1 Parameter: SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

2 Parameter: MetOpMaintCom

The inside of the temperature shield is dirty.

Field Systems Da	ata Form	]	F-02058-1500-S1-rev002
Site ID ZIO433	Technician Martin Valvur	Site Visit Date 05/1	7/2021
Site Sponsor (agency)	NPS	USGS Map	
<b>Operating Group</b>	NPS	Map Scale	
AQS#	49-053-0130	Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	QAPP Latitude	
<b>Deposition Measurement</b>		<b>QAPP</b> Longitude	
Land Use		<b>QAPP Elevation Meters</b>	
Terrain		<b>QAPP Declination</b>	
Conforms to MLM		<b>QAPP Declination Date</b>	
Site Telephone		Audit Latitude	37.198299
Site Address 1		Audit Longitude	-113.15072
Site Address 2		<b>Audit Elevation</b>	1266
County	Washington	<b>Audit Declination</b>	11.2
City, State	Virgin, UT	Present	
Zip Code	84779	Fire Extinguisher	
Time Zone	Mountain	First Aid Kit	
<b>Primary Operator</b>		Safety Glasses	
Primary Op. Phone #		Safety Hard Hat	
Primary Op. E-mail		Climbing Belt	
<b>Backup Operator</b>		Security Fence	
Backup Op. Phone #		Secure Shelter	
Backup Op. E-mail		Stable Entry Steps	
<b>Shelter Working Room</b> □	Make	odel	Shelter Size
Shelter Clean	Notes		
Site OK	Notes		
the no onto t	Hurricane UT drive north on state route 9 orth side of La Verkin, continuing on route he unpaved road named Dalton Wash. Taximately 1/4 mile past the locked gate and	<ol><li>Continue through Virgin. Oake the right fork at the orchard</li></ol>	nce through Virgin take the second left don Dalton Wash road. Continue

Fic	eld Systems Data Form	F-02058-1500-S3-rev002	
Site	ZIO433 Technician Martin Valvur		Site Visit Date 05/17/2021
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	<b>✓</b>	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)	<b>✓</b>	N/A
3	Are the tower and sensors plumb?	<b>✓</b>	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	<b>✓</b>	
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)	<b>✓</b>	
6	Is the solar radiation sensor plumb?	<b>✓</b>	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	<b>~</b>	N/A
8	Is the rain gauge plumb?	<b>✓</b>	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	<b>✓</b>	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A
11	Is it inclined approximately 30 degrees?	<b>✓</b>	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 ZIO433 Technician Martin Valvur	Site Visit Date 05/17/2021
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?	dirty
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 neces ral or man-made, that may affect the monitoring parameters:	essary) regarding conditions listed above, or any other features, s:
The i	nside of the temperature shield is dirty.	

Fi	eld Systems Data Form	F-02058-1500-S5-rev002	
Site	ZIO433 Technician Martin Valvur		Site Visit Date 05/17/2021
	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?	<b>✓</b>	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	<b>✓</b>	
	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?	<b>✓</b>	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		N/A
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	<b>✓</b>	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?	✓	No
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	N/A
Prov natu	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-S6-rev002 **Site ID** ZIO433 Technician Martin Valvur Site Visit Date 05/17/2021 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) No 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** 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 ZIO433 Technician | Martin Valvur Site Visit Date 05/17/2021 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 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** ~ **✓** 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** N/A **V V** Site Ops Manual **HASP** Not present Field Ops Manual **Calibration Reports ✓ V** Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ N/A **V** Are the Site Status Report Forms being completed and current? Are the chain-of-custody forms properly used to document **✓** N/A 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 ZIO433 Technician | Martin Valvur Site Visit Date 05/17/2021 Site ID Site operation procedures trained onsite by ARS 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? ✓ N/A 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** 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 V** Daily **Automatic Precision Level Tests V Manual Precision Level Test V Analyzer Diagnostics Tests ~ ✓** 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**

1	Do mult	i-point	calibr	ation gases g	o through	the comp	lete
	sample t	rain in	cludin	g all filters?			
•	D (				4.9		

- 2 Do automatic and manual z/s/p gasses go through the complete sample train including all filters?
- Are the automatic and manual z/s/p checks monitored and reported? If yes, how?

Unkno	own	
- Omaic	,	
7		
_		

Provide any additional 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-02058-15	500-89-rev002		
Sit	e ID ZIO433 Tec	hnician Martin Valvur		Site Visit Date	05/17/2021			
	Site operation procedures							
1	Is the filter pack being changed every	y Tuesday as scheduled?	<b>V</b>	N/A				
2	Are the Site Status Report Forms being completed and filed correctly?			N/A				
3	Are data downloads and backups being performed as scheduled?			No longer required				
4	Are general observations being made	e and recorded? How?	<b>✓</b>	Dataview				
5	5 Are site supplies on-hand and replenished in a timely fashion?							
6	Are sample flow rates recorded? How	v?	<b>✓</b>	N/A				
7	Are samples sent to the lab on a regularishion?	lar schedule in a timely	<b>✓</b>	N/A				
8	Are filters protected from contamina and shipping? How?	tion during handling	<b>✓</b>	N/A				
9	Are the site conditions reported reguloperations manager or staff?	larly to the field						
QC	<b>Check Performed</b>	Frequency			Compliant			
ľ	Multi-point MFC Calibrations	✓ N/A						
	Flow System Leak Checks							
	Filter Pack Inspection V/A							
	Flow Rate Setting Checks							
	Visual Check of Flow Rate Rotometer ✓ N/A							
I	In-line Filter Inspection/Replacement  M/A							
	Sample Line Check for Dirt/Water	N/A						
	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:							

Dry deposition samples are not collected at this CASTNET site.

## **Field Systems Data Form**

## F-02058-1500-S10-rev002

Site ID ZIO433 Technician Martin Valvur Site Visit Date 05/17/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906V0	none
DAS	Environmental Sys Corp	8816	4296	none
Modem	Sierra wireless	GX450	illegible	none
Ozone	ThermoElectron Inc	49C	49C-59348-322	90568
Ozone Standard	ThermoElectron Inc	49C	49C-70528-366	90728
Shelter Temperature	ARS	unknown	none	none
Temperature2meter	RM Young	41432VC	15103	none
Zero air pump	Werther International	PC 70/4	000706556	none

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SEK-	430-Martin	Valvur-05/21/2021				
1	5/21/2021	Computer	Hewlett Packard	none	ProBook	illegible
2	5/21/2021	DAS	Environmental Sys Corp	90649	8816	2562
3	5/21/2021	Elevation	Elevation	None	1	None
4	5/21/2021	Filter pack flow pump	Thomas	none	107CAB18	120000014367
5	5/21/2021	flow rate	Tylan	03384	FC280AV	AW9403014
6	5/21/2021	Infrastructure	Infrastructure	none	none	none
7	5/21/2021	Met tower	Aluma Tower	none	В	none
8	5/21/2021	MFC power supply	Tylan	03679	RO-32	FP9403015
9	5/21/2021	Modem	US Robotics	none	56k	unknown
10	5/21/2021	Ozone	ThermoElectron Inc	none	49i A3NCA	1200666538
11	5/21/2021	Ozone Standard	ThermoElectron Inc	90752	49C	49C-74532-376
12	5/21/2021	Shelter Temperature	ARS	none	none	none
13	5/21/2021	Shield (2 meter)	RM Young	none	Aspirated 43408	none
14	5/21/2021	Siting Criteria	Siting Criteria	None	1	None
15	5/21/2021	Temperature Translator	RM Young	00819	41406-X	063143
16	5/21/2021	Temperature2meter	RM Young	none	41342	8472
17	5/21/2021	Zero air pump	Werther International	none	C 70/4	000838301

#### **DAS Data Form** 0.2 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg **Environmental Sys** 2562 SEK430 Martin Valvur 05/21/2021 DAS Primary Das Date: 5 /21/2021 **Audit Date** 5 /21/2021 ΗY Parameter DAS Mfg 09:04:12 09:04:00 **Das Time: Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** 141 141 Das Day: **Audit Day** Tfer ID 01322 **Low Channel: High 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 15 0.0000 V -0.0009 -0.0006 0.0003 15 0.1000 0.0997 0.0999 V V 0.0002 15 0.3000 0.2995 0.2996 V V 0.0001V V 15 0.5000 0.4996 0.4999 0.0003 V 15 0.7000 V 0.00000.6996 0.6996 V V 15 0.9000 0.89980.8999 0.0001 15 1.0000 0.9995 0.9996 V V 0.0001

#### Flow Data Form **Technician Owner ID** Mfg **Serial Number Tag Site** Site Visit Date Parameter Martin Valvur flow rate 03384 Tylan AW9403014 SEK430 05/21/2021 Mfg BIOS Parameter Flow Rate Tylan Mfg 148613 Tfer Desc. BIOS 220-H **Serial Number** FP9403015 03679 **SN/Owner ID** 01421 Tfer ID MFC power supply Parameter: 0.00160 **Slope** 1.00850 Intercept 2/10/2021 0.99999 CorrCoff **Cert Date** 0.063 **DAS 1: DAS 2:** Cal Factor Zero 5.671 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 1.99% 2.10% 3.15 **Rotometer Reading:** Test type Input l/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignal PctDifference Desc. 0.000primary pump off 0.000-0.070.00000.02 1/ml/m leak check 0.000 -0.06 0.00000.02 1/ml/m0.000 primary 2.43 0.0000 1/m 2.10% test pt 1 2.977 2.950 3.01 1/mprimary 2.983 2.960 2.44 0.0000 3.01 1/m1.76% primary test pt 2 1/m0.00002.10% test pt 3 2.980 2.950 2.43 3.01 1/m1/mprimary Sensor Component Leak Test Condition Status pass Sensor Component Tubing Condition **Condition** Good Status pass Sensor Component Filter Position **Condition** Poor Status Fail 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 Status Fail **Sensor Component** Filter Depth Condition -1.0 cm

**Condition** 10 deg

Condition

**Sensor Component** Filter Azimuth

Sensor Component System Memo

Status pass

Status pass

## **Ozone Data Form**

Mfg	Serial Number	er Tag Site		Tech	nician	Site Visit Date	Paramet	ter	Owner ID
ThermoElectron Inc	1200666538	SEK430		Marti	in Valvur	05/21/2021	Ozone		none
•	0.98865 <b>Slo</b> p		0.0000	M	Ifg	ThermoElectron	Inc Par	rameter	ozone
		F-	0.00000	Se	erial Number	49CPS-70008-3	64 Tfe	er Desc.	Ozone primary stan
CorrCoff:	0.99999 Cor	rCoff:	0.0000	T	fer ID	01110			
DAS 1:	D	AS 2:		SI	lope	1.0034	0 Inter	cent	0.02230
A Avg % Diff: A M	1ax % Dif A	Avg %Diff A	Max % Dif		•			•	
0.0%	0.0%				ert Date	1/20/202	21 Corr	Coff	1.00000
UseDescription	ConcGroup	Tfer Raw	Tfer Co	rr	Site	Site Unit	RelPerI	Dif	AbsDif
primary	1	0.10	0.07		0.23	ppb			0.16
primary	2	16.04	15.88		15.55	ppb			-0.33
primary	3	37.11	36.76		36.13	ppb		-1.73	
primary	4	66.45	65.85		64.94	ppb		-1.39	
primary	5	116.89	115.86		114.60	ppb		-1.09	
Sensor Compone	Audit Press	ure	Conc	dition	718.5 mmHg		Status	pass	
Sensor Compone	26.6 degree	unobstructed ru	le Cond	dition	True		Status	pass	
Sensor Compone	ree dewlin	e >10m or below	inlet Cond	dition	True		Status	Pass	
Sensor Compone	ent ADT <100 v	ehicles further th	nan 20 Cond	dition	110 m		Status	fail	
Sensor Compone	ent ADT >100 v	ehicles further th	nan 50 Cond	dition	110 m		Status	fail	
Sensor Compone	Sample Tra	in	Conc	dition	Good		Status	pass	
Sensor Compone	nt Inlet Filter C	Condition	Conc	dition	Clean		Status	pass	
Sensor Compone	ont Offset		Conc	dition	0.000		Status	pass	
Sensor Compone	Span		Conc	dition	0.997		Status	pass	
Sensor Compone	nt Zero Voltag	е	Conc	dition	0.000		Status	pass	
Sensor Compone	nt Fullscale Vo	oltage	Conc	dition	0.9998		Status	pass	
Sensor Compone	cell A Freq.		Conc	dition	62.7 kHz		Status	pass	
Sensor Compone	cell A Noise	)	Conc	dition	0.8 ppb		Status	pass	
Sensor Compone	cell A Flow		Conc	dition	0.69 lpm		Status	pass	
Sensor Compone	cell A Press	sure	Conc	dition	696.7 mmHg		Status	pass	
Sensor Compone	Cell A Tmp.		Conc	dition	33.3 C		Status	pass	
Sensor Compone	cell B Freq.		Conc	dition	122.8 kHz		Status	pass	
Sensor Compone	Cell B Noise	)	Conc	dition	0.9 ppb		Status	pass	
Sensor Compone	Cell B Flow		Conc	dition	0.71 lpm		Status	pass	
Sensor Compone	cell B Press	sure	Conc	dition	696.4 mmHg		Status	pass	
Sensor Compone	System Mer	no	Conc	dition			Status	pass	

### 2 Meter Temperature Data Form Calc. Difference **Technician** Site Visit Date Parameter Mfg **Serial Number Tag Site Owner ID** 8472 SEK430 Martin Valvur 05/21/2021 RM Young Temperature2meter none Mfg Fluke Parameter Temperature RM Young Mfg 3275143 Tfer Desc. RTD **Serial Number** 063143 00819 **SN/Owner ID** 01229 Tfer ID Temperature Translator **Parameter: Slope** 0.99975 **Intercept** -0.00824 **DAS 1: DAS 2:** 2/9/2021 1.00000 CorrCoff Abs Avg Err Abs Max Err Abs Avg Err **Abs Max Err Cert Date** 0.06 0.07 Difference InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit UseDescription Test type 0.11 0.12 0.0000 0.16C 0.04 primary Temp Low Rang 21.81 21.82 0.0000 21.89 C 0.07 primary Temp Mid Range Temp High Rang primary 47.34 47.36 0.0000 47.29 C -0.07 Sensor Component | Shield **Condition** Clean Status pass Sensor Component Properly Sited **Condition** South **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 none SEK430 05/21/2021 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** 0.64 0.75 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 22.23 22.24 0.00022.7 $\mathbf{C}$ 0.44 21.20 21.21 21.9 C Temp Mid Range 0.0000.73 primary

0.000

21.59

Condition

21.58

primary

Temp Mid Range

Sensor Component System Memo

C

Status pass

0.75

22.3

## **Siting Criteria Form**

<b>Sensor Component</b>	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 40 m	Status	Fail
Sensor Component	System Memo	Condition	Status	pass
Sensor Component	Large parking lot	Condition	Status	pass

### **Infrastructure Data For**

Site ID SEK430 Technician Martin Valvur Site Visit Date 05/21/2021

Shelter Make	Shelter Model	Shelter Size
Alan pre-fab	s/n 861166 1808	512 cuft

<b>Sensor Component</b>	Sample Tower Type	Condition	Туре В	Status	pass
<b>Sensor Component</b>	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
<b>Sensor Component</b>	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
<b>Sensor Component</b>	System Memo	Condition		Status	pass

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazaı	rd Problem
Flow Rate	SEK430	Martin Valvur	05/21/2021	Filter Position	Tylan	1414		
The filter attachment nl	ate is mounted to	o low in the enclos	ure reculting in t	the filter being evn	osed to wind-d	riven rain and in the	ctandard	geometric

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

## **Field Systems Comments**

1 Parameter: SitingCriteriaCom

The site is a wooded area with spaced trees on three sides and a steep drop in elevation on the west side. Although not strictly conforming to siting criteria it is elevated in a wide valley and representative of the area. Trees are still within 5 meters, however none are higher than the CASTNET sample inlets.

2 Parameter: ShelterCleanNotes

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

3 Parameter: PollAnalyzerCom

The filter pack sample tubing has been spliced with tygon tubing about 5 meters above the ground. The tygon tubing is brown and deteriorating.

### **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 05/21/2021 SEK430 Technician | Martin Valvur Site ID Case Mountain **USGS Map** NPS **Site Sponsor (agency)** Map Scale NPS **Operating Group Map Date** 06-107-0009 AQS# R.M. Young **Meteorological Type** Ozone, IMPROVE, BAM Air Pollutant Analyzer **QAPP** Latitude dry **QAPP** Longitude **Deposition Measurement** woodland - mixed **Land Use QAPP Elevation Meters** Terrain complex **QAPP Declination** Marginally Conforms to MLM **OAPP Declination Date** 36.489469 **Site Telephone Audit Latitude** Southern Sierra Research Center -118.829153 Site Address 1 **Audit Longitude** Highway 198 Site Address 2 **Audit Elevation** 510 Tulare 13.1 **County Audit Declination** Sequoia National Park, CA City, State **Present** Fire Extinguisher 93262 Inspected March 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 s/n 861166 1808 Alan pre-fab **Shelter Size** 512 cuft **✓** Notes The shelter is aging but is in fair condition and kept clean, neat, and well organized. Shelter Clean

From highway 99 take 198 east through Three Rivers. Continue approximately 7 miles to the entrance to Sequoia

National Park. Less than one mile past the Fee both, take the first paved road to the right at the Southern Sierra

**✓** Notes

Research Center. The site is on the hill behind the center.

Site OK

**Driving Directions** 

### **Field Systems Data Form** F-02058-1500-S3-rev002 Technician Martin Valvur Site Visit Date 05/21/2021 Site ID SEK430 ✓ 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? 2 meter temperature shield pointing 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:

Fie	eld Systems Data Form		F-02058-1500-S4-rev002
Site	SEK430 Technician Martin Valvur		Site Visit Date 05/21/2021
1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	<b>✓</b>	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?	<b>✓</b>	
4	Are the aspirated motors working?	<b>✓</b>	
5	Is the solar radiation sensor's lens clean and free of scratches?	<b>✓</b>	N/A
6	Is the surface wetness sensor grid clean and undamaged?	<b>✓</b>	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?	<b>✓</b>	
	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,

## Field Systems Data Form F-02058-1500-S5-rev002 SEK430 Technician | Martin Valvur Site Visit Date 05/21/2021 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? Trees within 5 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? **V** Are the analyzers and monitors operational, on-line, and reporting data? Describe ozone sample tube. 1/4 teflon by 16 meters Describe dry dep sample tube. 3/8 teflon by 15 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? 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,

The filter pack sample tubing has been spliced with tygon tubing about 5 meters above the ground. The tygon tubing is brown and

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

deteriorating.

### Field Systems Data Form F-02058-1500-S6-rev002 SEK430 Technician | Martin Valvur Site Visit Date 05/21/2021 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) **✓** 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 The shelter ground may not be adequate grounded? **✓** Does the instrument shelter have a stable power source? **~** Is the instrument shelter temperature controlled? Grounded **Stable**

9 Is the met tower stable and grounded?

10 Is the sample tower stable and grounded?

11 Tower comments?

The met sensors are mounted on the sample tower.

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

### Field Systems Data Form F-02058-1500-S7-rev002 SEK430 Technician | Martin Valvur Site Visit Date 05/21/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No No N/A Yes **V** Wind speed sensor Data logger **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 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** DataView2 **SSRF ✓ V V V** Site Ops Manual Jan 2006 **HASP** Field Ops Manual **Calibration Reports V** Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ Dataview SSRFs are reviewed before sending 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 SEK430 Technician Martin Valvur Site Visit Date 05/21/2021 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 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** 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** As needed **✓** Alarm values only **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

**✓** 

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

**DataView** 

complete sample train including all filters?

reported? If yes, how?

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

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

Fi	eld Sy	stems Data Form			F-02058-1500-S9-rev002
Site	e ID	SEK430 Ted	chnician Martin Valvur		Site Visit Date 05/21/2021
	Site ope	ration procedures			
1	Is the fi	ter pack being changed ever	y Tuesday as scheduled?	<b>✓</b>	Filter changed morinings
2	Are the correctl	Site Status Report Forms be	ing completed and filed	<b>✓</b>	Flow and observation sections only
3	Are data	a downloads and backups beed?	ing performed as		No longer required
4	Are gen	eral observations being mad	e and recorded? How?	<b>✓</b>	SSRF
5	Are site fashion	supplies on-hand and replet	nished in a timely	<b>✓</b>	
6	Are san	ple flow rates recorded? Ho	w?	<b>✓</b>	SSRF
7	Are san	aples sent to the lab on a reg	ular schedule in a timely	<b>✓</b>	
8		ers protected from contamination	ation during handling	<b>✓</b>	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	<b>✓</b> Semiannually		✓
F	Flow Syst	em Leak Checks	✓ Weekly		<b>✓</b>
F	ilter Pac	k Inspection			
F	Flow Rate	Setting Checks	✓ Weekly		<b>⊻</b>
1	Visual Ch	eck of Flow Rate Rotometer	✓ Weekly		<b>⊻</b>
I	n-line Fil	ter Inspection/Replacement	✓ As needed		<b>⊻</b>
S	Sample Li	ne Check for Dirt/Water	✓ Weekly		✓
		dditional explanation (photo n-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

SEK430

Technician Martin Valvur

Site Visit Date 05/21/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	illegible	none
DAS	Environmental Sys Corp	8816	2562	90649
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	120000014367	none
flow rate	Tylan	FC280AV	AW9403014	03384
Infrastructure	Infrastructure	none	none	none
Met tower	Aluma Tower	В	none	none
MFC power supply	Tylan	RO-32	FP9403015	03679
Modem	US Robotics	56k	unknown	none
Ozone	ThermoElectron Inc	49i A3NCA	1200666538	none
Ozone Standard	ThermoElectron Inc	49C	49C-74532-376	90752
Shelter Temperature	ARS	none	none	none
Shield (2 meter)	RM Young	Aspirated 43408	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature Translator	RM Young	41406-X	063143	00819
Temperature2meter	RM Young	41342	8472	none
Zero air pump	Werther International	C 70/4	000838301	none

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ROM	[406-Marti	n Valvur-05/28/2021				
1	5/28/2021	Computer	Hewlett Packard	none	6560 b	SCB1520H6N
2	5/28/2021	DAS	Environmental Sys Corp	none	8864	C2601
3	5/28/2021	Elevation	Elevation	None	1	None
4	5/28/2021	flow rate	Tylan	03393	FC280AV	AW9403024
5	5/28/2021	Infrastructure	Infrastructure	none	none	none
6	5/28/2021	Met tower	Rohn	none	unknown	none
7	5/28/2021	MFC power supply	Tylan	none	RO-32	illegible
8	5/28/2021	Ozone	ThermoElectron Inc	none	49i A3NCA	1200666537
9	5/28/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460008
10	5/28/2021	Sample Tower	Aluma Tower	illegible	В	none
11	5/28/2021	Shelter Temperature	ARS	none	unknown	051
12	5/28/2021	Shield (2 meter)	RM Young	none	unknown	none
13	5/28/2021	Siting Criteria	Siting Criteria	None	1	None
14	5/28/2021	Temperature2meter	RM Young	none	41342	17079
15	5/28/2021	Zero air pump	Werther International	none	PC70/4	627675

#### **DAS Data Form** 8.0 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Environmental Sys C2601 ROM406 Martin Valvur 05/28/2021 DAS Primary Das Date: 5 /28/2021 **Audit Date** 5 /28/2021 ΗY Parameter DAS Mfg 08:44:12 08:45:00 **Das Time: Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** 148 Das Day: 148 **Audit Day** Tfer ID 01322 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0001 0.0002 0.0001 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 10 0.0000 V -0.0004 -0.0004 0.000010 0.1000 0.0999 0.1000 V V 0.0001 10 0.3000 0.2999 0.2999 V V 0.0000V V 10 0.5000 0.4995 0.4996 0.0001 V 10 0.7000 V -0.0002 0.7001 0.6999 V V 10 0.9000 0.89980.8996 -0.0002 10 1.0000 0.9998 0.9997 V V -0.0001

#### Flow Data Form **Technician Owner ID** Mfg **Serial Number Tag Site** Site Visit Date Parameter Martin Valvur flow rate 03393 Tylan AW9403024 ROM406 05/28/2021 Mfg BIOS Parameter Flow Rate Tylan Mfg 148613 Tfer Desc. BIOS 220-H **Serial Number** illegible none **SN/Owner ID** 01421 Tfer ID Parameter: MFC power supply 0.00160 **Slope** 1.00850 Intercept 2/10/2021 0.99999 CorrCoff **Cert Date** 0.012 **DAS 1: DAS 2:** Cal Factor Zero 5.602 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 2.64% 2.65% 4.2 **Rotometer Reading:** Test type Input l/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignal PctDifference Desc. primary pump off 0.0000.000-0.080.0000-0.031/ml/m leak check 0.000 -0.07 0.0000-0.02 1/ml/m0.000 primary 2.96 0.0000 2.99 1/m 2.61% test pt 1 2.939 2.910 1/mprimary 2.940 2.910 2.96 0.0000 2.99 1/m2.65% primary test pt 2 1/m2.96 0.00002.99 1/m2.65% test pt 3 2.937 2.910 1/mprimary Sensor Component Leak Test Condition Status pass Sensor Component Tubing Condition **Condition** Good Status pass Sensor Component Filter Position **Condition** Good Status pass Sensor Component Rotometer Condition 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 2.0 cm **Sensor Component** Filter Depth Status pass

Condition 350 deg

Condition

**Sensor Component** Filter Azimuth

Sensor Component System Memo

Status pass

Status pass

## **Ozone Data Form**

Mfg	S	Serial Numbe	er Tag Site		Technician S		Site Visit Date	Parame	eter	Owner ID
ThermoElec	tron Inc	1200666537	ROM40	16	Ma	artin Valvur	05/28/2021	Ozone		none
Slope:	0.	.99873 <b>Slop</b>	e:	0.00000		Mfg	ThermoElectron	Inc Pa	ramete	ozone
Intercept	0.	49411 Inte	rcept	0.00000		Serial Number	49CPS-70008-3	64 <b>Tf</b>	er Desc	Ozone primary stan
CorrCoff:	0.	.99999 Cor	rCoff:	0.00000		Tfer ID	01110			
DAS 1:		D	AS 2:			Slope	1.0034	10 Inter	.aant	0.02230
A Avg % D	iff: A Ma	ax % Dif A	Avg %Diff A	Max %	6 Dif	Stope			сері	
0.0	0%	0.0%				Cert Date	1/20/202	21 Corr	·Coff	1.00000
UseDescri	iption	ConcGroup	Tfer Raw	Tfe	er Corr	Site	Site Unit	RelPer	Dif	AbsDif
primai	ry	1	0.10	(	0.07	0.86	ppb			0.79
primai	ry	2	17.18	1	7.01	17.32	ppb			0.31
primai	ry	3	37.67	3	7.32	37.70	ppb		1.01	
primai	ry	4	67.58		6.97	67.11	ppb		0.21	
primai	ry	5	116.02	11	15.00	115.55	ppb		0.48	
Sensor C	omponen	Audit Pressi	ure		Condition	553.5 mmHg		Status	pass	
Sensor C	omponen	t 26.6 degree	unobstructed ru	ıle	Condition	7rue		Status	pass	
Sensor C	omponen	Tree dewline	e >10m or below	v inlet	Condition	<b>True</b>		Status	pass	
Sensor C	omponen	ADT <100 v	ehicles further t	han 20	Condition	70 m		Status	Fail	
Sensor C	omponen	ADT >100 v	ehicles further t	han 50	Condition	on 265 m		Status	Fail	
Sensor C	omponen	Sample Tra	in		Condition	Good		Status	pass	
Sensor C	omponen	t Inlet Filter C	condition		Conditio	Not tested		Status	pass	
Sensor C	omponen	Offset			Conditio	on -0.7		Status	pass	
Sensor C	omponen	Span			Condition	on 1.009		Status	pass	
Sensor C	omponen	Zero Voltag	е		Condition	0.0002		Status	pass	
Sensor C	omponen	t Fullscale Vo	ltage		Condition	1.0004		Status	pass	
Sensor C	omponen	t Cell A Freq.			Condition	94.9 kHz		Status	pass	
Sensor C	omponen	t Cell A Noise	)		Condition	1.2 ppb		Status	pass	
Sensor C	omponen	t Cell A Flow			Condition	0.57 lpm		Status	pass	
Sensor C	omponen	t Cell A Press	sure		Condition	539.9 mmHg		Status	pass	
Sensor C	omponen	t Cell A Tmp.			Condition	on 32.0 C		Status	pass	
Sensor C	omponen	t Cell B Freq.			Condition	<b>on</b> 80.1 kHz		Status	pass	
Sensor C	omponen	t Cell B Noise	)		Condition	0.5 ppb		Status	pass	
Sensor C	omponen	t Cell B Flow			Condition	0.57 lpm		Status	pass	
Sensor C	omponen	t Cell B Press	sure		Condition	539.9 mmHg		Status	pass	
Sensor C	omponen	System Mer	no		Condition	on		Status	pass	

### 2 Meter Temperature Data Form Calc. Difference Serial Number Tag Site **Technician** Site Visit Date Parameter Mfg **Owner ID** ROM406 Martin Valvur 05/28/2021 RM Young 17079 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** 0.28 0.32 UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Difference Test type Temp Low Rang 0.16 0.17 0.00000.38C 0.21 primary 22.47 22.48 0.0000 22.79 C 0.31 primary Temp Mid Range Temp High Rang 0.0000 0.32 primary 47.38 47.40 47.72 C Sensor Component | Shield **Condition** Clean Status pass Sensor Component Properly Sited **Condition** South **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 051 ROM406 Martin Valvur 05/28/2021 Shelter Temperature 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** 0.69 0.89 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	21.41	21.42	0.000	20.7	C	-0.76
primary	Temp Mid Range	20.20	20.21	0.000	20.6	С	0.42
primary	Temp Mid Range	19.82	19.83	0.000	20.7	C	0.89
Sensor Component System Memo			Condition		Status	pass	

# **Siting Criteria Form**

<b>Sensor Component</b>	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	ROM406	Technician	Martin Valvur	Site Visit Date	05/28/2021
---------	--------	------------	---------------	-----------------	------------

Shelter Make	Shelter Model	Shelter Size	
Ekto	8814 (s/n 3062-1)	896 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	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
<b>Sensor Component</b>	Shelter Floor	Condition	Good	Status	pass
<b>Sensor Component</b>	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: DasComments

Only RH, temperature, and AMoN are mounted on the meteorological tower at approximately 2 meters.

2 Parameter: ShelterCleanNotes

The shelter is clean, neat, organized, and well maintained.

3 Parameter: MetSensorComme

The recorded temperature is being measured at 2.5 meters above the ground and < 1 foot above the AMoN enclosure and facing south.

### **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 05/28/2021 ROM406 Technician | Martin Valvur Site ID Longs Peak **USGS Map** NPS Site Sponsor (agency) Map Scale NPS **Operating Group Map Date** 08-069-0007 AQS# R.M. Young **Meteorological Type** Ozone, IMPROVE 40.2778 Air Pollutant Analyzer **QAPP** Latitude dry **QAPP** Longitude -105.5453 **Deposition Measurement** woodland - mixed 2743 **Land Use QAPP Elevation Meters** Terrain complex **QAPP Declination** Marginally Conforms to MLM **OAPP Declination Date** (970) 586-8520 40.278129 **Site Telephone Audit Latitude** High Peak Camp -105.545635 Site Address 1 **Audit Longitude** Route 7 Site Address 2 **Audit Elevation** 2742 9.0 Larimer **County Audit Declination** Estes Park, CO City, State **Present** Fire Extinguisher 80517 Inspected June 2013 Zip Code Mountain **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 8814 (s/n 3062-1) Ekto **Shelter Size** 896 cuft **✓** Notes The shelter is clean, neat, organized, and well maintained. **Shelter Clean**

From Estes Park take route 7 south approximately 8.5 miles. Turn right onto Preservation Road (dirt road) at the sign

for High Peak Camp operated by the Salvation Army. The site is approximately 100 meters on the left.

**✓** Notes

Site OK

**Driving Directions** 

ROM406	Technician	Martin Valvur		
		iviaitiii vaivui		Site Visit Date 05/28/2021
I speed and direction s luenced by obstructio		as to avoid	<b>✓</b>	N/A
l sensors should be mo ally extended boom >2	ounted atop the Ex the max dian	tower or on a	<b>✓</b>	N/A
•			<b>✓</b>	N/A
				South
ns? (i.e. ground below and not steeply sloped.	sensors should Ridges, hollow	be natural	<b>✓</b>	
ar radiation sensor pl	umb?		<b>✓</b>	N/A
to avoid shading, or	any artificial or	reflected light?	<b>~</b>	N/A
n gauge plumb?			<b>✓</b>	N/A
	fects from buil	dings, trees,	<b>✓</b>	N/A
	ited with the gr	id surface	<b>✓</b>	N/A
ined approximately 30	degrees?		<b>✓</b>	N/A
	duenced by obstructional sensors mounted so all sensors should be more ally extended boom >2 to the prevailing wind gower and sensors pluratemperature shields perfectly and the prevailing wind gower and sensors pluratemperature and RH sensors? (i.e. ground below and not steeply sloped, water should be avoid ar radiation sensor plurate and sensor plurate	duenced by obstructions? It sensors mounted so as to minimize to sensors should be mounted atop the ally extended boom >2x the max diant to the prevailing wind) tower and sensors plumb?  The semperature shields pointed north or diated heat sources such as buildings, perature and RH sensors sited to avoid service. By sloped, Ridges, hollow water should be avoided)  The avoid shading, or any artificial or in gauge plumb?  It to avoid sheltering effects from building avoid sheltering effects from building.	It o avoid sheltering effects from buildings, trees, area wetness sensor sited with the grid surface borth?	It sensors mounted so as to minimize tower effects? It sensors should be mounted atop the tower or on a ally extended boom >2x the max diameter of the to the prevailing wind)  sower and sensors plumb?  It is a sources such as buildings, walls, etc?  perature and RH sensors sited to avoid unnatural and not steeply sloped. Ridges, hollows, and areas of water should be avoided)  It o avoid shading, or any artificial or reflected light?  It to avoid sheltering effects from buildings, trees, etc?  If a void sheltering effects from buildings, trees, etc?  If a void sheltering effects from buildings, trees, etc?

The recorded temperature is being measured at 2.5 meters above the ground and < 1 foot above the AMoN enclosure and facing south.

Fi	eld Systems Data Form	F-02058-1500-S4-rev002
Site	Technician Martin Valvur	Site Visit Date 05/28/2021
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:	ssary) regarding conditions listed above, or any other features, s:

Fi	eld Systems Data Form	F-02058-1500-S5-rev002	
Site	ROM406 Technician Martin Valvur		Site Visit Date 05/28/2021
	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?	<b>✓</b>	
2	Are the sample inlets 3 - 15 meters above the ground?	<b>✓</b>	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	<b>✓</b>	
	Pollutant analyzers and deposition equipment operations and	ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	<b>✓</b>	
2	Are the analyzers and monitors operational, on-line, and reporting data?	<b>✓</b>	
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)	<b>✓</b>	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?	<b>✓</b>	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	Clean and dry
	vide any additional explanation (photograph or sketch if necess aral 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 ROM406 Technician | Martin Valvur Site Visit Date 05/28/2021 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) 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:

Only RH, temperature, and AMoN are mounted on the meteorological tower at approximately 2 meters.

### Field Systems Data Form F-02058-1500-S7-rev002 ROM406 Technician | Martin Valvur Site Visit Date 05/28/2021 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 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 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** DataView2 **SSRF V ✓ V V** Site Ops Manual **HASP V V** 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? ✓ Dataview Flow and 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 ROM406 Technician Martin Valvur Site Visit Date 05/28/2021 Site ID Site operation procedures Trained by previous opertator 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** 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** Monthly and semiannually **V V Automatic Zero/Span Tests** Daily **V V** Every 2 weeks Manual Zero/Span Tests **V** Daily **Automatic Precision Level Tests V Manual Precision Level Test V Analyzer Diagnostics Tests ✓ ~** Every 2 weeks **In-line Filter Replacement (at inlet) V V** N/A In-line Filter Replacement (at analyze **V V** Sample Line Check for Dirt/Water Weekly **~ V** Semiannually **Zero Air Desiccant Check** Unknown Do multi-point calibration gases 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:

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?

reported? If yes, how?

**✓** 

**✓** 

Dataview

Fi	eld Sy	stems Data Form			F-02058-1500-S9-rev002				
Sit	e ID	ROM406 Te	chnician Martin Valvur		Site Visit Date	05/28/2021			
	Site ope	ration procedures							
1	Is the fi	ter pack being changed eve	ry Tuesday as scheduled?	<b>V</b>	Filter changed mornings				
2	Are the correctl	Site Status Report Forms b	eing completed and filed	<b>✓</b>					
3	Are data	a downloads and backups beed?	eing performed as		no longer required				
4	Are gen	eral observations being mad	le and recorded? How?	<b>✓</b>	SSRF				
5	Are site fashion	supplies on-hand and reple	nished in a timely	<b>✓</b>					
6	6 Are sample flow rates recorded? How?				SSRF				
7	Are sam	ples sent to the lab on a reg	ular schedule in a timely	<b>✓</b>					
8		ers protected from contamin oping? How?	ation during handling	<b>✓</b>	Clean gloves on and	d off			
9		site conditions reported reg ons manager or staff?	ularly to the field						
QC	Check P	erformed	Frequency			Compliant			
I	Multi-poi	nt MFC Calibrations	<b>✓</b> Semiannually			✓			
I	Flow Syst	em Leak Checks	<b>✓</b> Weekly			✓			
1	Filter Pack Inspection								
I	Flow Rate Setting Checks Weekly				✓				
1	Visual Check of Flow Rate Rotometer ✓ Weekly				✓				
1	n-line Fil	<b>✓</b> Semiannually			✓				
5	Sample Line Check for Dirt/Water ✓ Weekly					✓			
		dditional explanation (phot n-made, that may affect the			) regarding condition	ons listed above, or any other fe	atures,		

# **Field Systems Data Form**

## F-02058-1500-S10-rev002

Technician Martin Valvur Site ID ROM406

Site Visit Date 05/28/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	SCB1520H6N	none
DAS	Environmental Sys Corp	8864	C2601	none
Elevation	Elevation	1	None	None
flow rate	Tylan	FC280AV	AW9403024	03393
Infrastructure	Infrastructure	none	none	none
Met tower	Rohn	unknown	none	none
MFC power supply	Tylan	RO-32	illegible	none
Ozone	ThermoElectron Inc	49i A3NCA	1200666537	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	CM08460008	none
Sample Tower	Aluma Tower	В	none	illegible
Shelter Temperature	ARS	unknown	051	none
Shield (2 meter)	RM Young	unknown	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	17079	none
Zero air pump	Werther International	PC70/4	627675	none

# Site Inventory by Site Visit

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GTH	l 61-Martir	ı Valvur-06/01/2021				
1	6/1/2021	Computer	Dell	07055	Inspiron 15	834MC12
2	6/1/2021	DAS	Campbell	000416	CR3000	2513
3	6/1/2021	Elevation	Elevation	None	1	None
4	6/1/2021	Filter pack flow pump	Thomas	00517	107CAB18	100300020817
5	6/1/2021	Flow Rate	Apex	000558	AXMC105LPMDPCV	50735
6	6/1/2021	Infrastructure	Infrastructure	none	none	none
7	6/1/2021	Modem	Digi	07128	LR54	Illegible
8	6/1/2021	Ozone	ThermoElectron Inc	000617	49i A1NAA	1009241780
9	6/1/2021	Ozone Standard	ThermoElectron Inc	000208	49i A3NAA	0611416461
10	6/1/2021	Sample Tower	Aluma Tower	none	В	none
11	6/1/2021	Shelter Temperature	Campbell	none	107-L	none
12	6/1/2021	Siting Criteria	Siting Criteria	None	1	None
13	6/1/2021	Temperature	RM Young	06120	41342VC	11742
14	6/1/2021	Zero air pump	Werther International	06927	P 70/4	000836211

### **DAS Data Form** 0 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Primary Campbell 2513 GTH161 Martin Valvur 06/01/2021 DAS Das Date: 6 /1 /2021 **Audit Date** 6 /1 /2021 ΗY Parameter DAS Mfg 08:33:00 08:33:00 Das Time: **Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** Das Day: 152 **Audit Day** 152 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 **Cert Date** CorrCoff Channel Input DVM Output DAS Output InputUnit OutputUnit Difference 7 0.0000 V -0.0001 -0.0002 -0.0001 7 0.1000 0.0997 0.0999 V V 0.0002 7 0.3000 0.3017 0.3017 V V 0.0000V V 7 0.5000 0.4996 0.4997 0.0001 V 0.7000 V 0.00007 0.6997 0.6997 V V 0.9000 0.8996 0.8996 0.00007 1.0000 0.9993 0.9994 V V 0.0001

#### Flow Data Form **Technician Owner ID** Mfg **Serial Number Tag Site** Site Visit Date Parameter Martin Valvur 06/01/2021 000558 Apex 50735 GTH161 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** -0.01 **DAS 2: DAS 1:** Cal Factor Zero 0.99 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 1.69% 2.03% 3.9 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. primary pump off 0.000 0.0000.000.000-0.011/m1/mleak check 0.000 0.01 0.0000.00 1/ml/m0.000 primary 3.00 1/m 1.69% test pt 1 2.990 2.960 0.000 3.01 1/mprimary 2.980 2.950 3.01 0.000 3.01 1/m1/m2.03% primary test pt 2 3.01 0.0001.34% test pt 3 3.010 2.980 3.02 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 5.5 cm Status pass

Condition 1.5 cm

Condition 350 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 Numb	er Tag	Site		Te	chnician	Site Visit Date	Parame	eter	Owner ID
ThermoElec	ctron Inc	1009241780		GTH16	1	Ma	artin Valvur	06/01/2021	Ozone		000617
Slope: Intercept CorrCoff:			pe: ercept rrCoff:		0.0000	0	Mfg Serial Number	ThermoElectron			ozone c. Ozone primary stan
Correon.		0.00000	i Con.		0.0000	J	Tfer ID	01110			
DAS 1:		Γ	<b>AS 2:</b>				Slope	1.0034	40 Inter	rcept	0.02230
A Avg % D	oiff: A N	Max % Dif A	Avg %	Diff A	Max 9	% Dif	Cout Date	1/20/20	21 (	- CC - CC	1.00000
0.	0%	0.0%					Cert Date	1/20/20	21 Cori	Com	1.00000
UseDescr	iption	ConcGroup	Tfe	r Raw	Tf	er Corr	Site	Site Unit	RelPer	Dif	AbsDif
prima	ry	1	-(	).23		-0.25	-0.01	ppb			0.24
prima	ry	2	14	4.81		14.66	15.15	ppb			0.49
prima		3	3.5	5.05		34.72	34.98	ppb		0.75	
prima		4		5.25		64.66	65.62	ppb		1.47	
prima	•	5	_	6.30	_	15.28	118.10	ppb		2.42	
		ent Audit Press		0.50	1		on 545.5 mmHg	ppo	Status		
		ent 26.6 degre		tructed ru	ıle	Condition	True		Status	pass	
	_	ent Tree dewlin				Condition			Status		
	_	ent ADT <100							Status		
	•										
	•	ADT >100		iui iiiei ii	IAI1 50				Status		
	_	Sample Tra					Good		Status		
Sensor C	ompone	Inlet Filter	Conditio	n			On Clean		Status	pass	
Sensor C	ompone	Offset Offset				Condition	on -0.1		Status	pass	
Sensor C	ompone	ent Span				Condition	on 1.046		Status	pass	
Sensor C	ompone	Zero Volta	ge			Condition	on N/A		Status	pass	
Sensor C	ompone	Fullscale V	oltage			Condition	on N/A		Status	pass	
Sensor C	ompone	ent Cell A Fred	<b> </b> .			Condition	on 99.9 kHz		Status	pass	
Sensor C	ompone	ent Cell A Nois	e			Condition	0.8 ppb		Status	pass	
Sensor C	ompone	ent Cell A Flov	I			Condition	0.68 lpm		Status	pass	
Sensor C	ompone	ent Cell A Pres	ssure			Conditio	on 522.9 mmHg		Status	pass	
Sensor C	ompone	ent Cell A Tmp	).			Condition	31.3 C		Status	pass	
Sensor C	ompone	ent Cell B Fred	1.			Condition	99.8 kHz		Status	pass	
Sensor C	ompone	ent Cell B Nois	ie			Condition	0.4 ppb		Status	pass	
Sensor C	ompone	ent Cell B Flow	/				0.45 lpm		Status		
	_	ent Cell B Pres					on 522.3 mmHg		Status		
	•	ent System Me				Condition			Status		
	•										

### **Temperature Data Form** Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Martin Valvur RM Young 11742 GTH161 06/01/2021 Temperature 06120 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 0.09 0.15 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.06 0.07 0.0000.2 $\mathbf{C}$ 0.15 23.7 C Temp Mid Range 23.56 23.57 0.000 0.09 primary 47.53 47.55 0.000 C 0.04 primary Temp High Range 47.6 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** Martin Valvur 06/01/2021 Campbell none GTH161 Shelter Temperature 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** 0.37 1.09 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 20.49 20.50 0.00020.5 $\mathbf{C}$ 0.02

0.000

0.000

C

C

Status pass

1.09

0.01

19.7

25.0

18.61

24.97

Condition

18.60

24.96

Temp Mid Range

Temp Mid Range

Sensor Component System Memo

primary

primary

# **Siting Criteria Form**

<b>Sensor Component</b>	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 GTH161 Technician Martin Valvur Site Visit Date 06/01/2021

Shelter Make	Shelter Model	Shelter Size	
Ekto	8810 (s/n 2149-12)	640 cuft	

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

## **Field Systems Comments**

1 Parameter: ShelterCleanNotes

Some floor tiles are damaged.

2 Parameter: MetSensorComme

The temperature sensor has been moved to the sample tower and mounted in a naturally aspirated shield facing south and over the shelter roof. The met tower has been removed.

### **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 06/01/2021 GTH161 Technician | Martin Valvur Site ID Gothic **USGS Map EPA** Site Sponsor (agency) Map Scale RMBL **Operating Group Map Date** 08-051-9991 AQS# R.M. Young **Meteorological Type** 38.9573 Air Pollutant Analyzer Ozone **QAPP** Latitude dry, wet **QAPP** Longitude -106.9854 **Deposition Measurement** 2926 **Land Use** mountain meadow, woodland - mixed **QAPP Elevation Meters** 10.75 Terrain complex **QAPP Declination** No 2/23/2006 Conforms to MLM **OAPP Declination Date** (970) 349-5691 38.95627 **Site Telephone Audit Latitude** RMBL -106.98587 Site Address 1 **Audit Longitude** Gothic Site Address 2 **Audit Elevation** 2915 Gunnison 9.6 **County Audit Declination** Crested Butte, CO City, State **Present** Fire Extinguisher 81224 Inspected June 2019 Zip Code Mountain 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 (s/n 2149-12) Ekto **Shelter Size** 640 cuft **✓** Notes Some floor tiles are damaged. Shelter Clean **✓** Notes Site OK From Gunnison take route 135 north to Crested Butte. Continue through town to Mount Crested Butte. Continue **Driving Directions** through town past the fire station and the road maintenance facility onto the dirt road to Gothic. Continue

approximately three miles and park at the visitor area at the bottom of the hill below the site. The site is

approximately 200 meters on the path up the hill.

## **Field Systems Data Form** F-02058-1500-S3-rev002 Site Visit Date 06/01/2021 Technician Martin Valvur Site ID GTH161 ✓ 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? South Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc? Over shelter 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:

The temperature sensor has been moved to the sample tower and mounted in a naturally aspirated shield facing south and over the shelter

roof. The met tower has been removed.

	F-02058-1500-S4-rev002
Martin Valvur	Site Visit Date 06/01/2021
e intact, in good	Temperature only
al online, and	Temperature only
sensors clean?	
<b>~</b>	N/A
free of	N/A
undamaged?	N/A
t, in good	
ections protected	
or sketch if necessary) ring parameters:	regarding conditions listed above, or any other features,
	e intact, in good  al online, and  sensors clean?  free of  undamaged?  t, in good  ctions protected  or sketch if necessary)

Fi	eld Systems Data Form	F-02058-1500-S5-rev002	
Sit	GTH161 Technician Martin Valvur		Site Visit Date 06/01/2021
	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?	<b>✓</b>	
2	Are the sample inlets 3 - 15 meters above the ground?	<b>✓</b>	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	<b>✓</b>	
	Pollutant analyzers and deposition equipment operations and	mai	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	<b>✓</b>	
2	Are the analyzers and monitors operational, on-line, and reporting data?	<b>✓</b>	
3	Describe ozone sample tube.		1/4 teflon by 12 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)	<b>✓</b>	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	<b>✓</b>	
7	Is the zero air supply desiccant unsaturated?	<b>✓</b>	
8	Are there moisture traps in the sample lines?	<b>✓</b>	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	Clean and dry
	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 GTH161 Technician Martin Valvur Site Visit Date 06/01/2021 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? Is the sample tower stable and grounded? **V V** Tower does not have ground rod but is bolted to shelter. 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 GTH161 Technician | Martin Valvur Site Visit Date 06/01/2021 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 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 ~ **✓** 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 Oct 2001 **HASP V** Field Ops Manual July 1990 **Calibration Reports** 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 GTH161 Technician Martin Valvur Site Visit Date 06/01/2021 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 **~** 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** Manual Zero/Span Tests **✓ V** Daily **Automatic Precision Level Tests V V Manual Precision Level Test ✓ V** Weekly **Analyzer Diagnostics Tests ~** Every 2 weeks **In-line Filter Replacement (at inlet) V 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?

Are the automatic and manual z/s/p checks monitored and reported? If yes, how?

SSRF, call-in

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

Field Systems Data Form			F-02058-1500-S9-rev002				
Site ID GTH161 Tee	chnician Martin Valvur		Site Visit Date 06/01/2021				
Site operation procedures							
1 Is the filter pack being changed every Tuesday as scheduled?			Filter changed morinings				
2 Are the Site Status Report Forms being completed and filed correctly?							
3 Are data downloads and backups be scheduled?	ing performed as		No longer required				
4 Are general observations being mad	e and recorded? How?	<b>✓</b>	SSRF, logbook				
5 Are site supplies on-hand and replenished in a timely fashion?							
6 Are sample flow rates recorded? Ho	w?	<b>✓</b>	SSRF, call-in				
7 Are samples sent to the lab on a reg fashion?	ular schedule in a timely	<b>~</b>					
8 Are filters protected from contamin and shipping? How?	ation during handling	<b>✓</b>	Clean gloves on and off				
9 Are the site conditions reported regroperations manager or staff?	ularly to the field	<b>✓</b>					
QC Check Performed	Frequency		Compliant				
Multi-point MFC Calibrations	<b>✓</b> Semiannually		✓				
Flow System Leak Checks Weekly			✓				
Filter Pack Inspection							
Flow Rate Setting Checks	✓ Weekly		✓				
Visual Check of Flow Rate Rotometer			<u> </u>				
In-line Filter Inspection/Replacement	<b>✓</b> Semiannually		<u> </u>				
Sample Line Check for Dirt/Water	✓ Weekly		✓				
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-S10-rev002

Site ID GTH161 Technician Martin Valvur Site Visit Date 06/01/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	834MC12	07055
DAS	Campbell	CR3000	2513	000416
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	100300020817	00517
Flow Rate	Apex	AXMC105LPMDPC	50735	000558
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07128
Ozone	ThermoElectron Inc	49i A1NAA	1009241780	000617
Ozone Standard	ThermoElectron Inc	49i A3NAA	0611416461	000208
Sample Tower	Aluma Tower	В	none	none
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	11742	06120
Zero air pump	Werther International	P 70/4	000836211	06927

# Site Inventory by Site Visit

Site Vi	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
KNZ18	84-Martin	Valvur-06/08/2021				
1	6/8/2021	Computer	Dell	07014	Inspiron 15	313MC12
2	6/8/2021	DAS	Campbell	000361	CR3000	2139
3	6/8/2021	Elevation	Elevation	None	1	None
4	6/8/2021	Filter pack flow pump	Thomas	04855	107CAB18	060300020200
5	6/8/2021	Flow Rate	Apex	000849	AXMC105LPMDPCV	illegible
6	6/8/2021	Infrastructure	Infrastructure	none	none	none
7	6/8/2021	Modem	Digi	07182	LR54	Illegible
8	6/8/2021	Sample Tower	Aluma Tower	missing	В	none
9	6/8/2021	Shelter Temperature	Campbell	none	107-L	none
10	6/8/2021	Siting Criteria	Siting Criteria	None	1	None
11	6/8/2021	Temperature	RM Young	06541	41432VC	14082

#### **DAS Data Form** 0 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg 2139 Primary Campbell KNZ184 Martin Valvur 06/08/2021 DAS Das Date: 6 /8 /2021 **Audit Date** 6 /8 /2021 ΗY Parameter DAS Mfg 10:33:00 10:33:00 Das Time: **Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** 159 Das Day: 159 **Audit Day** Tfer ID 01322 **High Channel: Low Channel: Avg Diff: Max Diff: Avg Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0003 0.0003 0.0005 0.0005 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 -0.0005 -0.0008 -0.0003 7 0.1000 0.0995 0.0992 V V -0.0003 7 0.3000 0.2996 0.2993 V V -0.0003 V V 7 0.5000 0.4999 0.4994 -0.0005 V 0.7000 V -0.0001 7 0.6995 0.6994 V V 0.9000 0.9002 0.9005 0.00037 1.0000 1.0001 0.9996 V V -0.0005

#### Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter KNZ184 Martin Valvur 06/08/2021 000849 Apex illegible 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** -0.073 **DAS 2: DAS 1:** Cal Factor Zero 0.91 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 1.98% 1.98% 3.1 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. 1/mprimary pump off 0.000 0.0000.03 0.000-0.051/mleak check 0.000 0.000 0.01 0.000-0.06 1/ml/mprimary 3.10 2.97 1/m -1.98% test pt 1 3.053 3.030 0.000 1/mprimary 3.030 3.10 0.000 2.97 1/m1/m-1.98% primary test pt 2 3.058 3.10 0.0001/m-1.98% test pt 3 3.059 3.030 2.97 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 5.5 cm Status pass

Condition 2.5 cm

Condition 360 deg

Condition

Status pass

Status pass

Status pass

Sensor Component Filter Depth

**Sensor Component** Filter Azimuth

Sensor Component System Memo

### **Temperature Data Form** Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Martin Valvur RM Young 14082 KNZ184 06/08/2021 Temperature 06541 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 0.01 0.01 UseDesc. InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference Test type primary Temp Low Range 0.27 0.28 0.0000.3 $\mathbf{C}$ -0.01 C Temp Mid Range 23.49 23.50 0.000 23.5 primary 47.97 47.99 0.000 48.0 C primary Temp High Range -0.01 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 06/08/2021 Campbell none KNZ184 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** 0.33 0.79 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 27.82 27.84 0.00027.8 $\mathbf{C}$ 27.40 C 0.79

26.86

Condition

0.000

0.000

28.2

27.1

C

Status pass

0.21

Temp Mid Range

Temp Mid Range

Sensor Component System Memo

primary

primary

27.38

26.84

## **Siting Criteria Form**

<b>Sensor Component</b>	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 KNZ184 Technician Martin Valvur Site Visit Date 06/08/2021

Shelter Make	Shelter Model	Shelter Size
Wells Cargo	EW1211 (s/n 1WC200E1623048028)	640 cuft

Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Moisture Trap Type	Condition	Glass bottle and filter	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Poor	Status	Fail
Sensor Component	Shelter walls	Condition	Good	Status	pass
Sensor Component	Excessive mold present	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	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 located at a Long Term Ecological Research site operated by KSU.

2 Parameter: ShelterCleanNotes

The shelter is very clean, neat, well organized and well maintained. The shelter floor has deteriorated and is poor condition.

### **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 06/08/2021 KNZ184 Technician | Martin Valvur Site ID Swede Creek **USGS Map EPA Site Sponsor (agency)** Map Scale Kansas State University **Operating Group Map Date** 20-161-9991 AQS# R.M. Young **Meteorological Type** 39.1021 Air Pollutant Analyzer Ozone **QAPP** Latitude dry, wet **QAPP** Longitude -96.6096 **Deposition Measurement** 348 Land Use range **QAPP Elevation Meters** 4.5 gently rolling Terrain **QAPP Declination** 01/07/2005 Yes Conforms to MLM **OAPP Declination Date** (785) 770-8426 39.10216 **Site Telephone Audit Latitude** Konza Prairie Lane -96.609583 Site Address 1 **Audit Longitude** CR 901 Site Address 2 **Audit Elevation** 346 Riley 4.2 **County Audit Declination** Manhattan, KZ City, State **Present** Fire Extinguisher 66502 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 Secure Shelter** Backup Op. Phone # Stable Entry Steps Backup Op. E-mail **Shelter Working Room** ✓ **Make** Model EW1211 (s/n 1WC20 Wells Cargo **Shelter Size** 640 cuft **✓** Notes The shelter is very clean, neat, well organized and well maintained. The shelter floor has Shelter Clean deteriorated and is poor condition. **✓** Notes Site OK

From Manhattan take route 177 south. At the east edge of town, immediately after crossing the Kansas river, turn

right onto CR901 (McDowell Creek Road). Continue approximately 6.2 miles and turn left into the Konza Prairie

Biological Station. The site is through the gate and up the hill past the three-story stone farm house.

**Driving Directions** 

Fie	eld Sy	stems Data Fo			F-020	58-15	500-S3-	-rev002		
Site	e ID	KNZ184	Technician	Martin Valvur		Site Visit Date	06/08/2021			
1		d speed and direction s duenced by obstruction		as to avoid	<b>✓</b>	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	Are the t	tower and sensors plui	mb?		<b>✓</b>	N/A				
4		temperature shields po diated heat sources su			<b>✓</b>					
5	condition surface a	perature and RH sensons? (i.e. ground below and not steeply sloped, water should be avoid	sensors should Ridges, hollow	be natural	<b>✓</b>					
6	Is the so	lar radiation sensor pl	umb?		<b>✓</b>	N/A				
7	Is it sited	l to avoid shading, or	any artificial o	r reflected light?	<b>✓</b>	N/A				
8	Is the rai	in gauge plumb?			<b>✓</b>	N/A				
9	Is it sited towers, e	I to avoid sheltering efetc?	ffects from buil	dings, trees,	<b>✓</b>	N/A				
10	Is the sur	rface wetness sensor storth?	ited with the gr	id surface	<b>✓</b>	N/A				
11	Is it incl	ined approximately 30	degrees?		<b>✓</b>	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	KNZ184 Technician Martin Valvur		Site Visit Date 06/08/2021
1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	<b>✓</b>	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	<b>✓</b>	Temperature only
3	Are the shields for the temperature and RH sensors clean?	<b>✓</b>	
4	Are the aspirated motors working?	<b>✓</b>	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	<b>✓</b>	N/A
6	Is the surface wetness sensor grid clean and undamaged?	<b>✓</b>	N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	<b>✓</b>	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	<b>✓</b>	
	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			
Site ID KNZ184 Technician Martin Valvur			Site Visit Date 06/08/2021		
	Siting Criteria: Are the pollutant analyzers and deposition eq	uipr	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?	<b>✓</b>			
	Pollutant analyzers and deposition equipment operations and	ma	intenance		
1	Do the analyzers and equipment appear to be in good condition and well maintained?	<b>✓</b>	N/A		
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	N/A		
3	Describe ozone sample tube.		N/A		
4	Describe dry dep sample tube.		3/8 teflon by 12 meters		
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	<b>✓</b>	N/A		
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓			
7	Is the zero air supply desiccant unsaturated?	<b>✓</b>	N/A		
8	Are there moisture traps in the sample lines?	<b>✓</b>			
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	Clean and dry		
	Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:				

## Field Systems Data Form F-02058-1500-S6-rev002 **Site ID** KNZ184 Technician Martin Valvur Site Visit Date 06/08/2021 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) **✓** N/A 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 Systems Data Form F-02058-1500-S7-rev002 KNZ184 Technician | Martin Valvur Site Visit Date 06/08/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No No N/A Yes **V V** Wind speed sensor Data logger П **V V** Wind direction sensor Data logger **V 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 Humidity sensor translator Surge protector** П **V V UPS Solar radiation translator ~ V** Tipping bucket rain gauge **Lightning protection device** ~ **V** Shelter heater Ozone analyzer **V** $\checkmark$ 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 Oct 2001 **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 **✓** sample transfer to and from lab? **✓** N/A 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 KNZ184 Technician Martin Valvur Site Visit Date 06/08/2021 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 site 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** Semiannually **Multipoint Calibrations V V** Weekly **Visual Inspections V** N/A **Translator Zero/Span Tests (climatronics) ✓ V** N/A **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? **OC Check Performed** Compliant Frequency **Multi-point Calibrations V** N/A **V** N/A **Automatic Zero/Span Tests V** N/A Manual Zero/Span Tests **V** N/A **Automatic Precision Level Tests V** N/A **Manual Precision Level Test V** N/A **Analyzer Diagnostics Tests ~** N/A **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V** N/A Sample Line Check for Dirt/Water **~** N/A **Zero Air Desiccant Check ✓** N/A Do multi-point calibration gases 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:

N/A

✓ N/A

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?

reported? If yes, how?

Fi	eld Sy	stems Data Form				F-02058-15	00-S9-rev002
Site ID KNZ184 Technician Martin Valvur				Site Visit Date	e 06/08/2021		
	Site ope	ration procedures					
1	Is the filter pack being changed every Tuesday as scheduled?			<b>?</b>	Filter changed mo	rinings	
2	Are the correctl	Site Status Report Forms boy?	eing completed and filed	<b>✓</b>			
3	Are data	a downloads and backups beed?	ing performed as		No longer required		
4	Are gen	eral observations being mad	e and recorded? How?	✓	SSRF, logbook		
5	5 Are site supplies on-hand and replenished in a timely fashion?						
6	Are sample flow rates recorded? How?			<b>✓</b>	SSRF, call-in		
7	Are samples sent to the lab on a regular schedule in a timely fashion?			✓			
8	Are filters protected from contamination during handling and shipping? How?			<b>✓</b>	Clean gloves on a	nd off	
9	••			✓			
QC	Check P	erformed	Frequency			Compliant	
N	Aulti-poi	nt MFC Calibrations	<b>✓</b> Semiannually			$\checkmark$	
F			✓ Weekly			✓	
Filter Pack Inspection							
F	Flow Rate Setting Checks Weekly					✓	
1	Visual Check of Flow Rate Rotometer  Weekly					<b>✓</b>	
I	In-line Filter Inspection/Replacement  Weekly					✓	
S	Sample Line Check for Dirt/Water ✓ Weekly					$\checkmark$	
		dditional explanation (photon-made, that may affect the			) regarding condi	tions listed above, or an	y other features,

## **Field Systems Data Form**

## F-02058-1500-S10-rev002

Site ID KNZ184 Technician Martin Valvur Site Visit Date 06/08/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	313MC12	07014
DAS	Campbell	CR3000	2139	000361
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060300020200	04855
Flow Rate	Apex	AXMC105LPMDPC	illegible	000849
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	Illegible	07182
Sample Tower	Aluma Tower	В	none	missing
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41432VC	14082	06541

# Site Inventory by Site Visit

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number	
KIC00	KIC003-Martin Valvur-06/09/2021						
1	6/9/2021	DAS	Campbell	000816	CR850	28382	
2	6/9/2021	Filter pack flow pump	Permotec	none	BL30EB	unknown	
3	6/9/2021	Flow Rate	Apex	000668	AXMC105LPMDPCV	illegible	
4	6/9/2021	Modem	Sierra wireless	06996	unknown	unknown	
5	6/9/2021	Sample Tower	Aluma Tower	000814	В	none	
6	6/9/2021	Temperature	RM Young	06112	41342	10176	

### **DAS Data Form DAS Time Max Error:** 0 Mfg **Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Campbell 28382 KIC003 Martin Valvur 06/09/2021 DAS Primary Das Date: 6 /9 /2021 **Audit Date** 6 /9 /2021 ΗY Parameter DAS Mfg 07:47:00 07:47:00 **Das Time: Audit Time** 12010039329 Tfer Desc. Source generator (D **Serial Number** 160 160 Das Day: **Audit Day Tfer ID** 01322 **Low Channel: High Channel: Avg Diff: Avg Diff: Max Diff: Max Diff:** 1.00000 0.00000 **Slope** Intercept 0.0000 0.0000 0.0000 0.0000 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 **Cert Date** CorrCoff

#### Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter KIC003 Martin Valvur 06/09/2021 000668 Apex illegible 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** -0.012 **DAS 2: DAS 1:** Cal Factor Zero 0.9992 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 1.75% 2.29% **Rotometer Reading:** Desc. Test type Input l/m Input Corr MfcDisp. OutputSignal Output S E InputUnit OutputSignal PctDifference 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 3.00 0.000 2.99 1/m -1.64% test pt 1 3.070 3.040 1/mprimary 3.060 3.030 3.00 0.000 2.99 1/m1/m-1.32% primary test pt 2 3.00 0.0002.99 1/m-2.29% test pt 3 3.090 3.060 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 6.0 cm Status pass

Condition 1.5 cm

Condition 270 deg

Condition

Status pass

Status pass

Status pass

Sensor Component Filter Depth

**Sensor Component** Filter Azimuth

Sensor Component System Memo

### **Temperature Data Form** Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg KIC003 Martin Valvur RM Young 10176 06/09/2021 Temperature 06112 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 0.13 0.19 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.15 0.16 0.0000.0 $\mathbf{C}$ -0.19 23.75 C Temp Mid Range 23.76 0.000 23.6 -0.13 primary 48.64 48.66 0.000 C -0.07 primary Temp High Range 48.6 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**

## **Field Systems Comments**

1 Parameter: DocumentationCo

The site operator currently maintains records in a logbook provided by Wood.

2 Parameter: SitingCriteriaCom

The site is located across the street from the community school in the town of Powhattan.

3 Parameter: ShelterCleanNotes

Small footprint site with no shelter.

## F-02058-1500-S1-rev002 Field Systems Data Form KIC003 Technician | Martin Valvur Site Visit Date 06/09/2021 **Site ID USGS Map** EPA Site Sponsor (agency) Map Scale Kickapoo Tribe **Operating Group Map Date** AQS# R.M. Young **Meteorological Type Air Pollutant Analyzer QAPP** Latitude **Deposition Measurement QAPP** Longitude **Land Use QAPP Elevation Meters Terrain QAPP Declination OAPP Declination Date** Conforms to MLM 39.76102 **Site Telephone Audit Latitude** -95.63599 Site Address 1 **Audit Longitude** 367 Site Address 2 **Audit Elevation** Brown **Audit Declination County** City, State Powhattan, KS **Present** Fire Extinguisher 66527 **Zip Code ✓** Central 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 Secure Shelter** Backup Op. Phone # Stable Entry Steps Backup Op. E-mail Shelter Working Room Make Model **Shelter Size** □ Notes Small footprint site with no shelter. **Shelter Clean ✓** Notes Site OK

**Driving Directions** 

Fi	eld Sy	stems Data Fo	rm	F-02058-1500-S3-rev002		
Site	e ID	KIC003	Technician	Martin Valvur		Site Visit Date 06/09/2021
1		d speed and direction s fluenced by obstruction		as to avoid	<b>✓</b>	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 Ex the max dian	tower or on a	<b>✓</b>	N/A
3	Are the	tower and sensors plur	nb?		<b>✓</b>	N/A
4		temperature shields po diated heat sources suc			<b>✓</b>	
5	conditio surface	perature and RH sensons? (i.e. ground below and not steeply sloped. water should be avoic	sensors should Ridges, hollow	be natural	<b>✓</b>	
6	Is the so	lar radiation sensor pl	umb?		<b>✓</b>	N/A
7	Is it site	d to avoid shading, or a	any artificial or	reflected light?	<b>✓</b>	N/A
8	Is the ra	in gauge plumb?			<b>✓</b>	N/A
9	Is it sited towers,	d to avoid sheltering ef etc?	fects from buil	dings, trees,	✓	N/A
10	Is the su facing n	rface wetness sensor si orth?	ted with the gr	rid surface	<b>✓</b>	N/A
11	Is it inc	lined approximately 30	degrees?		<b>✓</b>	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	KIC003 Technician Martin Valvur	Site Visit Date 06/09/2021
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					
Site	KIC003 Technician Martin Valvur		Site Visit Date 06/09/2021					
	Siting Criteria: Are the pollutant analyzers and deposition eq	<u>uipı</u>	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?	<b>✓</b>						
2	Are the sample inlets 3 - 15 meters above the ground?	<b>✓</b>						
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	<b>✓</b>						
	Pollutant analyzers and deposition equipment operations and	ma	<u>intenance</u>					
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	N/A					
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	N/A					
3	Describe ozone sample tube.		N/A					
4	Describe dry dep sample tube.		3/8 teflon by 10 meters					
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	<b>✓</b>	N/A					
6	Are sample lines clean, free of kinks, moisture, and obstructions?	<b>✓</b>						
7	Is the zero air supply desiccant unsaturated?	✓	N/A					
8	Are there moisture traps in the sample lines?	<b>✓</b>						
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	Clean and dry					
	Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:							

## Field Systems Data Form F-02058-1500-S6-rev002 Site ID KIC003 Technician Martin Valvur Site Visit Date 06/09/2021 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) **✓** 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? **✓** N/A Is the instrument shelter temperature controlled? Grounded Stable Is the met tower stable and grounded?

**V** 

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

**V** 

Is the sample tower stable and grounded?

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

11 Tower comments?

#### Field Systems Data Form KIC003 Technician | Martin Valvur Site Visit Date 06/09/2021 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 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 **V 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 ✓ V** Site Ops Manual Feb 2014 **V HASP ✓** Feb 2014 Field Ops Manual **Calibration Reports** Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ 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? **✓** N/A Are ozone z/s/p control charts properly completed and current? Provide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features, natural or man-made, that may affect the monitoring parameters:

The site operator currently maintains records in a logbook provided by Wood.

F-02058-1500-S7-rev002

#### Field Systems Data Form F-02058-1500-S8-rev002 KIC003 Technician Martin Valvur Site Visit Date 06/09/2021 Site ID Site operation procedures trained on site by Wood 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** N/A **V** N/A **Automatic Zero/Span Tests V** N/A Manual Zero/Span Tests **V** N/A **Automatic Precision Level Tests V** N/A **Manual Precision Level Test V** N/A **Analyzer Diagnostics Tests ~** N/A **In-line Filter Replacement (at inlet) V** N/A In-line Filter Replacement (at analyze **V** N/A Sample Line Check for Dirt/Water **~** N/A **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?

<b>✓</b>	N/A
<b>V</b>	N/Δ

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:

Field Systems Data Form					F-02058-1500-89-rev002					
Site ID KIC003 Technician		hnician	Martin Valvur		Site Visit Date	06/09/2021				
	Site operation procedures									
1	Is the filter pack being changed every	y Tuesda	y as scheduled?	<b>✓</b>	Filter changed after	rnoons				
2	Are the Site Status Report Forms being completed and filed correctly?			<b>✓</b>						
3	Are data downloads and backups bei scheduled?	ing perfo	rmed as		No longer required					
4	Are general observations being made	e and reco	orded? How?	<b>✓</b>	SSRF, logbook, cal	ll-in				
5	5 Are site supplies on-hand and replenished in a timely fashion?			<b>✓</b>						
6	Are sample flow rates recorded? How	w?		<b>✓</b>	SSRF, logbook, call-in					
7	Are samples sent to the lab on a regulation?	ılar sched	ule in a timely	<b>✓</b>						
8	Are filters protected from contamina and shipping? How?	ition duri	ng handling	<b>✓</b>	Clean gloves on and off					
9	Are the site conditions reported regularizations manager or staff?	larly to t	he field	✓						
QC	Check Performed	Freq	uency			Compliant				
I	Multi-point MFC Calibrations	<b>✓</b> Semi	annually			<b>✓</b>				
]	Flow System Leak Checks	<b>✓</b> Week	dy			✓				
J	Filter Pack Inspection									
J	Flow Rate Setting Checks Weekly					✓				
•	Visual Check of Flow Rate Rotometer					✓				
]	In-line Filter Inspection/Replacement ✓ As needed					$\checkmark$				
5	Sample Line Check for Dirt/Water	<b>✓</b> Week	dy			$\checkmark$				
	vide any additional explanation (photo iral or man-made, that may affect the			sary	) regarding condit	ions listed above, or a	ny other features,			

## **Field Systems Data Form**

## F-02058-1500-S10-rev002

Site ID KIC003 Technician Martin Valvur Site Visit Date 06/09/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	28382	000816
Filter pack flow pump	Permotec	BL30EB	unknown	none
Flow Rate	Apex	AXMC105LPMDPC	illegible	000668
Modem	Sierra wireless	unknown	unknown	06996
Sample Tower	Aluma Tower	В	none	000814
Temperature	RM Young	41342	10176	06112

# Site Inventory by Site Visit

Site 1	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
WSP	144-Korey	Devins-06/12/2021				
1	6/12/2021	Computer	Dell	07037	Inspiron 15	Unknown
2	6/12/2021	DAS	Campbell	000430	CR3000	2525
3	6/12/2021	Elevation	Elevation	None	1	None
4	6/12/2021	Filter pack flow pump	Thomas	06021	107CAB18B	060400022648
5	6/12/2021	Flow Rate	Apex	000872	AXMC105LPMDPCV	illegible
6	6/12/2021	Infrastructure	Infrastructure	none	none	none
7	6/12/2021	Modem	Digi	07196	LR54	unknown
8	6/12/2021	Ozone	ThermoElectron Inc	000745	49i A1NAA	1105347310
9	6/12/2021	Ozone Standard	ThermoElectron Inc	000543	49i A3NAA	0929938240
10	6/12/2021	Sample Tower	Aluma Tower	000126	В	none
11	6/12/2021	Shelter Temperature	Campbell	none	107-L	none
12	6/12/2021	Siting Criteria	Siting Criteria	None	1	None
13	6/12/2021	Temperature	RM Young	06387	41342VC	13960
14	6/12/2021	Zero air pump	Werther International	06880	C 70/4	000814273

#### **DAS Data Form** 0 **DAS Time Max Error:** Mfg **Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Campbell 2525 WSP144 Korey Devins 06/12/2021 DAS Primary Das Date: 6 /12/2021 **Audit Date** 6 /12/2021 Fluke Parameter DAS Mfg 14:11:00 14:11:00 Das Time: **Audit Time** 95740135 Tfer Desc. DVM **Serial Number** 163 163 Das Day: **Audit Day** Tfer ID 01311 **Low Channel: High Channel: Avg Diff: Avg Diff: Max Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0000 0.0000 0.0001 0.0001 2/11/2021 1.00000 **Cert Date** CorrCoff Datel Parameter DAS Mfg **Serial Number** 15510194 Tfer Desc. Source generator (D 01320 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/13/2012 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 0.0999 0.0999 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 0.9991 V V -0.0001

#### Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter WSP144 Korey Devins 06/12/2021 000872 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** 0.01 **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** 0.22% 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 0.0000.00 0.0000.01 1/m1/mleak check 0.000 0.000 -0.02 0.000-0.01 1/ml/mprimary 1.48 0.000 1.50 1/m 0.00% test pt 1 1.493 1.500 1/mprimary 1.490 1.48 0.000 1.50 1/m1/m0.67% primary test pt 2 1.488 1.48 0.0001/m0.00% primary test pt 3 1.492 1.500 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 2.5 cm

Condition 210 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 Tag Site		Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347310	WSP14	4	Korey Devins	06/12/2021	Ozone	000745
•	1.00409 Slop 0.41434 Inte		0.00000	Mfg	ThermoElectron		
			0.00000	Serial Number		I fer Des	c. Ozone primary stan
		\ <u></u>		Tfer ID	01114		
<b>DAS 1:</b>	D	AS 2:		Slope	1.0003	0 Intercept	0.30550
A Avg % Diff: A N		Avg %Diff A	Max % Dif	Cert Date	1/20/202	1 CorrCoff	1.00000
0.0%	0.0%			Cert Date	1/20/202	Correon	1.00000
UseDescription	ConcGroup	Tfer Raw	Tfer Cor	r Site	Site Unit	RelPerDif	AbsDif
primary	1	0.33	0.02	-0.30	ppb		-0.32
primary	2	15.52	15.13	14.69	ppb		-0.44
primary	3	36.04	35.55	35.24	ppb	-0.88	
primary	4	67.31	66.66	66.54	ppb	-0.18	
primary	5	109.11	108.26	108.30	ppb	0.04	
Sensor Compone	Audit Press	ure	Cond	753 mmHg		Status pass	
Sensor Compone	ent 26.6 degree	unobstructed ru	le Cond	lition True		Status pass	
Sensor Compone	Tree dewlin	e >10m or below	inlet Cond	lition True		Status pass	
Sensor Compone	ent ADT <100 v	ehicles further th	nan 20 Cond	lition True		Status pass	
Sensor Compone	ent ADT >100 v	ehicles further th	nan 50 Cond	lition 265 m		Status Fail	
Sensor Compone	ent Sample Tra	in	Cond	lition Good		Status pass	
Sensor Compone	Inlet Filter C	Condition	Cond	lition Clean		Status pass	
Sensor Compone	ent Offset		Cond	lition 0.000		Status pass	
Sensor Compone	ent Span		Cond	lition 1.013		Status pass	
Sensor Compone	ent Zero Voltag	е	Cond	lition N/A		Status pass	
Sensor Compone	ent Fullscale Vo	oltage	Cond	lition N/A		Status pass	
Sensor Compone	ent Cell A Freq.		Cond	lition 88.4 kHz		Status pass	
Sensor Compone	Cell A Noise	Э	Cond	lition 0.5 ppb		Status pass	
Sensor Compone	Cell A Flow		Cond	lition 0.69 lpm		Status pass	
Sensor Compone	Cell A Press	sure	Cond	lition 732.4 mmHg		Status pass	
Sensor Compone	Cell A Tmp.		Cond	lition 38.5 C		Status pass	
Sensor Compone	Cell B Freq.		Cond	lition 92.0 kHz		Status pass	
Sensor Compone	Cell B Noise	9	Cond	lition 0.8 ppb		Status pass	
Sensor Compone	Cell B Flow		Cond	lition 0.72 lpm		Status pass	
Sensor Compone	ent Cell B Press	sure	Cond	lition 733.3 mmHg		Status pass	
Sensor Compone	System Mei	mo	Cond	lition		Status pass	

#### **Temperature Data Form** Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg WSP144 Korey Devins RM Young 13960 06/12/2021 Temperature 06387 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 0.11 0.31 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.23 0.01 0.0000.3 $\mathbf{C}$ 0.31 25.80 25.39 C Temp Mid Range 0.000 25.4 0.02 primary 45.09 0.000 C primary Temp High Range 45.64 45.1 -0.01 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** WSP144 Korey Devins Campbell none 06/12/2021 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** 0.86 0.99 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 29.37 28.94 0.00029.7 $\mathbf{C}$ 0.78

0.000

0.000

C

C

Status pass

0.8

0.99

30.1

27.3

29.32

26.30

Condition

29.75

26.71

Temp Mid Range

Temp Mid Range

Sensor Component System Memo

primary

primary

## **Siting Criteria Form**

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

### **Infrastructure Data For**

Site ID	WSP144	Technician	Korey Devins	Site Visit Date	06/12/2021
---------	--------	------------	--------------	-----------------	------------

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component Sample Tower Type	Condition Type B	Status pass	
Sensor Component Conduit	<b>Condition</b> N/A	Status pass	
Sensor Component Met Tower	<b>Condition</b> N/A	Status pass	
Sensor Component Moisture Trap	<b>Condition</b> Installed	Status pass	
Sensor Component Moisture Trap Type	Condition Glass bottle and	filter Status pass	
Sensor Component Power Cables	<b>Condition</b> Good	Status pass	
Sensor Component Shelter Temp Control	Condition Functioning	Status pass	
Sensor Component Rotometer	<b>Condition</b> 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	

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	WSP144	Korey Devins	06/12/2021	Moisture Present	Apex	4655		
The filter sample tubing has drops of moisture in low sections outside the shelter.								

## **Field Systems Comments**

1 Parameter: SiteOpsProcedures

Ozone sample line leak-checks are conducted every two weeks.

2 Parameter: SitingCriteriaCom

The city of Trenton, estimated population greater than 85,000, is within 20 km of the site.

3 Parameter: ShelterCleanNotes

The shelter is in fair condition, clean, very neat, and well organized but beginning to show signs of wear.

#### **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 06/12/2021 WSP144 Technician Korey Devins Site ID Pennington **USGS Map EPA Site Sponsor (agency)** Map Scale NJDEP / WCRC **Operating Group Map Date** 34-021-9991 AQS# R.M. Young **Meteorological Type** Air Pollutant Analyzer Ozone **QAPP** Latitude dry, PM2.5, PM10 **Deposition Measurement QAPP** Longitude Land Use woodland, urban agriculture **QAPP Elevation Meters** Terrain rolling **QAPP Declination** Marginally Conforms to MLM **OAPP Declination Date** 40.312303 **Site Telephone Audit Latitude** WCRC-FA -74.872663 Site Address 1 **Audit Longitude** Church Rd. Site Address 2 **Audit Elevation** 59 -12.5 Mercer **County Audit Declination** Titusville, NJ City, State **Present** Fire Extinguisher 08560 dated 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 **V 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 The shelter is in fair condition, clean, very neat, and well organized but beginning to show signs of Shelter Clean **✓** Notes Site OK

**Driving Directions** 

From Philadelphia take I-95 north. Cross the Delaware River into New Jersey and take the first exit, route 29 north, just over the bridge. Continue approximately 4 miles through the traffic light at the intersection of 546 and through the park. Turn right onto Church road at the traffic light. Continue approximately 0.5 miles to the gate for the WCRC-FA on the right. The combination to the lock is 1903. Continue through the gate up the gravel road to the top of the hill and turn right along the edge of the field. Follow the gravel road to the site in the chain-link fenced area.

Fic	eld Systems Data Form		F-02058-1500-S3-rev002
Site	WSP144 Technician Korey Devins		Site Visit Date 06/12/2021
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	<b>✓</b>	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)	<b>✓</b>	N/A
3	Are the tower and sensors plumb?	<b>✓</b>	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	<b>✓</b>	
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)	<b>✓</b>	
6	Is the solar radiation sensor plumb?	<b>✓</b>	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	<b>✓</b>	N/A
8	Is the rain gauge plumb?	<b>✓</b>	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	<b>✓</b>	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	<b>✓</b>	N/A
11	Is it inclined approximately 30 degrees?	<b>✓</b>	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?

Fie	eld Systems Data Form	F-02058-1500-S4-rev002
Site	WSP144 Technician Korey Devins	Site Visit Date 06/12/2021
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?	
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:	esary) regarding conditions listed above, or any other features,

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	WSP144 Technician Korey Devins		Site Visit Date 06/12/2021
	Siting Criteria: Are the pollutant analyzers and deposition eq	uipr	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?	<b>✓</b>	
2	Are the sample inlets 3 - 15 meters above the ground?	<b>✓</b>	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	<b>✓</b>	
	Pollutant analyzers and deposition equipment operations and	mai	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	<b>✓</b>	
2	Are the analyzers and monitors operational, on-line, and reporting data?	<b>✓</b>	
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)	<b>✓</b>	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	<b>✓</b>	Moisture in tubing only
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?	<b>✓</b>	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	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 ID WSP144 Technician Korey Devins Site Visit Date 06/12/2021 DAS sensor translators and peripheral equipment operations and maintenance

Site	W3F 144	recunician Roley L	Jevii is	Site visi	t Date   00/12/2021		
	DAS, sensor translators, and p	eripheral equipment o	perations an	d maintenar	<u>1ce</u>		
1	Do the DAS instruments appeared well maintained?	ar to be in good condit	ion and				
2	Are all the components of the modem, backup, etc)	DAS operational? (pri	nters,				
3	Do the analyzer and sensor sig lightning protection circuitry?		<b>V</b>	Temperature	only		
4	Are the signal connections prowell maintained?	tected from the weath	er and				
5	Are the signal leads connected	to the correct DAS ch	annel?				
6	Are the DAS, sensor translator grounded?	rs, and shelter properly	y				
7	Does the instrument shelter ha	ve a stable power sour	ce?				
8	Is the instrument shelter temp	erature controlled?	✓				
9	Is the met tower stable and gro	ounded?		Stable		Grounded	
10	Is the sample tower stable and	grounded?		<b>✓</b>		<b>✓</b>	
11	Tower comments?			Met tower rer	moved		
	vide any additional explanation ural or man-made, that may af			y) regarding	conditions listed a	above, or a	ny other features,

#### Field Systems Data Form F-02058-1500-S7-rev002 WSP144 Technician Korey Devins Site Visit Date 06/12/2021 Site ID **Documentation** Does the site have the required instrument and equipment manuals? N/A Yes No No N/A Yes **V** Wind speed sensor Data logger П **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 **✓ ✓** 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 Oct 2011 **V HASP ✓** Oct 2011 **V** Field Ops Manual **V Calibration Reports** 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 WSP144 Technician Korey Devins Site Visit Date 06/12/2021 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 **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** 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 **~ 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? ✓ SSRF, 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:

Ozone sample line leak-checks are conducted every two weeks.

FI	ela Sy	stems Data For	m			F-02058-1500-59-rev002			
Sit	e ID	WSP144	Technic	ian Korey Devins		Site Visit Date	06/12/2021		
	Site ope	eration procedures							
1	Is the fi	lter pack being changed o	every Tu	esday as scheduled	l? ✓	Filter changed after	noons		
2	2 Are the Site Status Report Forms being completed and filed correctly?								
3	•					No longer required			
4	Are gen	eral observations being r	nade and	l recorded? How?	<b>✓</b>	SSRF, logbook			
5	5 Are site supplies on-hand and replenished in a timely fashion?				<b>✓</b>				
6	Are san	nple flow rates recorded?	How?		<b>✓</b>	SSRF, logbook, call-in			
7	Are san	nples sent to the lab on a ?	regular s	chedule in a timely	y <b>•</b>				
8		ers protected from contar	nination	during handling	✓	Clean gloves on an	d off		
9		site conditions reported to ons manager or staff?	regularly	to the field	<b>✓</b>				
QC	Check P	erformed	]	Frequency			Compliant		
I	Multi-poi	nt MFC Calibrations	✓ (	Semiannually			✓		
]	Flow Syst	em Leak Checks	<b>✓</b> \	Weekly			✓		
]	Filter Pac	k Inspection	<b>✓</b> \	Weekly			✓		
]	Flow Rate Setting Checks Weekly					<b>✓</b>			
•	Visual Check of Flow Rate Rotometer				✓				
]	In-line Filter Inspection/Replacement				✓				
\$	Sample L	ine Check for Dirt/Water	. 🗸	Weekly			✓		
		additional explanation (plan-made, that may affect				r) regarding conditi	ons listed above, or a	ny other features,	

## **Field Systems Data Form**

## F-02058-1500-S10-rev002

Site ID WSP

WSP144 Technicia

Technician Korey Devins

Site Visit Date 06/12/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07037
DAS	Campbell	CR3000	2525	000430
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	060400022648	06021
Flow Rate	Apex	AXMC105LPMDPC	illegible	000872
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07196
Ozone	ThermoElectron Inc	49i A1NAA	1105347310	000745
Ozone Standard	ThermoElectron Inc	49i A3NAA	0929938240	000543
Sample Tower	Aluma Tower	В	none	000126
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	13960	06387
Zero air pump	Werther International	C 70/4	000814273	06880

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
VPI1	20-Korey l	Devins-06/14/2021				
1	6/14/2021	Computer	Dell	07032	Inspiron 15	Unknown
2	6/14/2021	DAS	Campbell	000402	CR3000	2514
3	6/14/2021	Elevation	Elevation	None	1	None
4	6/14/2021	Filter pack flow pump	Thomas	02751	107CAB18	1192001884
5	6/14/2021	Flow Rate	Apex	000591	AXMC105LPMDPCV	illegible
6	6/14/2021	Infrastructure	Infrastructure	none	none	none
7	6/14/2021	Modem	Digi	07209	LR54	unknown
8	6/14/2021	Ozone	ThermoElectron Inc	000690	49i A1NAA	1030244800
9	6/14/2021	Ozone Standard	ThermoElectron Inc	000328	49i A3NAA	0622717850
10	6/14/2021	Sample Tower	Aluma Tower	000828	В	AT-21407Z-2-7-3
11	6/14/2021	Shelter Temperature	Campbell	none	107-L	none
12	6/14/2021	Siting Criteria	Siting Criteria	None	1	None
13	6/14/2021	Temperature	RM Young	04318	41342	4037
14	6/14/2021	Zero air pump	Werther International	06929	C 70/4	000829173

#### **DAS Data Form** 0 **DAS Time Max Error: Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Mfg Campbell 2514 VPI120 Korey Devins 06/14/2021 DAS Primary Das Date: 6 /14/2021 **Audit Date** 6 /14/2021 Fluke Parameter DAS Mfg 14:04:15 14:04:15 Das Time: **Audit Time** 95740135 Tfer Desc. DVM **Serial Number** 165 165 Das Day: **Audit Day** Tfer ID 01311 **Low Channel: High Channel: Avg Diff: Avg Diff: Max Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0000 0.0000 0.0001 0.0001 2/11/2021 1.00000 **Cert Date** CorrCoff Datel Parameter DAS Mfg **Serial Number** 15510194 Tfer Desc. Source generator (D 01320 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/13/2012 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 0.1000 0.1000 V V 0.00007 0.3000 0.2997 0.2997 V V 0.00007 V V 0.5000 0.4996 0.4996 0.0000V 0.7000 V 0.00007 0.6995 0.6995 V V 0.9000 0.8994 0.8993 -0.0001 7 1.0000 0.9993 0.9992 V V -0.0001

#### Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter VPI120 Korey Devins 06/14/2021 000591 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 **DAS 2: DAS 1:** Cal Factor Zero 0.99 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 0.65% 0.65% 1.6 **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 0.00 0.0000.001/ml/mprimary 0.000 1/m -0.65% test pt 1 1.528 1.530 1.53 1.52 1/mprimary 1.530 1.53 0.000 1.52 1/m1/m-0.65% primary test pt 2 1.528 0.0001/m-0.65% primary test pt 3 1.528 1.530 1.53 1.52 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 6.0 cm Status pass Sensor Component Filter Depth Condition 0.5 cm Status pass Status pass **Sensor Component** Filter Azimuth Condition 45 deg Status pass Sensor Component System Memo Condition

## **Ozone Data Form**

Mfg		Serial Numb	er Tag	Site		Te	chnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElec	tron Inc	1030244800	١	VPI120		Ko	orey Devins	06/14/2021	Ozone		000690
Slope: Intercept CorrCoff:	-	0.40728 Int	pe: ercept rrCoff:		0.00000	)	Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114			ozone c. Ozone primary stan
DAS 1:		I	OAS 2:				Slope	1.0003	30 Inter	reant	0.30550
A Avg % D	iff: A N	Max % Dif A	Avg %	Diff A	Max 9	% Dif	•			-	
	0%	0.0%					Cert Date	1/20/202	21 Cori	·Coff	1.00000
UseDescr	iption	ConcGroup	Tfe	r Raw	Tf	er Corr	Site	Site Unit	RelPer	Dif	AbsDif
prima		1	C	.38		0.07	-0.23	ppb			-0.3
prima	•	2		5.19		14.81	14.47	ppb			-0.34
prima	•	3		5.08		34.60	33.76	ppb		-2.46	
prima	•	4		8.05		67.40	66.45	ppb		-1.42	
prima	•	5		2.59		11.72	110.86	ppb		-0.77	
-		ent Audit Pres		2.39			702 mmHg	рро	Status		
		ent 26.6 degre		tructed ri	مار	Condition			Status		
	_										
	_	Tree dewli				Condition			Status		
Sensor C	ompone	ADT <100	vehicles	further th	nan 20	Condition	on 165 m		Status	Fail	
Sensor C	ompone	ent ADT >100	vehicles	further tl	nan 50	Condition	on 165 m		Status	Fail	
Sensor C	ompone	ent Sample Tr	ain			Conditio	on Good		Status	pass	
Sensor C	ompone	ent Inlet Filter	Conditio	n		Condition	0n Clean		Status	pass	
Sensor C	ompone	ent Offset				Condition	0.000		Status	pass	
Sensor C	ompone	ent Span				Condition	on 0.998		Status	pass	
Sensor C	ompone	ent Zero Volta	ge			Condition	on N/A		Status	pass	
Sensor C	ompone	ent Fullscale \	/oltage			Condition	on N/A		Status	pass	
Sensor C	ompone	ent Cell A Free	٦.			Condition	0n 100.3 kHz		Status	pass	
Sensor C	ompone	ent Cell A Nois	se			Condition	0.8 ppb		Status	pass	
Sensor C	ompone	ent Cell A Flow	v			Condition	0.70 lpm		Status	pass	
Sensor C	ompone	ent Cell A Pres	ssure			Condition	673.2 mmHg		Status	pass	
Sensor C	ompone	ent Cell A Tmp	D.			Condition	37.7 C		Status	pass	
Sensor C	ompone	ent Cell B Free	٦.				88.3 kHz		Status		
Sensor C	ompone	ent Cell B Nois	se			Condition	0.6 ppb		Status	pass	
Sensor C	ompone	ent Cell B Flow	V				0.70 lpm		Status		
Sensor C	ompone	ent Cell B Pres	ssure				on 674.1 mmHg		Status		
	•	ent System Me				Condition			Status		
	Positi										

#### **Temperature Data Form** Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Korey Devins RM Young 4037 VPI120 06/14/2021 Temperature 04318 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 0.19 0.34 UseDesc. InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference Test type primary Temp Low Range 0.22 0.00 0.0000.3 $\mathbf{C}$ 0.34 25.8 C Temp Mid Range 26.21 25.80 0.000 -0.04 primary 46.25 45.69 0.000 45.9 C primary Temp High Range 0.18 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** VPI120 Korey Devins 06/14/2021 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** 0.17 0.31 01227 **Tfer ID** 1.00743 0.21666 **Slope** Intercept 2/18/2021 1.00000 CorrCoff**Cert Date**

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.84	27.42	0.000	27.1	C	-0.31
primary	Temp Mid Range	28.52	28.09	0.000	28.0	C	-0.13
primary	Temp Mid Range	28.99	28.56	0.000	28.6	C	0.07
Sensor Con	nponent System Memo	)	Condition		Status	pass	

## **Siting Criteria Form**

Sensor Component	imited agriculture operations	Condition 8 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	eedlot operations	Condition	Status	pass
Sensor Component	ntensive agriculture operations	Condition	Status	pass
Sensor Component	arge point source of So2 or Nox	Condition	Status	pass
Sensor Component	//Ajor highway, airport, or rail yard	Condition	Status	pass
Sensor Component	Najor 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	arge parking lot	Condition	Status	pass

## **Infrastructure Data For**

Site ID VPI120	Technician Korey Devins	Site Visit Date 06/14/2021	
----------------	-------------------------	----------------------------	--

Shelter Make	Shelter Model	Shelter Size	
Ekto	8810 (s/n 2107-3)	640 cuft	

		1			
<b>Sensor Component</b>	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	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

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazaro	Problem
Flow Rate	VPI120	Korey Devins	06/14/2021	Moisture Present	Apex	4140		

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

## **Field Systems Comments**

1 Parameter: SiteOKNotes

The site was moved to the new location approximately 8/10/2020. There is a significant elevation and land use change.

2 Parameter: ShelterCleanNotes

The shelter is clean, neat, and well organized. Floor tiles are loose and the paneling is deteriorating.

#### Field Systems Data Form F-02058-1500-S1-rev002 Site Visit Date 06/14/2021 VPI120 Technician Korey Devins Site ID **USGS Map** EPA Site Sponsor (agency) Map Scale VA Tech **Operating Group Map Date** 51-071-9992 AQS# R.M. Young **Meteorological Type** 37.3300 Air Pollutant Analyzer Ozone **QAPP** Latitude -80.5573 **Deposition Measurement** dry, wet **QAPP** Longitude Woodland - mixed 920 **Land Use QAPP Elevation Meters** 7.9 Terrain complex **QAPP Declination** 1/31/2007 Marginally Conforms to MLM **OAPP Declination Date** 37.323303 **Site Telephone Audit Latitude** 1567 Blue Grass Trail -80.45721 Site Address 1 **Audit Longitude** Site Address 2 Newport **Audit Elevation** 661 Giles -7.8 **County Audit Declination** Newport, VA City, State **Present** Fire Extinguisher 24128 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 2107-3) Ekto **Shelter Size** 640 cuft **✓** Notes The shelter is clean, neat, and well organized. Floor tiles are loose and the paneling is deteriorating. **Shelter Clean ✓** Notes Site OK The site was moved to the new location approximately 8/10/2020. There is a significant elevation and land use change.

The site was moved to the new location approximately 8/10/2020.

Driving directions are not available.

**Driving Directions** 

Fi	eld Systems Data Form		F-02058-1500-S3-rev002
Site	VPI120 Technician Korey Devins		Site Visit Date 06/14/2021
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	<b>✓</b>	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)	<b>✓</b>	N/A
3	Are the tower and sensors plumb?	<b>✓</b>	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	<b>✓</b>	
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)	<b>✓</b>	
6	Is the solar radiation sensor plumb?	<b>✓</b>	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	<b>✓</b>	N/A
8	Is the rain gauge plumb?	<b>✓</b>	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	<b>✓</b>	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	<b>✓</b>	N/A
11	Is it inclined approximately 30 degrees?	<b>V</b>	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	VPI120 Technician Korey Devins	Site Visit Date 06/14/2021
1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	✓ Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	Temperature only
3	Are the shields for the temperature and RH sensors clean?	✓ Moderately clean
4	Are the aspirated motors working?	✓ N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	✓ N/A
6	Is the surface wetness sensor grid clean and undamaged?	✓ N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	
	ride any additional explanation (photograph or sketch if necess ral or man-made, that may affect the monitoring parameters:	esary) regarding conditions listed above, or any other features,

F1(	ld Systems Data Form		F-02058-1500-S5-rev002
Site	ID VPI120 Technician Korey Devins		Site Visit Date 06/14/2021
	Siting Criteria: Are the pollutant analyzers and deposition e	quipr	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?	<b>✓</b>	
2	Are the sample inlets 3 - 15 meters above the ground?	<b>✓</b>	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	<b>✓</b>	
	Pollutant analyzers and deposition equipment operations and	d ma	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	<b>✓</b>	
2	Are the analyzers and monitors operational, on-line, and reporting data?	<b>✓</b>	
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)	<b>✓</b>	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	
7	Is the zero air supply desiccant unsaturated?	<b>✓</b>	
8	Are there moisture traps in the sample lines?	<b>✓</b>	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	Clean and dry
	de 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,

## Field Systems Data Form F-02058-1500-S6-rev002 VPI120 Site ID Technician Korey Devins Site Visit Date 06/14/2021 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? 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 VPI120 Technician Korey Devins Site Visit Date 06/14/2021 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 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 UPS Solar radiation translator ~ V** Tipping bucket rain gauge **Lightning protection device** ~ **✓** 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 V SSRF ✓ V ✓ V** Site Ops Manual Oct 2018 **V HASP ✓** Oct 2018 **✓** Field Ops Manual Oct 2018 **V 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 VPI120 Technician Korey Devins Site Visit Date 06/14/2021 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 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 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** Do multi-point calibration gases go through the complete

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
<b>✓</b>	
<b>✓</b>	logbook, call-in

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

Field Systems Data Form						F-02058-1500-S9-rev002				
Site ID VPI120 Technic				Korey Devins		Site Visit Date	e 06/14/2021			
	Site ope	ration procedures								
1	Is the fil	ter pack being changed e	very Tueso	lay as scheduled	<b>V</b>	Filter changed mo	rinings			
2	Are the correctly	Site Status Report Forms y?	being con	pleted and filed	<b>✓</b>					
3	Are data	a downloads and backups	being per	formed as		No longer required	Ĺ			
4	Are gen	eral observations being m	ade and r	ecorded? How?	✓	SSRF, logbook				
5	Are site fashion?	supplies on-hand and rep	lenished i	n a timely	✓					
6	Are sam	ple flow rates recorded?	How?		<b>✓</b>	SSRF, logbook, call-in				
7	Are sam	ples sent to the lab on a r	egular sch	edule in a timely	✓					
8		ers protected from contamoping? How?	ination du	ıring handling	<b>✓</b>	Clean gloves on and off				
9		site conditions reported rons manager or staff?	egularly to	the field	✓					
QC	Check Po	erformed	Fre	equency			Compliant			
I	Multi-poii	nt MFC Calibrations	<b>✓</b> Se	miannually			✓			
1	Flow Syste	em Leak Checks	<b>✓</b> We	ekly		✓				
Filter Pack Inspection										
I	Flow Rate Setting Checks Weekly				✓					
•	Visual Check of Flow Rate Rotometer  Weekly			✓						
I	In-line Filter Inspection/Replacement  Semiannually			✓						
5	Sample Li	ne Check for Dirt/Water								
		dditional explanation (ph n-made, that may affect t				) regarding condi	tions listed above, o	r any other features,		

# **Field Systems Data Form**

## F-02058-1500-S10-rev002

Site ID VPI120 Technician Korey Devins Site Visit Date 06/14/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07032
DAS	Campbell	CR3000	2514	000402
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	1192001884	02751
Flow Rate	Apex	AXMC105LPMDPC	illegible	000591
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07209
Ozone	ThermoElectron Inc	49i A1NAA	1030244800	000690
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717850	000328
Sample Tower	Aluma Tower	В	AT-21407Z-2-7-3	000828
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4037	04318
Zero air pump	Werther International	C 70/4	000829173	06929

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number				
SHN418-Korey Devins-06/15/2021										
1	6/15/2021	Computer	Hewlett Packard	none	8470p	351B4FP				
2	6/15/2021	DAS	Environmental Sys Corp	90658	8816	2643				
3	6/15/2021	Elevation	Elevation	None	1	None				
4	6/15/2021	Filter pack flow pump	Thomas	00443	107CA110	0288714888				
5	6/15/2021	flow rate	Tylan	03942	FC280	AW9605202				
6	6/15/2021	Infrastructure	Infrastructure	none	none	none				
7	6/15/2021	MFC power supply	Tylan	03485	RO-32	FP9404009				
8	6/15/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	0903334535				
9	6/15/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745083				
10	6/15/2021	Sample Tower	Aluma Tower	923307	В	none				
11	6/15/2021	Shelter Temperature	ARS	none	none	none				
12	6/15/2021	Siting Criteria	Siting Criteria	None	1	None				
13	6/15/2021	Temperature2meter	RM Young	none	41342VC	14265				
14	6/15/2021	Zero air pump	Werther International	none	C 70/4	000855578				



#### Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter Korey Devins 06/15/2021 flow rate 03942 Tylan AW9605202 SHN418 Mfg BIOS Parameter Flow Rate Tylan Mfg 131818 Tfer Desc. BIOS 220-H **Serial Number** FP9404009 03485 **SN/Owner ID** 01417 Tfer ID MFC power supply **Parameter:** -0.00058 **Slope** 0.99756 **Intercept** 2/10/2021 0.99993 CorrCoff **Cert Date** -0.343 **DAS 1: DAS 2:** Cal Factor Zero 5.008 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 3.70% 3.96% 1.7 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Test type Input l/m Input Corr MfcDisp. Desc. primary pump off 0.000 0.0000.29 0.0000-0.011/ml/m leak check 0.000 0.000 0.32 0.00000.25 1/ml/mprimary 0.0000 1/m 3.96% test pt 1 1.441 1.440 1.71 1.50 1/mprimary 1.440 1.440 1.71 0.0000 1.50 1/m1/m3.89% primary test pt 2 0.0000l/m3.24% test pt 3 1.443 1.450 1.71 1.50 1/mprimary Condition 0.25 lpm Status Fail Sensor Component Leak Test Sensor Component Tubing Condition Status pass **Condition** Good Sensor Component Filter Position **Condition** Fair 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 Sensor Component Filter Depth Condition 0.0 cm Status pass

Condition 315 deg

Condition

**Sensor Component** Filter Azimuth

Sensor Component System Memo

Status pass

Status pass

## **Ozone Data Form**

Mfg	S	erial Numbe	er Tag Site		Te	chnician	Site Visit Date	Paramet	ter	Owner ID
ThermoElec	tron Inc	0903334535	SHN41	18	Ko	orey Devins	06/15/2021	Ozone		none
Slope:	0.	99057 <b>Slop</b>	<b>16.</b>	0.00000	)	Mfg	ThermoElectron	Inc Par	rameter	ozone
Intercept		-	rcept	0.00000	-	Serial Number	1180030022	Tfe	r Desc	Ozone primary stan
CorrCoff:	1.		rCoff:	0.00000	)			110	i Desc.	Ozono primary otari
						Tfer ID	01114			
<b>DAS 1:</b>		D	AS 2:			Slope	1.0003	0 Inter	cept	0.30550
			Avg %Diff	A Max %	% Dif	Cert Date	1/20/202	21 Corr	Coff	1.00000
0.0	0%	0.0%				Cert Date	1/20/202	- Corre	Con	1.00000
UseDescri	iption (	ConcGroup	Tfer Raw	Tfe	er Corr	Site	Site Unit	RelPerI	Oif	AbsDif
primai	ry	1	0.37		0.06	-0.04	ppb			-0.1
primai	•	2	14.74		4.36	13.98	ppb			-0.38
primai	•	3	34.59		34.11	33.74	ppb		-1.09	
primai	ry	4	66.62		55.98	65.35	ppb		-0.96	
primai	ry	5	111.30	1	10.43	109.20	ppb		-1.12	
Sensor C	omponent	Audit Pressi	ure		Condition	on 669.5 mmHg		Status	pass	
Sensor Co	omponent	26.6 degree	unobstructed r	ule	Condition	On True		Status	pass	
Sensor C	omponent	Tree dewline	e >10m or belo	w inlet	Conditi	on True		Status	pass	
Sensor Co	omponent	ADT <100 v	ehicles further	than 20	Conditi	<b>100</b> m		Status	Fail	
Sensor Co	omponent	ADT >100 v	ehicles further	than 50	Conditi	on 202 m		Status	Fail	
Sensor Co	omponent	Sample Tra	in		Conditi	Good		Status	pass	
Sensor Co	omponent	Inlet Filter C	Condition		Conditi	On Clean		Status	pass	
Sensor Co	omponent	Offset			Conditi	on 0.1		Status	pass	
Sensor Co	omponent	Span			Conditi	on 1.004		Status	pass	
Sensor Co	omponent	Zero Voltag	е		Conditi	on N/A		Status	pass	
Sensor Co	omponent	Fullscale Vo	oltage		Conditi	on N/A		Status	pass	
Sensor Co	omponent	Cell A Freq.			Conditi	on 89.3 kHz		Status	pass	
Sensor Co	omponent	Cell A Noise	)		Condition	0.6 ppb		Status	pass	
Sensor Co	omponent	Cell A Flow			Condition	0.72 lpm		Status	pass	
Sensor Co	omponent	Cell A Press	sure		Conditi	on 658.9 mmHg		Status	pass	
Sensor Co	omponent	Cell A Tmp.			Conditi	35.0 C		Status	pass	
Sensor Co	omponent	Cell B Freq.			Conditi	on 134.6 kHz		Status	pass	
Sensor Co	omponent	Cell B Noise	)		Conditi	0n 1.5 ppb		Status	pass	
Sensor Co	omponent	Cell B Flow			Conditi	0.71 lpm		Status	pass	
Sensor Co	omponent	Cell B Press	sure		Conditi	<b>0n</b> 660.0 mmHg		Status	pass	
Sensor Co	omponent	System Mer	no		Conditi	on		Status	pass	

## 2 Meter Temperature Data Form Calc. Difference Serial Number Tag Site **Technician** Site Visit Date Parameter Mfg **Owner ID** SHN418 Korey Devins 06/15/2021 Temperature2meter RM Young 14265 none Mfg Extech Parameter Temperature H232734 Tfer Desc. RTD **Serial Number** 01227 Tfer ID **Slope** 1.00743 **Intercept** 0.21666 **DAS 1: DAS 2: Cert Date** 2/18/2021 1.00000 Abs Avg Err Abs Max Err Abs Avg Err Abs Max Err CorrCoff 0.1 0.14 Difference UseDescription InputTmpRaw InputTmpCorrected | OutputTmpSignal | OutputSignalEng | OSE Unit Test type primary Temp Low Rang 0.18 -0.04 0.0000 $0.02 \, \rm C$ 0.06 26.16 25.75 0.0000 25.85 C 0.1 primary Temp Mid Range Temp High Rang 0.14 primary 46.01 45.46 0.0000 45.60 C Sensor Component | Shield Condition Moderately clean Status pass Sensor Component Properly Sited **Condition** Properly sited Status pass Sensor Component Blower **Condition** Functioning Status pass Sensor Component System Memo Status pass **Condition**

### **Shelter Temperature Data For** Mfg Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** ARS Korey Devins 06/15/2021 none SHN418 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** 0.79 0.81 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 26.38 25.97 0.00026.8 $\mathbf{C}$ 0.78 25.96 C Temp Mid Range 26.37 0.00026.7 0.77 primary C 26.44 26.03 0.000 26.8 0.81 primary Temp Mid Range Status pass Sensor Component System Memo Condition

# **Siting Criteria Form**

<b>Sensor Component</b>	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	SHN418	Technician	Korey Devins	Site Visit Date	06/15/2021
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Shelter Make	Shelter Model	Shelter Size	
Ekto	8814	896 cuft	

<b>Sensor Component</b>	Sample Tower Type	Condition	Туре В	Status	pass
<b>Sensor Component</b>	Conduit	Condition	N/A	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	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
<b>Sensor Component</b>	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	l Problem
Flow Rate	SHN418	Korey Devins	06/15/2021	Moisture Present	Tylan	56		
The filter sample tubing has drops of moisture in low sections outside the shelter.								

# **Field Systems Comments**

1 Parameter: SiteOpsProcedures

The ozone inlet filter is replaced and the sample train is leak-tested every two weeks.

2 Parameter: ShelterCleanNotes

The shelter is in good condition, clean and well organized

## **Field Systems Data Form** F-02058-1500-S1-rev002 Site Visit Date 06/15/2021 SHN418 Technician Korey Devins Site ID Big Meadows **USGS Map** NPS/EPA Site Sponsor (agency) Map Scale NPS **Operating Group Map Date** 51-113-003 AQS# Climatronics **Meteorological Type** Ozone, PM2.5 Air Pollutant Analyzer **QAPP** Latitude dry, wet, Hg, IMPROVE **QAPP** Longitude **Deposition Measurement Land Use** woodland - mixed **QAPP Elevation Meters** Terrain complex **QAPP Declination** No Conforms to MLM **OAPP Declination Date** 38.5231 **Site Telephone Audit Latitude** Shenandoah National Park -78.43471 Site Address 1 **Audit Longitude** 3655 US Hwy 211 East Site Address 2 **Audit Elevation** 1068 Madison -9.9 **County Audit Declination** Luray, VA City, State **Present** Fire Extinguisher 22835 Inspected May 2021 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 **V Backup Operator Security Fence V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail Shelter Working Room ✓ Make Model 8814 Ekto **Shelter Size** 896 cuft **✓** Notes The shelter is in good condition, clean and well organized Shelter Clean **✓** Notes Site OK

Note: arrange for a "EB submaster" key 4 days in advance to be left at Big Meadows Visitor Center. From DC take

first right. Take the gravel road from the parking lot on the left to the site.

460 west to 29N to 33W to Skyline Drive North. Exit into Big Meadows Visitors Center. Go toward lodge and take the

**Driving Directions** 

Fic	eld Systems Data Form	F-02058-1500-S3-rev002			
Site	SHN418 Technician Korey Devins		Site Visit Date 06/15/2021		
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	<b>✓</b>	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)	<b>✓</b>	N/A		
3	Are the tower and sensors plumb?	<b>✓</b>	N/A		
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	<b>✓</b>			
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)	<b>✓</b>			
6	Is the solar radiation sensor plumb?	<b>✓</b>	N/A		
7	Is it sited to avoid shading, or any artificial or reflected light?	<b>✓</b>	N/A		
8	Is the rain gauge plumb?	<b>✓</b>	N/A		
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	<b>✓</b>	N/A		
10	Is the surface wetness sensor sited with the grid surface facing north?	<b>✓</b>	N/A		
11	Is it inclined approximately 30 degrees?	<b>✓</b>	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	SHN418 Technician Korey Devins	Site Visit Date 06/15/2021
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 necestral or man-made, that may affect the monitoring parameters	ssary) regarding conditions listed above, or any other features, :

F1	eld Systems Data Form		F-02058-1500-S5-rev002
Site	ID SHN418 Technician Korey Devins		Site Visit Date 06/15/2021
	Siting Criteria: Are the pollutant analyzers and deposition e	<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?	<b>✓</b>	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	<b>✓</b>	
	Pollutant analyzers and deposition equipment operations an	d mai	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	<b>✓</b>	
2	Are the analyzers and monitors operational, on-line, and reporting data?	<b>✓</b>	
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)	<b>✓</b>	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	<b>✓</b>	
7	Is the zero air supply desiccant unsaturated?	<b>✓</b>	
8	Are there moisture traps in the sample lines?	<b>✓</b>	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	Clean and dry
	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,

## Field Systems Data Form F-02058-1500-S6-rev002 Site ID SHN418 Technician Korey Devins Site Visit Date 06/15/2021 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 SHN418 Technician Korey Devins Site Visit Date 06/15/2021 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 **V** П **V** Relative humidity sensor Computer **✓** П **V** Solar radiation sensor Modem **V V Printer** Surface wetness sensor **V V** Wind sensor translator Zero air pump **V** Temperature translator **V** Filter flow pump $\checkmark$ **V Humidity sensor translator Surge protector ✓ V UPS Solar radiation translator V V** Tipping bucket rain gauge **Lightning protection device** ~ **✓ Shelter heater** Ozone analyzer **✓** $\checkmark$ 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** Dataview **SSRF V ✓ V V** Site Ops Manual **V V HASP V** Field Ops Manual **V Calibration Reports V V** Ozone z/s/p Control Charts Preventive maintenance schedule 1 Is the station log properly completed during every site visit? ✓ Dataview 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? Dataview 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 SHN418 Technician Korey Devins Site Visit Date 06/15/2021 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** 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** Every 2 weeks Manual Zero/Span Tests **V ~** Daily **Automatic Precision Level Tests V V** Every 2 weeks **Manual Precision Level Test ✓ V Analyzer Diagnostics Tests** Weekly **V** Every 2 weeks **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** Semiannually **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? **✓** 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 replaced and the sample train is leak-tested every two weeks.

Field Systems Data	Form	F-02058-1500-S9-rev002				
Site ID SHN418	Technician Korey Devins	Site Visit Date 06/15/2021				
Site operation procedures						
1 Is the filter pack being ch	anged every Tuesday as scheduled?	Filter changed morinings 90%				
2 Are the Site Status Report correctly?	t Forms being completed and filed					
3 Are data downloads and l scheduled?	packups being performed as	No longer required				
4 Are general observations	being made and recorded? How?	✓ SSRF				
5 Are site supplies on-hand fashion?	and replenished in a timely					
6 Are sample flow rates rec	orded? How?	SSRF				
7 Are samples sent to the la fashion?	b on a regular schedule in a timely					
8 Are filters protected from and shipping? How?	contamination during handling	Clean gloves on and off				
9 Are the site conditions repoperations manager or sta	oorted regularly to the field  aff?					
QC Check Performed	Frequency	Compliant				
Multi-point MFC Calibration	ons Semiannually	<b>✓</b>				
Flow System Leak Checks Weekly		✓				
Filter Pack Inspection						
Flow Rate Setting Checks	<b>✓</b> Weekly	✓				
Visual Check of Flow Rate Rotometer Weekly		✓				
In-line Filter Inspection/Rep	olacement  As needed	✓				
Sample Line Check for Dirt	<mark>∕Water</mark>					
rovide any additional explanation (photograph or sketch if necessary) regarding conditions listed above, or any other features,						

# **Field Systems Data Form**

## F-02058-1500-S10-rev002

Site ID

SHN418

Technician Korey Devins

Site Visit Date 06/15/2021

Site '			

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	8470p	351B4FP	none
DAS	Environmental Sys Corp	8816	2643	90658
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	0288714888	00443
flow rate	Tylan	FC280	AW9605202	03942
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9404009	03485
Ozone	ThermoElectron Inc	49i A3NAA	0903334535	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1030745083	none
Sample Tower	Aluma Tower	В	none	923307
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	14265	none
Zero air pump	Werther International	C 70/4	000855578	none

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
LRL	LRL117-Korey Devins-06/17/2021								
1	6/17/2021	Computer	Dell	07067	Inspiron 15	FF4MC12			
2	6/17/2021	DAS	Campbell	000344	CR300	2123			
3	6/17/2021	Elevation	Elevation	None	1	None			
4	6/17/2021	Filter pack flow pump	Thomas	01133	107CA18	1088003123			
5	6/17/2021	Flow Rate	Apex	000885	AXMC105LPMDPCV	illegible			
6	6/17/2021	Infrastructure	Infrastructure	none	none	none			
7	6/17/2021	Ozone	ThermoElectron Inc	000701	49i A1NAA	1030244808			
8	6/17/2021	Ozone Standard	ThermoElectron Inc	000444	49i A3NAA	CM08200020			
9	6/17/2021	Sample Tower	Aluma Tower	000783	В	none			
10	6/17/2021	Shelter Temperature	Campbell	none	107-L	none			
11	6/17/2021	Siting Criteria	Siting Criteria	None	1	None			
12	6/17/2021	Temperature	RM Young	06245	41342VC	12792			
13	6/17/2021	Zero air pump	Werther International	06904	C 70/4	000821901			

### **DAS Data Form DAS Time Max Error:** 0 Mfg **Serial Number** Site **Technician** Site Visit Date Parameter Use Desc. Campbell 2123 LRL117 Korey Devins 06/17/2021 DAS Primary Das Date: 6 /17/2021 **Audit Date** 6 /17/2021 Fluke Parameter DAS Mfg 08:17:00 08:17:00 **Das Time: Audit Time** 95740135 Tfer Desc. DVM **Serial Number** 168 168 Das Day: **Audit Day** Tfer ID 01311 **Low Channel: High Channel: Avg Diff: Avg Diff: Max Diff: Max Diff:** 1.00000 0.00000 Slope Intercept 0.0001 0.0001 0.0001 0.0001 2/11/2021 1.00000 **Cert Date** CorrCoff Datel Parameter DAS Mfg **Serial Number** 15510194 Tfer Desc. Source generator (D 01320 Tfer ID 1.00000 0.00000 **Slope Intercept** 2/13/2012 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 0.9992 0.9992 V V 0.0000

#### Flow Data Form **Technician Owner ID** Mfg Serial Number Tag Site Site Visit Date Parameter LRL117 Korey Devins 06/17/2021 Flow Rate 000885 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 **DAS 2: DAS 1:** Cal Factor Zero 0.97 A Avg % Diff: A Max % Dif A Avg % Diff A Max % Dif **Cal Factor Full Scale** 1.75% 1.96% 1.6 **Rotometer Reading:** OutputSignal Output S E InputUnit OutputSignall PctDifference Desc. Test type Input l/m Input Corr MfcDisp. 0.00001/mprimary pump off 0.000 0.0000.00-0.011/mleak check 0.000 0.000 0.00 0.00000.00 1/ml/mprimary 0.0000 1/m -1.32% test pt 1 1.519 1.520 1.54 1.50 1/mprimary 1.530 1.54 0.0000 1.50 1/m1/m-1.96% primary test pt 2 1.521 0.00001/m-1.96% primary test pt 3 1.527 1.530 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 Sensor Component Moisture Present Condition See comments Status pass Sensor Component Filter Distance Condition 4.0 cm Status pass Sensor Component Filter Depth Condition 2.0 cm Status pass Status pass **Sensor Component** Filter Azimuth Condition 130 deg

Condition

Sensor Component System Memo

Status pass

## **Ozone Data Form**

ThermoElectron   Inc     1030244808	Mfg	Serial Number	er Tag Site		Technician	Site Visit Date	Parameter	Owner ID
DAS 1:	ThermoElectron Inc	1030244808	LRL117		Korey Devins	06/17/2021	Ozone	000701
DAS 1:   DAS 2:   Slope	1	-						
DAS 1:   DAS 2:   Slope   1.00030   Intercept   0.30550			P-		Serial Numbe	r 1180030022	Tfer Des	C. Ozone primary stan
A Avg % Diff: A Max % Dif	Correon:	0.55555 COL	rcon:	3.00000	Tfer ID	01114		
A Avg % Diff: A Max % Dif	DAS 1:	D	AS 2:		Slone	1.000	30 Intercent	0.30550
UseDescription   ConcGroup   Tfer Raw   Tfer Corr   Site   Site Unit   RelPerDif   AbsDif	A Avg % Diff: A M	Iax % Dif A	Avg %Diff A	Max % Dif	-			
primary   1	0.0%	0.0%			Cert Date	1/20/20	CorrCoff	1.00000
primary   1   0.45   0.14   0.31   ppb   0.17     primary   2   15.53   15.14   13.95   ppb   -1.19     primary   3   35.94   35.45   33.80   ppb   -4.77     primary   4   66.20   65.56   63.28   ppb   -3.54     primary   5   109.27   108.41   105.50   ppb   -2.72     Sensor Component Audit Pressure   Condition   710.3 mm/g   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 ADT > 100 vehicles further than 50   Condition   True   Status pass     Sensor Component   Inlet Filter Condition   Condition   Good   Status pass     Sensor Component   Inlet Filter Condition	UseDescription	ConcGroup	Tfer Raw	Tfer Cor	r Site	Site Unit	RelPerDif	AbsDif
primary 3 35.94 35.45 33.80 ppb 4.4.77 primary 4 66.20 65.56 63.28 ppb -3.54 primary 5 109.27 108.41 105.50 ppb -2.72  Sensor Component Audit Pressure Condition 710.3 mmHg Status pass  Sensor Component 7 Tree dewline >10m or below inlet Condition 7 True Status pass  Sensor Component ADT <100 vehicles further than 20 Condition 7 True Status pass  Sensor Component ADT >100 vehicles further than 50 Condition 7 True Status pass  Sensor Component ADT >100 vehicles further than 50 Condition True Status pass  Sensor Component Fall Frain Condition Good Status pass  Sensor Component Inlet Filter Condition Condition Clean Status pass  Sensor Component Span Condition 0.1 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 0.9 ppb Status pass  Sensor Component Cell A Flow Condition 0.0 For pmHg Status pass  Sensor Component Cell A Freq. Condition 0.0 For pmHg Status pass  Sensor Component Cell A Freq. Condition 0.0 For pmBg Status pass  Sensor Component Cell B Freq. Condition 0.0 For pmBg Status pass  Sensor Component Cell B Freq. Condition 0.0 For pmBg Status pass  Sensor Component Cell B Freq. Condition 0.0 For pmBg Status pass  Sensor Component Cell B Freq. Condition 0.0 For pmBg Status pass  Sensor Component Cell B Freq. Condition 0.0 For pmBg Status pass  Sensor Component Cell B Freq. Condition 0.0 For pmBg Status pass  Sensor Component Cell B Freq. Condition 0.0 For pmBg Status pass  Sensor Component Cell B Freq. Condition 0.0 For pmBg Status pass		1						
primary 4 66.20 65.56 63.28 ppb -3.54 primary 5 109.27 108.41 105.50 ppb -2.7.2  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 Good Status pass  Sensor Component Inlet Filter Condition Condition Clean Status pass  Sensor Component Span Condition Condition Clean Status pass  Sensor Component Span Condition O.1 Status pass  Sensor Component Span Condition NIA Status pass  Sensor Component Fullscale Voltage Condition NIA Status pass  Sensor Component Cell A Freq. Condition 0.9 ppb Status pass  Sensor Component Cell A Freq. Condition 0.0 ppb Status pass  Sensor Component Cell A Freq. Condition 0.0 ppb Status pass  Sensor Component Cell B Freq. Condition 0.0 ppb Status pass  Sensor Component Cell B Freq. Condition 0.0 ppb Status pass  Sensor Component Cell B Noise Condition 0.0 ppb Status pass  Sensor Component Cell B Noise Condition 0.0 ppb Status pass  Sensor Component Cell B Noise Condition 0.0 ppb Status pass  Sensor Component Cell B Noise Condition 0.0 ppb Status pass  Sensor Component Cell B Noise Condition 0.0 ppb Status pass  Sensor Component Cell B Noise Condition 0.0 ppb Status pass  Sensor Component Cell B Noise Condition 0.0 ppb Status pass  Sensor Component Cell B Noise Condition 0.0 ppb Status pass	primary	2	15.53	15.14	13.95	ppb		-1.19
Sensor Component Audit Pressure  Condition  Sensor Component Audit Pressure  Condition  Condition  True  Status pass  Sensor Component  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 20  Condition  Sensor Component  ADT >100 vehicles further than 50  Condition  Sensor Component  ADT >100 vehicles further than 50  Condition  Sensor Component  Sensor Component  Sensor Component  Inlet Filter Condition  Condition  Condition  Condition  Condition  Condition  Condition  Condition  Sensor Component  Condition  N/A  Sensor Component  Sensor Component  Sensor Component  Condition  Sensor Component  Condition  Sensor Component  Condition  Condition  Condition  N/A  Sensor Component  Sensor Component  Condition  Sensor Component  Condition  Condition  Sensor Component  Condition  Condition  Sensor Component  Condition  Condition  Condition  Condition  Condition  Condition  Sensor Component  Coll A Freq:  Condition  Condi	primary	3	35.94	35.45	33.80	ppb	-4.77	
Sensor Component Audit Pressure Condition 710.3 mmHg Status pass Sensor Component 26.6 degree unobstructed rule Condition True Status pass Sensor Component Tree dewline >10m or below inlet Condition True Status pass Sensor Component ADT <100 vehicles further than 20 Condition True Status pass Sensor Component ADT >100 vehicles further than 50 Condition ABB m Status fail Sensor Component Sample Train Condition Good Status pass Sensor Component Inlet Filter Condition Condition Clean Status pass Sensor Component Offset Condition Onlean Status pass Sensor Component Span Condition In In Status pass Sensor Component Zero Voltage Condition In In Status pass Sensor Component Fullscale Voltage Condition In In Status pass Sensor Component Cell A Freq. Condition In	primary	4	66.20	65.56	63.28		-3.54	
Sensor Component Audit Pressure  Condition 710.3 mmHg Status pass  Sensor Component 26.6 degree unobstructed rule Condition True Status pass  Sensor Component Tree dewline >10m or below inlet Condition True Status pass  Sensor Component ADT <100 vehicles further than 20 Condition True Status pass  Sensor Component ADT >100 vehicles further than 50 Condition 488 m Status fail Sensor Component Sample Train Condition Good Status pass Sensor Component Inlet Filter Condition Condition Clean Status pass Sensor Component Offset Condition 0.1 Status pass Sensor Component Zero Voltage Condition N/A Sensor Component Fullscale Voltage Condition N/A Sensor Component Cell A Freq. Condition 137.7 kHz Status pass Sensor Component Cell A Flow Condition 0.60 lpm Status pass Sensor Component Cell A Flow Condition 0.60 lpm Status pass Sensor Component Cell A Pressure Condition 90.6 kHz Sensor Component Cell B Freq: Condition 90.6 kHz Sensor Component Cell B Freq: Condition 90.6 kHz Sensor Component Cell B Noise Condition 0.9 ppb Status pass Sensor Component Cell B Freq: Condition 90.6 kHz Sensor Component Cell B Noise Condition 0.9 ppb Status pass Sensor Component Cell B Freq: Condition 90.6 kHz		5	109.27	108.41	105.50		-2.72	
Sensor Component Tree dewline >10m or below inlet Sensor Component ADT <100 vehicles further than 20 Sensor Component ADT >100 vehicles further than 50 Sensor Component ADT >100 vehicles further than 50 Condition Good Status pass Sensor Component Inlet Filter Condition Clean Status pass Sensor Component Offset Condition O.1 Status pass Sensor Component Span Condition I.011 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 I.37.7 kHz Status pass Sensor Component Cell A Flow Condition I.0.60 lpm Status pass Sensor Component Cell A Freq. Condition I.0.60 lpm Status pass Sensor Component Cell A Freq. Condition IIII IIII IIIIIIIIIIIIIIIIIIIIIIIIII	Sensor Compone	nt Audit Press	ure	Cond	lition 710.3 mmHg		Status pass	
Sensor Component         ADT < 100 vehicles further than 20         Condition         True         Status         pass           Sensor Component         ADT > 100 vehicles further than 50         Condition         488 m         Status         fail           Sensor Component         Sample Train         Condition         Good         Status         pass           Sensor Component         Inlet Filter Condition         Condition         Clean         Status         pass           Sensor Component         Offset         Condition         O.1         Status         pass           Sensor Component         Span         Condition         I.011         Status         pass           Sensor Component         Fullscale Voltage         Condition         N/A         Status         pass           Sensor Component         Cell A Freq.         Condition         I37.7 kHz         Status         pass           Sensor Component         Cell A Flow         Condition         0.60 lpm         Status         pass           Sensor Component         Cell A Flow         Condition         0.60 lpm         Status         pass           Sensor Component         Cell A Tmp.         Condition         0.60 kHz         Status         pass           Senso	Sensor Compone	nt 26.6 degree	unobstructed ru	le Cond	lition True		Status pass	
Sensor Component         ADT <100 vehicles further than 20         Condition         True         Status         pass           Sensor Component         ADT >100 vehicles further than 50         Condition         488 m         Status         fail           Sensor Component         Sample Train         Condition         Good         Status         pass           Sensor Component         Inlet Filter Condition         Condition         Clean         Status         pass           Sensor Component         Offset         Condition         O.1         Status         pass           Sensor Component         Span         Condition         I.011         Status         pass           Sensor Component         Fullscale Voltage         Condition         N/A         Status         pass           Sensor Component         Cell A Freq.         Condition         137.7 kHz         Status         pass           Sensor Component         Cell A Flow         Condition         0.60 lpm         Status         pass           Sensor Component         Cell A Flow         Condition         695.5 mmHg         Status         pass           Sensor Component         Cell B Treq.         Condition         90.6 kHz         Status         pass           Sens	Sensor Compone	nt Tree dewlin	e >10m or below	inlet Cond	lition True		Status pass	
Sensor Component       ADT >100 vehicles further than 50       Condition       488 m       Status       fail         Sensor Component       Sample Train       Condition       Good       Status       pass         Sensor Component       Inlet Filter Condition       Condition       Clean       Status       pass         Sensor Component       Offset       Condition       0.1       Status       pass         Sensor Component       Span       Condition       1.011       Status       pass         Sensor Component       Fullscale Voltage       Condition       N/A       Status       pass         Sensor Component       Cell A Freq.       Condition       137.7 kHz       Status       pass         Sensor Component       Cell A Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell A Flow       Condition       695.5 mmHg       Status       pass         Sensor Component       Cell B Freq.       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Noise       Condition       0.97 ppb       Status       pass         Sensor Component       Cell B Flow       Condition	•							
Sensor Component       Sample Train       Condition       Good       Status       pass         Sensor Component       Inlet Filter Condition       Condition       Clean       Status       pass         Sensor Component       Onlition	•							
Sensor Component       Inlet Filter Condition       Condition       Clean       Status       pass         Sensor Component       Offset       Condition       0.1       Status       pass         Sensor Component       Span       Condition       1.011       Status       pass         Sensor Component       Zero Voltage       Condition       N/A       Status       pass         Sensor Component       Cell A Freq.       Condition       137.7 kHz       Status       pass         Sensor Component       Cell A Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell A Flow       Condition       0.60 lpm       Status       pass         Sensor Component       Cell A Pressure       Condition       695.5 mmHg       Status       pass         Sensor Component       Cell A Tmp.       Condition       30.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Noise       Condition       0.67 lpm       Status       pass	•							
Sensor Component       Offset       Condition       0.1       Status       pass         Sensor Component       Span       Condition       1.011       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       137.7 kHz       Status       pass         Sensor Component       Cell A Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell A Flow       Condition       0.60 lpm       Status       pass         Sensor Component       Cell A Pressure       Condition       695.5 mmHg       Status       pass         Sensor Component       Cell A Tmp.       Condition       30.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       90.6 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.67 lpm       Status       pass	•							
Sensor Component       Span       Condition       1.011       Status       pass         Sensor Component       Zero Voltage       Condition       N/A       Status       pass         Sensor Component       Fullscale Voltage       Condition       137.7 kHz       Status       pass         Sensor Component       Cell A Freq.       Condition       0.9 ppb       Status       pass         Sensor Component       Cell A Flow       Condition       0.60 lpm       Status       pass         Sensor Component       Cell A Pressure       Condition       695.5 mmHg       Status       pass         Sensor Component       Cell A Tmp.       Condition       30.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       90.6 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.67 lpm       Status       pass			ondition					
Sensor ComponentZero VoltageConditionN/AStatuspassSensor ComponentFullscale VoltageConditionN/AStatuspassSensor ComponentCell A Freq.Condition137.7 kHzStatuspassSensor ComponentCell A NoiseCondition0.9 ppbStatuspassSensor ComponentCell A FlowCondition0.60 lpmStatuspassSensor ComponentCell A PressureCondition695.5 mmHgStatuspassSensor ComponentCell A Tmp.Condition30.7 CStatuspassSensor ComponentCell B Freq.Condition90.6 kHzStatuspassSensor ComponentCell B NoiseCondition0.9 ppbStatuspassSensor ComponentCell B FlowCondition0.67 lpmStatuspass								
Sensor ComponentFullscale VoltageConditionN/AStatuspassSensor ComponentCell A Freq.Condition137.7 kHzStatuspassSensor ComponentCell A NoiseCondition0.9 ppbStatuspassSensor ComponentCell A FlowCondition0.60 lpmStatuspassSensor ComponentCell A PressureCondition695.5 mmHgStatuspassSensor ComponentCell A Tmp.Condition30.7 CStatuspassSensor ComponentCell B Freq.Condition90.6 kHzStatuspassSensor ComponentCell B NoiseCondition0.9 ppbStatuspassSensor ComponentCell B FlowCondition0.67 lpmStatuspass				Cond	1.011		Status pass	
Sensor ComponentCell A Freq.Condition137.7 kHzStatuspassSensor ComponentCell A NoiseCondition0.9 ppbStatuspassSensor ComponentCell A FlowCondition0.60 lpmStatuspassSensor ComponentCell A PressureCondition695.5 mmHgStatuspassSensor ComponentCell A Tmp.Condition30.7 CStatuspassSensor ComponentCell B Freq.Condition90.6 kHzStatuspassSensor ComponentCell B NoiseCondition0.9 ppbStatuspassSensor ComponentCell B FlowCondition0.67 lpmStatuspass	Sensor Compone	nt Zero Voltag	e	Cond	lition N/A		Status pass	
Sensor ComponentCell A NoiseCondition0.9 ppbStatuspassSensor ComponentCell A FlowCondition0.60 lpmStatuspassSensor ComponentCell A PressureCondition695.5 mmHgStatuspassSensor ComponentCell A Tmp.Condition30.7 CStatuspassSensor ComponentCell B Freq.Condition90.6 kHzStatuspassSensor ComponentCell B NoiseCondition0.9 ppbStatuspassSensor ComponentCell B FlowCondition0.67 lpmStatuspass	Sensor Compone	nt Fullscale Vo	ltage	Cond	lition N/A		Status pass	
Sensor ComponentCell A FlowCondition0.60 lpmStatuspassSensor ComponentCell A PressureCondition695.5 mmHgStatuspassSensor ComponentCell A Tmp.Condition30.7 CStatuspassSensor ComponentCell B Freq.Condition90.6 kHzStatuspassSensor ComponentCell B NoiseCondition0.9 ppbStatuspassSensor ComponentCell B FlowCondition0.67 lpmStatuspass	Sensor Compone	nt Cell A Freq.		Cond	lition 137.7 kHz		Status pass	
Sensor Component       Cell A Pressure       Condition       695.5 mmHg       Status       pass         Sensor Component       Cell A Tmp.       Condition       30.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       90.6 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.67 lpm       Status       pass	Sensor Compone	nt Cell A Noise	)	Cond	dition 0.9 ppb		Status pass	
Sensor Component       Cell A Tmp.       Condition       30.7 C       Status       pass         Sensor Component       Cell B Freq.       Condition       90.6 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.67 lpm       Status       pass	Sensor Compone	nt Cell A Flow		Cond	lition 0.60 lpm		Status pass	
Sensor Component       Cell B Freq.       Condition       90.6 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.67 lpm       Status       pass	Sensor Compone	nt Cell A Press	sure	Cond	<mark>lition</mark> 695.5 mmHg	)	Status pass	
Sensor Component       Cell B Freq.       Condition       90.6 kHz       Status       pass         Sensor Component       Cell B Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.67 lpm       Status       pass	Sensor Compone	nt Cell A Tmp.		Cond	lition 30.7 C		Status pass	
Sensor Component       Cell B Noise       Condition       0.9 ppb       Status       pass         Sensor Component       Cell B Flow       Condition       0.67 lpm       Status       pass	Sensor Compone	nt Cell B Freq.		Cond	lition 90.6 kHz			
Sensor Component Cell B Flow Condition 0.67 lpm Status pass	Sensor Compone	nt Cell B Noise	)					
Sensor Component Cell B Pressure Condition 696.4 mmHg Status pass	•		sure			]	Status pass	
Sensor Component System Memo Condition Status pass	•					,		
Sensor Component Status Pass	Schsor Compone	Uy Stern Mei		Conc	aruon		Status pass	

### **Temperature Data Form** Serial Number Tag Site **Technician** Site Visit Date Parameter **Owner ID** Mfg Korey Devins RM Young 12792 LRL117 06/17/2021 Temperature 06245 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 0.36 UseDesc. Test type InputTmpRaw InputTmpCorr. OutputTmpSignal OutputSignalEng OSE Unit Difference primary Temp Low Range 0.20 -0.02 0.00000.3 $\mathbf{C}$ 0.36 25.5 C Temp Mid Range 25.69 25.29 0.00000.16 primary 46.09 0.0000C primary Temp High Range 46.65 46.2 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** Korey Devins Campbell none LRL117 06/17/2021 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** 0.37 0.52 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 27.92 27.50 0.00027.0 $\mathbf{C}$ -0.5226.82 C Temp Mid Range 27.24 0.00026.7 -0.17 primary C 25.24 24.84 0.000 25.3 0.41 primary Temp Mid Range Status pass

Condition

Sensor Component System Memo

# **Siting Criteria Form**

<b>Sensor Component</b>	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 LRL117 Technician Korey Devins Site Visit Date 06/17/2021

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	LRL117	Korey Devins	06/17/2021	Moisture Present	Apex	4660		
The filter sample tubing has drops of moisture in low sections outside the shelter.								

### **Field Systems Comments**

1 Parameter: SiteOpsProcedures

Ozone sample line leak checks conducted every other week following the inlet filter replacements.

2 Parameter: ShelterCleanNotes

The shelter is in excellent condition and very clean and well organized. A new peaked roof has been installed.

#### Field Systems Data Form LRL117 Site Visit Date 06/17/2021 Technician Korey Devins Site ID **USGS Map EPA** Site Sponsor (agency) Map Scale private/PADNR **Operating Group Map Date** 42-111-9991 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** 39.988309 **Site Telephone Audit Latitude** Laurel Hill State Park -79.251573 Site Address 1 **Audit Longitude** 1447 Laurel Hill State Park Rd. 609 Site Address 2 **Audit Elevation County Audit Declination** Somerset, PA City, State **Present** Fire Extinguisher 15501 New in 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** Locked gate **V Secure Shelter** Backup Op. Phone # Stable Entry Steps ✓ Backup Op. E-mail **Shelter Working Room** ✓ **Make** Model 8810 640 cuft Ekto **Shelter Size ✓** Notes The shelter is in excellent condition and very clean and well organized. A new peaked roof has been Shelter Clean installed. **✓** Notes Site OK

From Somerset take 30 west

**Driving Directions** 

F-02058-1500-S1-rev002

Fi	eld Systems Data Form	F-02058-1500-S3-rev002					
Site	LRL117 Technician Korey Devins		Site Visit Date 06/17/2021				
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	<b>✓</b>	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)	<b>✓</b>	N/A				
3	Are the tower and sensors plumb?	<b>✓</b>	N/A				
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	<b>✓</b>					
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)	<b>✓</b>					
6	Is the solar radiation sensor plumb?	<b>✓</b>	N/A				
7	Is it sited to avoid shading, or any artificial or reflected light?	<b>?</b> •	N/A				
8	Is the rain gauge plumb?	<b>✓</b>	N/A				
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	<b>✓</b>	N/A				
10	Is the surface wetness sensor sited with the grid surface facing north?	<b>✓</b>	N/A				
11	Is it inclined approximately 30 degrees?	<b>✓</b>	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 LRL117 Technician Korey Devins	Site Visit Date 06/17/2021
1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	✓ Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	Temperature only
3	Are the shields for the temperature and RH sensors clean?	✓ Moderately clean
4	Are the aspirated motors working?	✓ N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	✓ N/A
6	Is the surface wetness sensor grid clean and undamaged?	✓ N/A
7	Are the sensor signal and power cables intact, in good condition, and well maintained?	
8	Are the sensor signal and power cable connections protected from the elements and well maintained?	i 🗹
	ide any additional explanation (photograph or sketch if neces 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
Sit	LRL117 Technician Korey Devins		Site Visit Date 06/17/2021
	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?	<b>✓</b>	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	<b>✓</b>	
	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?	<b>✓</b>	
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?	<b>✓</b>	
7	Is the zero air supply desiccant unsaturated?	<b>✓</b>	
8	Are there moisture traps in the sample lines?	<b>✓</b>	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	<b>✓</b>	Clean and dry
	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,

#### Field Systems Data Form F-02058-1500-S6-rev002 Site ID LRL117 Technician Korey Devins Site Visit Date 06/17/2021 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? 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 I	orn	n			F-02	2058-	-1500-S7-rev00
Site ID LRL117	Т	echnician Ko	rey Devins	Site Visit Date	06/17/202	1	
<u>Documentation</u>							
Does the site have the required	l instr	ument and equ	uipment 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		No N/A	Computer Modem Printer Zero air p Filter flow Surge pro UPS Lightning Shelter he	t recorder  ump pump tector  protection device	Yes  V  V  V  O  O  O  O  O  O  O  O  O  O	No	N/A  V V V V V V V V V V V V V V V V V V
Does the site have the require	ed and	most recent (	OC documents and	report forms?			
I	Presen	t			Curre	ent	
Station Log	<b>✓</b>				<b>✓</b>		
SSRF	✓				<b>✓</b>		
Site Ops Manual	<b>✓</b>	May 2019			<b>✓</b>		
HASP	<b>✓</b>	May 2019			<b>✓</b>		
Field Ops Manual	<b>✓</b>	May 2019			✓		
Calibration Reports	<b>✓</b>				✓		
Ozone z/s/p Control Charts							
Preventive maintenance schedule							
1 Is the station log properly co	-	J	_				
2 Are the Site Status Report F current?	orms	being complete	ed and				
3 Are the chain-of-custody for sample transfer to and from		operly used to	document 🗸				
4 Are ozone z/s/p control char current?	ts pro	perly complete	ed and	Control charts not use	ed		
Provide any additional explanation				regarding condition	ons listed	above,	or any other features,

#### Field Systems Data Form F-02058-1500-S8-rev002 LRL117 Technician Korey Devins Site Visit Date 06/17/2021 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** N/A **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 V** Daily **Automatic Precision Level Tests V Manual Precision Level Test Analyzer Diagnostics Tests ✓ ~** Every 2 weeks **In-line Filter Replacement (at inlet) V 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: Ozone sample line leak checks conducted every other week following the inlet filter replacements.

Fi	eld Sy	stems Data Forn	n			F-02058-1	500-S9-rev002			
Site	e ID	LRL117 T	echnician Korey Devins		Site Visit Date	e 06/17/2021				
	Site ope	ration procedures								
1	Is the fil	ter pack being changed ev	ery Tuesday as schedule	d? ✓	Filter changed afte	ernoons				
2	Are the correctly	Site Status Report Forms y?	being completed and file	d ✓						
3	Are data	a downloads and backups ed?	being performed as		No longer required					
4	Are gen	eral observations being ma	nde and recorded? How?	<b>✓</b>	SSRF, logbook					
5	Are site fashion?	supplies on-hand and rep	enished in a timely	<b>✓</b>						
6	Are sample flow rates recorded? How?				SSRF, logbook, call-in					
7	Are sam fashion?	ples sent to the lab on a re	gular schedule in a time	ly 🗸						
8		ers protected from contaminating? How?	ination during handling	<b>✓</b>	Clean gloves on ar	nd off				
9		site conditions reported reons manager or staff?	gularly to the field	✓						
QC	Check Po	erformed	Frequency			Compliant				
N	Multi-poir	nt MFC Calibrations	<b>✓</b> Semiannually			✓				
F	Flow Syste	em Leak Checks	<b>✓</b> Weekly			✓				
I	ilter Pacl	k Inspection								
I	Flow Rate Setting Checks Weekly				✓					
1	Visual Check of Flow Rate Rotometer ✓ Weekly				✓					
I	In-line Filter Inspection/Replacement   ✓ Semiannually				✓					
S	Sample Li	ne Check for Dirt/Water	Weekly		✓					
		dditional explanation (phon- n-made, that may affect the			y) regarding condit	tions listed above, or a	any other features,			

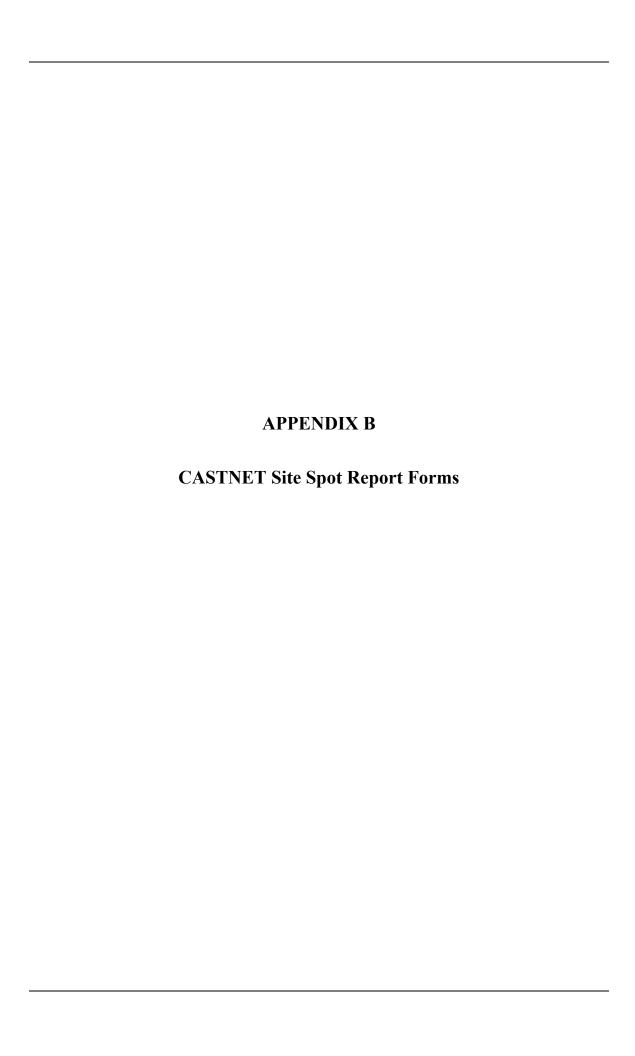
### **Field Systems Data Form**

#### F-02058-1500-S10-rev002

Site ID LRL117 Technician Korey Devins Site Visit Date 06/17/2021

**Site Visit Sensors** 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	FF4MC12	07067
DAS	Campbell	CR300	2123	000344
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	1088003123	01133
Flow Rate	Apex	AXMC105LPMDPC	illegible	000885
Infrastructure	Infrastructure	none	none	none
Ozone	ThermoElectron Inc	49i A1NAA	1030244808	000701
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200020	000444
Sample Tower	Aluma Tower	В	none	000783
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	12792	06245
Zero air pump	Werther International	C 70/4	000821901	06904



Data Compiled:

7/30/2021 12:32:18

SiteVisitDateSiteTechnician06/13/2021ARE128Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99887	unitless	P
2	Ozone Intercept	P	0	5	4	-0.27916	ppb	P
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	P
4	Ozone % difference avg	P	7	10	4	1.0	%	P
5	Ozone Absolute Difference g1	P	7	3	1	-0.26	ppb	P
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.37	daa	P

Data Compiled:

7/29/2021 11:59:20

 SiteVisitDate
 Site
 Technician

 05/07/2021
 BAS601
 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00409	unitless	P
2	Ozone Intercept	P	0	5	4	-0.41773	ppb	P
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	P
4	Ozone % difference avg	P	7	10	4	0.5	%	P
5	Ozone Absolute Difference g1	P	7	3	1	-0.57	ppb	P
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.18	daa	P

Data Compiled:

7/14/2021 08:10:48

SiteVisitDateSiteTechnician04/08/2021BUF603Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.08	c	P
2	Temperature2meter max error	P	5	0.5	3	0.16	c	P
3	Flow Rate average % difference	P	10	5	8	1.7	%	P
4	Flow Rate max % difference	P	10	5	8	3.23	%	P

04/08/2021

**BUF603** 

Martin Valvur

#### **Field Systems Comments**

1 Parameter: DasComments

The NEMA enclosure has a cooling fan.

2 Parameter: DocumentationCo

A disc with the current QAPP has been received and is kept at the site operator's office. The site operator completes and files a hardcopy checklist developed by ARS for BLM each week.

3 Parameter: ShelterCleanNotes

NEMA enclosure, 120 VAC power

4 Parameter: PollAnalyzerCom

The dry deposition filter pack enclosure is not the standard "pot" size that is used at the other CASTNET sites. The diameter of the enclosure is much smaller and the filter is mounted much deeper inside the opening. The geometry of the filter pack and enclosure is likely to impact particle collection efficiency.

5 Parameter: MetSensorComme

The temperature is measured at 2.5 meters above the ground.

Data Compiled:

7/14/2021 16:56:10

SiteVisitDate Site Technician

04/15/2021 CAD150 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.16	c	P
2	Temperature max error	P	4	0.5	9	0.30	c	P
3	Ozone Slope	P	0	1.1	4	1.01633	unitless	P
4	Ozone Intercept	P	0	5	4	-0.08703	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	P
6	Ozone % difference avg	P	7	10	4	1.0	%	P
7	Ozone Absolute Difference g1	P	7	3	1	0.22	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	0.07	ppb	P
9	Flow Rate average % difference	P	10	5	4	0.22	%	P
10	Flow Rate max % difference	P	10	5	4	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	10	1.85	c	P
13	Shelter Temperature max error	P	5	2	10	1.9	c	P

SiteVisitDate	Site	Technician
SilevisilDale	Site	rechnici

04/15/2021

CAD150

Eric Hebert

#### **Field Performance Comments**

1 Parameter: Flow Rate SensorComponent: Moisture Present CommentCode: 72

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

### **Field Systems Comments**

1 Parameter: SiteOpsProcedures

The ozone analyzer sample train filter is replaced and the system is leak tested quarterly.

2 Parameter: ShelterCleanNotes

Some shelter floor tiles are cracked and there is indication of insect damage below the heater. The floor is continuing to rot under the tiles.

3 Parameter: PollAnalyzerCom

There is a moisture trap and dryer in the ozone sample line.

Data Compiled:

7/14/2021 15:32:23

 SiteVisitDate
 Site
 Technician

 04/22/2021
 CAN407
 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98941	unitless	P
2	Ozone Intercept	P	0	5	4	-0.12968	ppb	P
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	P
4	Ozone % difference avg	P	7	10	4	1.9	%	P
5	Ozone Absolute Difference g1	P	7	3	1	0.23	ppb	P
6	Ozone Absolute Difference 92	P	7	1.5	1	-0.49	daa	P

Data Compiled:

7/14/2021 14:10:00

SiteVisitDate Site Technician

04/20/2021 CHC432 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.25	c	P
2	Temperature2meter max error	P	5	0.5	3	0.34	c	P
3	Ozone Slope	P	0	1.1	4	0.99258	unitless	P
4	Ozone Intercept	P	0	5	4	-0.23119	ppb	P
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	P
6	Ozone % difference avg	P	7	10	4	1.6	%	P
7	Ozone Absolute Difference g1	P	7	3	1	-0.17	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.54	ppb	P
9	DAS Voltage average error	P	8	0.003	35	0.0004	V	P
10	Shelter Temperature average error	P	5	2	12	0.24	c	P
11	Shelter Temperature max error	P	5	2	12	0.33	c	P

SiteVisitDate	Site	Technician

04/20/2021

CHC432

Martin Valvur

### **Field Performance Comments**

1 Parameter: Temperature2meter SensorComponent: System Memo CommentCode: 217

Temperature and relative humidity are being measured using a combination sensor which cannot be submerged in a water bath for audits.

### **Field Systems Comments**

1 Parameter: SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

Data Compiled:

7/14/2021 14:34:43

SiteVisitDate Site Technician

04/21/2021 CHE185 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.29	c	P
2	Temperature max error	P	4	0.5	6	0.47	c	P
3	Ozone Slope	P	0	1.1	4	1.00097	unitless	P
4	Ozone Intercept	P	0	5	4	0.02064	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	P
6	Ozone % difference avg	P	7	10	4	0.5	%	P
7	Ozone Absolute Difference g1	P	7	3	1	0.12	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	0.14	ppb	P
9	Flow Rate average % difference	P	10	5	2	1.77	%	P
10	Flow Rate max % difference	P	10	5	2	1.84	%	P
11	Shelter Temperature average error	P	5	2	14	1.65	c	P
12	Shelter Temperature max error	P	5	2	14	1.73	c	P

04/21/2021

CHE185

Eric Hebert

### **Field Systems Comments**

1 Parameter: SiteOpsProcComm

The site is well maintained and operated. Very good sample change out procedures are being used by the site operator.

2 Parameter: SitingCriteriaCom

The site is located in a pasture with grazing cattle sometimes as close as 5 meters.

3 Parameter: ShelterCleanNotes

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

Data Compiled:

7/14/2021 12:13:40

SiteVisitDate Site Technician

04/16/2021 COW137 Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00232	unitless	P
2	Ozone Intercept	P	0	5	4	-0.19439	ppb	P
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	P
4	Ozone % difference avg	P	7	10	4	1.0	%	P
5	Ozone Absolute Difference g1	P	7	3	1	-0.2	ppb	P
6	Ozone Absolute Difference g2	P	7	1.5	1	0.27	ppb	P

Data Compiled:

7/29/2021 12:05:15

 SiteVisitDate
 Site
 Technician

 05/10/2021
 CTH110
 Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00905	unitless	P
2	Ozone Intercept	P	0	5	4	0.00355	ppb	P
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	P
4	Ozone % difference avg	P	7	10	4	0.9	%	P
5	Ozone Absolute Difference g1	P	7	3	1	-0.01	ppb	P
6	Ozone Absolute Difference g2	P	7	1.5	1	0.11	daa	P

Data Compiled:

7/14/2021 16:51:43

SiteVisitDate Site Technician

05/01/2021 CVL151 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.13	c	P
2	Temperature max error	P	4	0.5	9	0.19	c	P
3	Ozone Slope	P	0	1.1	4	1.00353	unitless	P
4	Ozone Intercept	P	0	5	4	-0.10867	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	P
6	Ozone % difference avg	P	7	10	4	0.4	%	P
7	Ozone Absolute Difference g1	P	7	3	1	0.14	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.02	ppb	P
9	Flow Rate average % difference	P	10	5	8	1.35	%	P
10	Flow Rate max % difference	P	10	5	8	1.35	%	P
11	DAS Voltage average error	P	7	0.003	77	0.0001	V	P
12	Shelter Temperature average error	P	5	2	10	1.05	c	P
13	Shelter Temperature max error	P	5	2	10	1.11	c	P

SiteVisitDate	Site	Technician

05/01/2021

CVL151

Eric Hebert

### **Field Systems Comments**

1 Parameter: SitingCriteriaCom

The site is located in a Pine forest on USFS managed land. The tree line has been cut back to at least 17 meters from the site.

2 Parameter: ShelterCleanNotes

The shelter has been repaired since the previous audit visit.

**Data Compiled:** 

7/29/2021 12:56:27

SiteVisitDate Site Technician

05/14/2021 DCP114 Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	12	0.09	c	P
2	Temperature max error	P	4	0.5	12	0.23	c	P
3	Ozone Slope	P	0	1.1	4	1.00931	unitless	P
4	Ozone Intercept	P	0	5	4	-0.30228	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	P
6	Ozone % difference avg	P	7	10	4	0.5	%	P
7	Ozone Absolute Difference g1	P	7	3	1	-0.08	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.14	ppb	P
9	Flow Rate average % difference	P	10	5	8	0.00	%	P
10	Flow Rate max % difference	P	10	5	8	0.00	%	P
11	DAS Voltage average error	P	7	0.003	84	0.0001	V	P
12	Shelter Temperature average error	P	5	2	21	0.47	c	P
13	Shelter Temperature max error	P	5	2	21	0.54	c	P

05/14/2021

DCP114

Korey Devins

#### **Field Performance Comments**

1 Parameter: Flow Rate SensorComponent: Moisture Present CommentCode: 72

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

### **Field Systems Comments**

1 Parameter: SiteOpsProcComm

The site operator is following procedures and doing a very good job with filter handling.

2 Parameter: DasComments

Met tower removed and sample tower not grounded.

3 Parameter: SiteOpsProcedures

The ozone inlet filter is replaced and the sample line is leak-tested every two weeks.

4 Parameter: SitingCriteriaCom

The site is located in a wooded thicket within a state park. The area surrounding the park is almost completely intensive agriculture. The site may not be regionally representative.

5 Parameter: ShelterCleanNotes

The shelter is currently in good condition. The floor has been recently repaired.

6 Parameter: MetOpMaintCom

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

Data Compiled:

7/14/2021 15:44:06

 SiteVisitDate
 Site
 Technician

 04/23/2021
 DIN431
 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97887	unitless	P
2	Ozone Intercept	P	0	5	4	-0.57366	ppb	P
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	P
4	Ozone % difference avg	P	7	10	4	4.6	%	P
5	Ozone Absolute Difference g1	P	7	3	1	-0.06	ppb	P
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.38	dad	P

Data Compiled:

7/14/2021 10:57:41

SiteVisitDate Site Technician

04/15/2021 GAS153 Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98262	unitless	P
2	Ozone Intercept	P	0	5	4	-0.32048	ppb	P
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	P
4	Ozone % difference avg	P	7	10	4	2.8	%	P
5	Ozone Absolute Difference g1	P	7	3	1	-0.13	ppb	P
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.5	daa	P

Data Compiled:

7/28/2021 16:38:38

 SiteVisitDate
 Site
 Technician

 05/05/2021
 GRT434
 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01196	unitless	P
2	Ozone Intercept	P	0	5	4	0.02390	ppb	P
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	P
4	Ozone % difference avg	P	7	10	4	1.0	%	P
5	Ozone Absolute Difference g1	P	7	3	1	0.11	ppb	P
6	Ozone Absolute Difference g2	P	7	1.5	1	0.00	daa	P

Data Compiled:

7/30/2021 10:12:45

SiteVisitDate Site Technician

06/01/2021 GTH161 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	21	0.09	c	P
2	Temperature max error	P	4	0.5	21	0.15	c	P
3	Ozone Slope	P	0	1.1	4	1.02201	unitless	P
4	Ozone Intercept	P	0	5	4	-0.05426	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	P
6	Ozone % difference avg	P	7	10	4	2.0	%	P
7	Ozone Absolute Difference g1	P	7	3	1	0.24	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	0.49	ppb	P
9	Flow Rate average % difference	P	10	5	6	1.69	%	P
10	Flow Rate max % difference	P	10	5	6	2.03	%	P
11	DAS Voltage average error	P	7	0.003	63	0.0001	V	P
12	Shelter Temperature average error	P	5	2	21	0.37	c	P
13	Shelter Temperature max error	P	5	2	21	1.09	c	P

SiteVisitDate	Site	Technician

06/01/2021

GTH161

Martin Valvur

### **Field Systems Comments**

Parameter: ShelterCleanNotes

Some floor tiles are damaged.

2 Parameter: MetSensorComme

The temperature sensor has been moved to the sample tower and mounted in a naturally aspirated shield facing south and over the shelter roof. The met tower has been removed.

Data Compiled:

06/18/2021

7/30/2021 14:57:28

Korey Devins

SiteVisitDate Site Technician

#### Records with valid pass/fail criteria

KEF112

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98837	unitless	P
2	Ozone Intercept	P	0	5	4	-0.1959	ppb	P
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	P
4	Ozone % difference avg	P	7	10	4	2.0	%	P
5	Ozone Absolute Difference g1	P	7	3	1	-0.05	ppb	P
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.52	daa	P

Data Compiled:

7/30/2021 11:41:50

 SiteVisitDate
 Site
 Technician

 06/09/2021
 KIC003
 Martin Valvur

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	0.19	c	P
3	Flow Rate average % difference	P	10	5	6	1.75	%	P
4	Flow Rate max % difference	P	10	5	6	2.29	%	P

SiteVisitDate	Site	Technician

06/09/2021

KIC003

Martin Valvur

### **Field Systems Comments**

1 Parameter: DocumentationCo

The site operator currently maintains records in a logbook provided by Wood.

2 Parameter: SitingCriteriaCom

The site is located across the street from the community school in the town of Powhattan.

3 Parameter: ShelterCleanNotes

Small footprint site with no shelter.

**Data Compiled:** 7/30/2021 11:25:24

 SiteVisitDate
 Site
 Technician

 06/08/2021
 KNZ184
 Martin Valvur

#### Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.01	c	P
2	Temperature max error	P	4	0.5	6	0.01	c	P
3	Flow Rate average % difference	P	10	5	4	1.98	%	P
4	Flow Rate max % difference	P	10	5	4	1.98	%	P
5	DAS Voltage average error	P	7	0.003	56	0.0003	V	P
6	Shelter Temperature average error	P	5	2	21	0.33	c	P
7	Shelter Temperature max error	P	5	2	21	0.79	c	P

## **Field Systems Comments**

1 Parameter: SitingCriteriaCom

The site is located at a Long Term Ecological Research site operated by KSU.

2 Parameter: ShelterCleanNotes

The shelter is very clean, neat, well organized and well maintained. The shelter floor has deteriorated and is poor condition.

Data Compiled:

7/30/2021 14:37:18

SiteVisitDate Site Technician

06/17/2021 LRL117 Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	18	0.22	c	P
2	Temperature max error	P	4	0.5	18	0.36	c	P
3	Ozone Slope	P	0	1.1	4	0.97470	unitless	P
4	Ozone Intercept	P	0	5	4	-0.43498	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99995	unitless	P
6	Ozone % difference avg	P	7	10	4	4.7	%	P
7	Ozone Absolute Difference g1	P	7	3	1	0.17	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.19	ppb	P
9	Flow Rate average % difference	P	10	5	2	1.75	%	P
10	Flow Rate max % difference	P	10	5	2	1.96	%	P
11	DAS Voltage average error	P	7	0.003	77	0.0001	V	P
12	Shelter Temperature average error	P	5	2	21	0.37	c	P
13	Shelter Temperature max error	P	5	2	21	0.52	c	P

SiteVisitDate	Site	Technician

06/17/2021

LRL117

Korey Devins

### **Field Performance Comments**

1 Parameter: Flow Rate SensorComponent: Moisture Present CommentCode: 72

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

## **Field Systems Comments**

1 Parameter: SiteOpsProcedures

Ozone sample line leak checks conducted every other week following the inlet filter replacements.

2 Parameter: ShelterCleanNotes

The shelter is in excellent condition and very clean and well organized. A new peaked roof has been installed.

**Data Compiled:** 

7/14/2021 15:22:56

SiteVisitDate Site Technician

04/21/2021 MEV405 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	1.06	c	Fail
2	Temperature2meter max error	P	5	0.5	3	2.03	c	Fail
3	Ozone Slope	P	0	1.1	4	0.98086	unitless	P
4	Ozone Intercept	P	0	5	4	-1.28734	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99976	unitless	P
6	Ozone % difference avg	P	7	10	4	7.6	%	P
7	Ozone Absolute Difference g1	P	7	3	1	0.09	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	-2.88	ppb	Fail
9	Flow Rate average % difference	P	10	5	12	0.23	%	P
10	Flow Rate max % difference	P	10	5	12	0.33	%	P
11	DAS Voltage average error	P	16	0.003	7	0.0000	V	P
12	Shelter Temperature average error	P	5	2	21	1.27	c	P
13	Shelter Temperature max error	P	5	2	21	1.51	c	P

SiteVisitDate	Site	Technician

04/21/2021

MEV405

Martin Valvur

## **Field Systems Comments**

1 Parameter: SitingCriteriaCom

A large parking lot for park service employees is located approximately 30 meters north of the site.

2 Parameter: ShelterCleanNotes

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

Data Compiled:

7/8/2021 12:58:13

SiteVisitDate Site Technician

04/06/2021 NEC602 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.09	c	P
2	Temperature2meter max error	P	5	0.5	3	0.15	c	P
3	Ozone Slope	P	0	1.1	4	1.00194	unitless	P
4	Ozone Intercept	P	0	5	4	-0.14706	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	P
6	Ozone % difference avg	P	7	10	4	0.6	%	P
7	Ozone Absolute Difference g1	P	7	3	1	-0.02	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	0.12	ppb	P
9	Flow Rate average % difference	P	10	5	2	1.65	%	P
10	Flow Rate max % difference	P	10	5	2	2.21	%	P
11	Shelter Temperature average error	P	5	2	15	0.77	c	P
12	Shelter Temperature max error	P	5	2	15	1.29	c	P

04/06/2021

NEC602

Martin Valvur

### **Field Performance Comments**

1 Parameter: Flow Rate SensorComponent: Filter Depth CommentCode: 71

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

### **Field Systems Comments**

1 Parameter: SiteOpsProcComm

The site operator does not use gloves to handle the filter pack. The bag is used as a glove to install and remove the filter.

2 Parameter: SiteOpsProcedures

The site operator is aware that the desiccant is almost in need of replacement. Some of the items on the SSRF were discussed and the site operator's questions were answered regarding the correct procedures.

3 Parameter: DocumentationCo

The site operator received a disc with the current QAPP which is kept at his office.

4 Parameter: SitingCriteriaCom

The site is located approximately 2 km northeast of Newcastle WY which has a population of approximately 3500. There is an oil refinery in Newcastle. A heavily traveled road is approximately 100m west of the site.

5 Parameter: ShelterCleanNotes

The shelter houses the ozone, DAS, and MFC only.

Data Compiled:

7/28/2021 16:22:34

SiteVisitDate Site Technician

05/03/2021 PND165 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	18	0.06	c	P
2	Temperature max error	P	4	0.5	18	0.14	c	P
3	Ozone Slope	P	0	1.1	4	0.99528	unitless	P
4	Ozone Intercept	P	0	5	4	-0.19251	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	P
6	Ozone % difference avg	P	7	10	4	1.4	%	P
7	Ozone Absolute Difference g1	P	7	3	1	-0.01	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.56	ppb	P
9	Flow Rate average % difference	P	10	5	2	1.31	%	P
10	Flow Rate max % difference	P	10	5	2	1.64	%	P
11	DAS Voltage average error	P	7	0.003	84	0.0001	V	P
12	Shelter Temperature average error	P	5	2	21	0.15	c	P
13	Shelter Temperature max error	P	5	2	21	0.45	c	P

SiteVisitDate	Site	Technician

05/03/2021

PND165

Martin Valvur

### **Field Performance Comments**

1 Parameter: Temperature SensorComponent: Blower CommentCode: 26

The forced-air blower for the shield is not functioning.

## **Field Systems Comments**

1 Parameter: SitingCriteriaCom

Construction at the bottom of the hill and entrance to the site access road has been completed.

2 Parameter: ShelterCleanNotes

The shelter is well maintained.

Data Compiled:

7/30/2021 14:49:11

 SiteVisitDate
 Site
 Technician

 06/17/2021
 PSU106
 Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99478	unitless	P
2	Ozone Intercept	P	0	5	4	-0.26868	ppb	P
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	P
4	Ozone % difference avg	P	7	10	4	1.5	%	P
5	Ozone Absolute Difference g1	P	7	3	1	-0.26	ppb	P
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.49	daa	P

Data Compiled:

7/29/2021 15:31:06

SiteVisitDate Site Technician

05/28/2021 ROM406 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.28	c	P
2	Temperature2meter max error	P	5	0.5	3	0.32	c	P
3	Ozone Slope	P	0	1.1	4	0.99873	unitless	P
4	Ozone Intercept	P	0	5	4	0.49411	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	P
6	Ozone % difference avg	P	7	10	4	0.9	%	P
7	Ozone Absolute Difference g1	P	7	3	1	0.79	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	0.31	ppb	P
9	Flow Rate average % difference	P	10	5	12	2.63	%	P
10	Flow Rate max % difference	P	10	5	12	2.65	%	P
11	DAS Voltage average error	P	10	0.003	7	0.0001	V	P
12	Shelter Temperature average error	P	5	2	12	0.69	c	P
13	Shelter Temperature max error	P	5	2	12	0.89	c	P

SiteVisitDate	Site	Technician

05/28/2021

ROM406

Martin Valvur

## **Field Systems Comments**

1 Parameter: DasComments

Only RH, temperature, and AMoN are mounted on the meteorological tower at approximately 2 meters.

2 Parameter: ShelterCleanNotes

The shelter is clean, neat, organized, and well maintained.

3 Parameter: MetSensorComme

The recorded temperature is being measured at 2.5 meters above the ground and < 1 foot above the AMoN enclosure and facing south.

Data Compiled:

7/29/2021 13:09:45

SiteVisitDateSiteTechnician05/15/2021SAL133Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00487	unitless	P
2	Ozone Intercept	P	0	5	4	-0.16171	ppb	P
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	P
4	Ozone % difference avg	P	7	10	4	0.4	%	P
5	Ozone Absolute Difference g1	P	7	3	1	-0.09	ppb	P
6	Ozone Absolute Difference 92	P	7	1.5	1	-0.09	nnh	P

Data Compiled:

7/29/2021 15:03:23

SiteVisitDate Site Technician

05/21/2021 SEK430 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.06	c	P
2	Temperature2meter max error	P	5	0.5	3	0.07	c	P
3	Ozone Slope	P	0	1.1	4	0.98865	unitless	P
4	Ozone Intercept	P	0	5	4	-0.06176	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	P
6	Ozone % difference avg	P	7	10	4	1.6	%	P
7	Ozone Absolute Difference g1	P	7	3	1	0.16	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.33	ppb	P
9	Flow Rate average % difference	P	10	5	12	1.99	%	P
10	Flow Rate max % difference	P	10	5	12	2.1	%	P
11	DAS Voltage average error	P	15	0.003	63	0.0002	V	P
12	Shelter Temperature average error	P	5	2	21	0.64	c	P
13	Shelter Temperature max error	P	5	2	21	0.75	c	P

SiteVisitDate	Site	Technician

05/21/2021

SEK430

Martin Valvur

### **Field Performance Comments**

1 Parameter: Flow Rate SensorComponent: Filter Position CommentCode: 71

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

### **Field Systems Comments**

1 Parameter: SitingCriteriaCom

The site is a wooded area with spaced trees on three sides and a steep drop in elevation on the west side. Although not strictly conforming to siting criteria it is elevated in a wide valley and representative of the area. Trees are still within 5 meters, however none are higher than the CASTNET sample inlets.

2 Parameter: ShelterCleanNotes

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

3 Parameter: PollAnalyzerCom

The filter pack sample tubing has been spliced with tygon tubing about 5 meters above the ground. The tygon tubing is brown and deteriorating.

Data Compiled:

7/14/2021 17:10:27

SiteVisitDate	Site	Technician
04/08/2021	SHE604	Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.07	c	P
2	Temperature2meter max error	P	5	0.5	3	0.09	c	P
3	Flow Rate average % difference	P	10	5	2	2.04	%	P
4	Flow Rate max % difference	P	10	5	2	2.39	%	P

04/08/2021

**SHE604** 

Martin Valvur

### **Field Systems Comments**

1 Parameter: DasComments

The site power source is solar and wind with battery storage. The NEMA enclosure has a cooling fan.

2 Parameter: SiteOpsProcedures

observations of current meteorological measurements are recorded on a hardcopy checklist for ARS and not on the SSRF.

3 Parameter: DocumentationCo

The site operator is supplied with a disc containing the QAPP, operating procedures, and HASP which is kept at his office. A hard copy BLM check list developed by ARS is completed and sent to ARS each week. Standard CASTNET SSRF forms are being used now.

4 Parameter: SitingCriteriaCom

The site is located in range land. There is an active rail line with coal trains within one kilometer of the site.

5 Parameter: ShelterCleanNotes

NEMA enclosure, wind and solar power

6 Parameter: PollAnalyzerCom

The dry deposition filter pack enclosure is not the standard "pot" size as at the other CASTNET sites. The diameter is much smaller. It is not clear if this will impact particle collection efficiency.

7 Parameter: MetSensorComme

The site is a small footprint solar powered site that has been operating as part of the WARMS network for more than 10 years. Objects violate the 45 degree rule for the tipping bucket rain gage. The temperature and RH are being measured at 2.5 meters above the ground.

8 Parameter: MetOpMaintCom

The accuracy of the DAS was not tested with a voltage source since there were no available test channels.

Data Compiled:

7/30/2021 13:45:48

SiteVisitDate Site Technician

06/15/2021 SHN418 Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.10	c	P
2	Temperature2meter max error	P	5	0.5	3	0.14	c	P
3	Ozone Slope	P	0	1.1	4	0.99057	unitless	P
4	Ozone Intercept	P	0	5	4	-0.11762	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	-0.1	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.38	ppb	P
9	Flow Rate average % difference	P	10	5	14	3.7	%	P
10	Flow Rate max % difference	P	10	5	14	3.96	%	P
11	Shelter Temperature average error	P	5	2	24	0.79	c	P
12	Shelter Temperature max error	P	5	2	24	0.81	c	P

SiteVisitDate Site Technicia	VisitDate
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06/15/2021

SHN418

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 inlet filter is replaced and the sample train is leak-tested every two weeks.

2 Parameter: ShelterCleanNotes

The shelter is in good condition, clean and well organized

Data Compiled:

7/30/2021 13:21:55

SiteVisitDate Site Technician

06/14/2021 VPI120 Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	15	0.19	c	P
2	Temperature max error	P	4	0.5	15	0.34	c	P
3	Ozone Slope	P	0	1.1	4	0.99452	unitless	P
4	Ozone Intercept	P	0	5	4	-0.40728	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	P
6	Ozone % difference avg	P	7	10	4	1.7	%	P
7	Ozone Absolute Difference g1	P	7	3	1	-0.3	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.34	ppb	P
9	Flow Rate average % difference	P	10	5	8	0.65	%	P
10	Flow Rate max % difference	P	10	5	8	0.65	%	P
11	DAS Voltage average error	P	7	0.003	91	0.0000	V	P
12	Shelter Temperature average error	P	5	2	21	0.17	c	P
13	Shelter Temperature max error	P	5	2	21	0.31	c	P

SiteVisitDate	Site	Technician

06/14/2021

VPI120

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: SiteOKNotes

The site was moved to the new location approximately 8/10/2020. There is a significant elevation and land use change.

2 Parameter: ShelterCleanNotes

The shelter is clean, neat, and well organized. Floor tiles are loose and the paneling is deteriorating.

Data Compiled:

6/22/2021 13:16:03

 SiteVisitDate
 Site
 Technician

 04/05/2021
 WNC429
 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	1.68	c	Fail
3	Flow Rate average % difference	P	10	5	2	1.02	%	P
4	Flow Rate max % difference	P	10	5	2	1.78	%	P
5	DAS Voltage average error	P	1	0.003	21	0.0003	V	P
6	Shelter Temperature average error	P	5	2	6	0.67	c	P
7	Shelter Temperature max error	P	5	2	6	1.15	c	P

04/05/2021

**WNC429** 

Martin Valvur

### **Field Performance Comments**

1 Parameter: Flow Rate SensorComponent: Filter Position CommentCode: 71

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

2 Parameter: Temperature2meter SensorComponent: Blower CommentCode: 26

The forced-air blower for the shield is not functioning.

### **Field Systems Comments**

1 Parameter: SiteOpsProcComm

The general observations section of the SSRF is still not completed. Gloves are not used when handling the filter pack, however the filter bag is used as a glove.

2 Parameter: SiteOpsProcedures

The ozone analyzer is operated by the state of South Dakota and the sample train is now 1/4 Teflon with a filter at the inlet 4 meters above the ground.

3 Parameter: DocumentationCo

Records of the routine checks performed by the state of SD personnel are kept onsite in a logbook.

4 Parameter: ShelterCleanNotes

One shelter houses the ozone monitor and is in good condition and clean. The second shelter houses the flow system and IMPROVE. It is older and not climate controlled.

5 Parameter: PollAnalyzerCom

The dry deposition filter is mounted low in the enclosure which changes the particle collection characteristics, and can allow precipitation to enter.

6 Parameter: MetOpMaintCom

The temperature sensor signal cable insulation is cracked and showing signs of extreme wear. There are several sections covered with electrical tape.

Data Compiled:

7/30/2021 12:24:18

SiteVisitDate Site Technician

06/12/2021 WSP144 Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	15	0.11	c	P
2	Temperature max error	P	4	0.5	15	0.31	c	P
3	Ozone Slope	P	0	1.1	4	1.00409	unitless	P
4	Ozone Intercept	P	0	5	4	-0.41434	ppb	P
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	P
6	Ozone % difference avg	P	7	10	4	1.0	%	P
7	Ozone Absolute Difference g1	P	7	3	1	-0.32	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.44	ppb	P
9	Flow Rate average % difference	P	10	5	2	0.22	%	P
10	Flow Rate max % difference	P	10	5	2	0.67	%	P
11	DAS Voltage average error	P	7	0.003	84	0.0000	V	P
12	Shelter Temperature average error	P	5	2	21	0.86	c	P
13	Shelter Temperature max error	P	5	2	21	0.99	c	P

SiteVisitDate	Site	Technician
Jile v iSilbale	JILE	

06/12/2021

WSP144

Korey Devins

### **Field Performance Comments**

1 Parameter: Flow Rate SensorComponent: Moisture Present CommentCode: 72

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

### **Field Systems Comments**

1 Parameter: SiteOpsProcedures

Ozone sample line leak-checks are conducted every two weeks.

2 Parameter: SitingCriteriaCom

The city of Trenton, estimated population greater than 85,000, is within 20 km of the site.

3 Parameter: ShelterCleanNotes

The shelter is in fair condition, clean, very neat, and well organized but beginning to show signs of wear.

Data Compiled:

7/28/2021 17:15:40

SiteVisitDate Site Technician

05/06/2021 YEL408 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.09	c	P
2	Temperature2meter max error	P	5	0.5	3	0.15	c	P
3	Ozone Slope	P	0	1.1	4	0.97127	unitless	P
4	Ozone Intercept	P	0	5	4	-0.20507	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	P
6	Ozone % difference avg	P	7	10	4	3.3	%	P
7	Ozone Absolute Difference g1	P	7	3	1	-0.42	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.72	ppb	P
9	Flow Rate average % difference	P	10	5	3	1.54	%	P
10	Flow Rate max % difference	P	10	5	3	1.81	%	P
11	DAS Voltage average error	P	8	0.003	28	0.0002	V	P
12	Shelter Temperature average error	P	5	2	24	0.14	c	P
13	Shelter Temperature max error	P	5	2	24	0.26	c	P

05/06/2021

YEL408

Martin Valvur

## **Field Systems Comments**

1 Parameter: SiteOpsProcComm

Gloves are not used to handle the filter pack.

2 Parameter: DasComments

The shelter heat and air conditioner run simultaneously.

3 Parameter: SiteOpsProcedures

The ozone inlet filter is replaced and the system is leak tested every two weeks.

4 Parameter: SitingCriteriaCom

The site is located at the edge of a tree line. Trees as tall as 8 meters are near the sample inlet. Trees taller than 10 meters are 15 meters from the inlet.

5 Parameter: ShelterCleanNotes

The shelter is organized and well maintained.

**Data Compiled:** 

7/29/2021 14:15:28

SiteVisitDate Site Technician

05/17/2021 ZIO433 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.25	c	P
2	Temperature2meter max error	P	5	0.5	3	0.28	c	P
3	Ozone Slope	P	0	1.1	4	0.98038	unitless	P
4	Ozone Intercept	P	0	5	4	0.27490	ppb	P
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	P
6	Ozone % difference avg	P	7	10	4	1.6	%	P
7	Ozone Absolute Difference g1	P	7	3	1	0.58	ppb	P
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.31	ppb	P
9	DAS Voltage average error	P	5	0.003	21	0.0001	V	P
10	Shelter Temperature average error	P	5	2	6	0.31	c	P
11	Shelter Temperature max error	P	5	2	6	0.44	c	P

SiteVisitDate Site	Technician
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05/17/2021

ZIO433

Martin Valvur

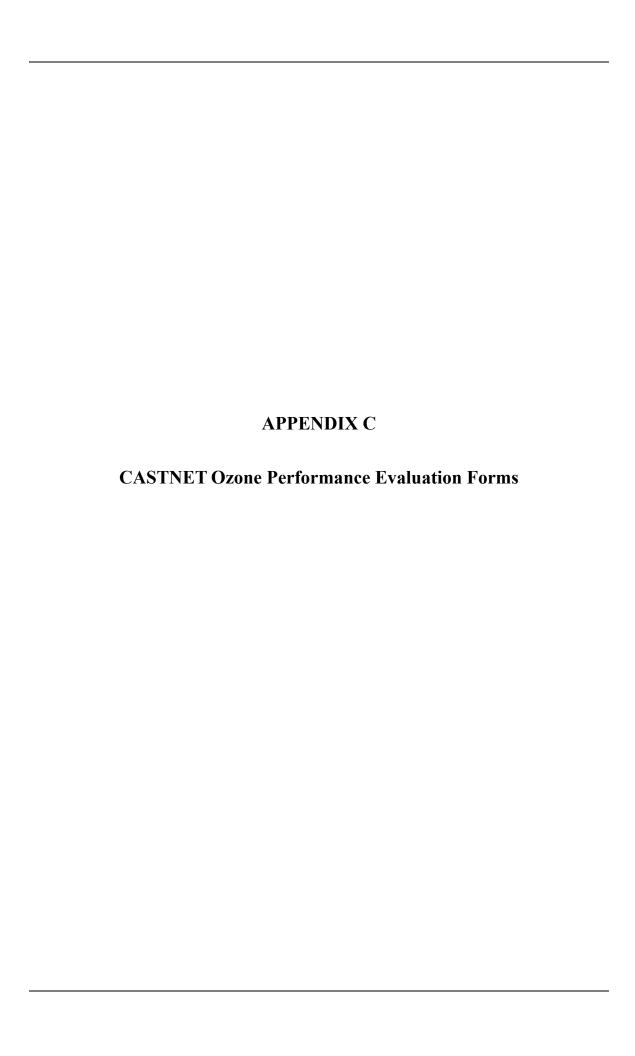
## **Field Systems Comments**

1 Parameter: SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

2 Parameter: MetOpMaintCom

The inside of the temperature shield is dirty.



# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
GAS153-Korey Devins-04/15/2021									
1	4/15/2021	DAS	Campbell	000635	CR3000	4934			
2	4/15/2021	Ozone	ThermoElectron Inc	000737	49i A1NAA	1105347312			
3	4/15/2021	Ozone Standard	ThermoElectron Inc	000215	49i A3NAA	0622717856			
4	4/15/2021	Zero air pump	Werther International	06865	C 70/4	000814277			

### **Ozone Data Form**

Mfg		Serial Numb	er Tag	Site		Te	chnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElec	tron Inc	1105347312		GAS153	3	Ko	orey Devins	04/15/2021	Ozone		000737
Slope: Intercept CorrCoff:	-		pe: ercept rrCoff:	(	0.0000	)	Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114			ozone c. Ozone primary stan
DAS 1:		Γ	AS 2:				Slope	1.0003	30 Inter	roont	0.30550
	oiff: A N	1ax % Dif A		Diff A	Max <sup>o</sup>	% Dif	Stope			сері	
	0%	0.0%					Cert Date	1/20/20	21 Corr	·Coff	1.00000
UseDescr	iption	ConcGroup	Tfeı	r Raw	Tf	er Corr	Site	Site Unit	RelPer	Dif	AbsDif
prima	ry	1	0	.35		0.04	-0.09	ppb			-0.13
prima	•	2	15	5.61		15.22	14.72	ppb			-0.5
prima	-	3		5.88	_	35.39	34.14	ppb		-3.6	
prima		4		5.97	_	56.33	64.73	ppb		-2.44	
prima		5		1.55		10.68	108.60	ppb		-1.9	
	•	nt Audit Pres					736.0 mmHg	FF-	Status		
Sensor C	ompone	nt 26.6 degre	e unobst	ructed ru	ıle	Conditi	on True		Status	pass	
Sensor C	ompone	nt Tree dewlin	ne >10m	or below	inlet	Conditi	on True		Status	pass	
	_	ADT <100				Conditi	7rue		Status	pass	
Sensor C	ompone	ADT >100	vehicles	further th	nan 50	Conditi	on True		Status	pass	
Sensor C	ompone	nt Sample Tra	ain			Condition	Good		Status	pass	
Sensor C	ompone	nt Inlet Filter	Condition	n		Condition	Moderately cle	ean	Status	pass	
Sensor C	ompone	Offset				Condition	0.10		Status	pass	
Sensor C	ompone	ent Span				Condition 1.035			Status	pass	
Sensor C	ompone	nt Zero Volta	ge			Condition	on N/A		Status	pass	
Sensor C	ompone	nt Fullscale V	oltage			Condition	on N/A		Status	pass	
Sensor C	ompone	cell A Fred	ļ.			Condition	0 <b>n</b> 95.7 kHz		Status	pass	
Sensor C	ompone	nt Cell A Nois	e			Condition	0.8 ppb		Status	pass	
Sensor C	ompone	cell A Flow	I			Condition	on 0.65 lpm		Status	pass	
Sensor C	ompone	cell A Pres	sure			Condition	698.7 mmHg		Status	pass	
Sensor C	ompone	Cell A Tmp	).			Condition	36.3 C		Status	pass	
Sensor C	ompone	Cell B Fred	ļ.			Condition	on 113.7 kHz		Status	pass	
Sensor C	ompone	ent Cell B Nois	e				on 1.1 ppb		Status	pass	
Sensor Component Cell B Flow			Condition	ition 0.70 lpm		Status	pass				
Sensor Component Cell B Pressure			Condition	<b>699.6</b> mmHg		Status	pass				
Sensor C	ompone	System Me	emo			Condition	on		Status	pass	

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
COW137-Korey Devins-04/16/2021								
1	4/16/2021	DAS	Campbell	000401	CR3000	2529		
2	4/16/2021	Ozone	ThermoElectron Inc	000728	49i A1NAA	1105347306		
3	4/16/2021	Ozone Standard	ThermoElectron Inc	000441	49i A3NAA	CM08200017		
4	4/16/2021	Zero air pump	Werther International	06940	C 70/4	000821897		

### **Ozone Data Form**

Mfg	Serial Number	er Tag Site		Technician	Site Visit Date	Parameter	Owner ID	
ThermoElectron Inc	1105347306	COW13	7	Korey Devins	04/16/2021	Ozone	000728	
	1.00232 Slop 0.19439 Inte		0.00000	Mfg Serial Number	ThermoElectron		er ozone c. Ozone primary stan	
			0.0000		01114		c. Ozono primary otan	
	_			Tfer ID	01114			
DAS 1:		AS 2:	M 0/ D:6	Slope	1.0003	0 Intercept	0.30550	
A Avg % Diff: A N	0.0% A	Avg %Diff A	Max % Dif	Cert Date	1/20/202	CorrCoff	1.00000	
UseDescription	ConcGroup	Tfer Raw	Tfer Cor	rr Site	Site Unit	RelPerDif	AbsDif	
primary	1	0.42	0.11	-0.09	ppb		-0.2	
primary	2	15.48	15.09	15.36	ppb		0.27	
primary	3	36.27	35.78	35.16	ppb	-1.75		
primary	4	67.74	67.09	67.00	ppb	-0.13		
primary	5	111.97	111.10	111.30	ppb	0.18		
Sensor Compone	Audit Press	ure	Conc	dition 698.6 mmHg		Status pass		
Sensor Compone	26.6 degree	unobstructed ru	le Cond	dition True		Status pass		
Sensor Compone	Tree dewlin	e >10m or below	inlet Conc	dition True		Status pass		
Sensor Compone	ent ADT <100 v	ehicles further the	nan 20 Cond	dition 95		Status Fail		
Sensor Compone	ent ADT >100 v	ehicles further th	nan 50 Cond	dition 95		Status Fail		
Sensor Compone	ent Sample Tra	in	Conc	dition Good		Status pass		
Sensor Compone	Inlet Filter C	Condition	Conc	dition Clean		Status pass		
Sensor Compone	Offset		Conc	dition 0.000		Status pass		
Sensor Compone	ent Span		Conc	dition 1.009		Status pass		
Sensor Compone	zero Voltag	e	Conc	dition N/A		Status pass		
Sensor Compone	Fullscale Vo	oltage	Conc	dition N/A		Status pass		
Sensor Compone	Cell A Freq.		Conc	dition 86.0 kHz		Status pass		
Sensor Compone	Cell A Noise	Э	Conc	dition 0.9 ppb		Status pass		
Sensor Compone	Cell A Flow		Conc	dition 0.71 lpm		Status pass		
Sensor Compone	Cell A Press	sure	Conc	dition 680.2 mmHg		Status pass		
Sensor Compone	Cell A Tmp.		Conc	dition 34.2 C		Status pass		
Sensor Compone	Cell B Freq.		Conc	dition 86.7 kHz		Status pass		
Sensor Compone	Cell B Noise	e	Conc	dition 0.5 ppb		Status pass		
Sensor Compone	Cell B Flow		Conc	dition 0.71 lpm		Status pass		
Sensor Component Cell B Pressure			Conc	dition 680.8 mmHg		Status pass		
Sensor Compone	System Mer	mo	Conc	dition		Status pass		

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
CAN407-Martin Valvur-04/22/2021								
1	4/22/2021	DAS	Environmental Sys Corp	None	8864	C2598		
2	4/22/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745086		
3	4/22/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745084		
4	4/22/2021	Zero air pump	Twin Tower Engineering	90721	TT70/E4	526297		

### **Ozone Data Form**

Mfg	Serial Numbe	er Tag Site		Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030745086	CAN407	7	Martin Valvur	04/22/2021	Ozone	none
	.98941 <b>Slop</b>		0.00000	Mfg	ThermoElectron	Inc Paramet	erozone
			0.00000	Serial Number	49CPS-70008-3	64 Tfer Des	c. Ozone primary stan
CorrCoff: 0	.99998 Cor	rCoff:	0.0000	Tfer ID	01110		
DAS 1:	D	AS 2:		Slope	1.0034	0 Intercept	0.02230
A Avg % Diff: A M	ax % Dif A	Avg %Diff A	Max % Dif	-			
0.0%	0.0%			Cert Date	1/20/202	CorrCoff	1.00000
UseDescription	ConcGroup	Tfer Raw	Tfer Cor	r Site	Site Unit	RelPerDif	AbsDif
primary	1	0.11	0.08	0.31	ppb		0.23
primary	2	15.84	15.68	15.19	ppb		-0.49
primary	3	37.02	36.68	35.75	ppb	-2.57	
primary	4	66.24	65.65	65.03	ppb	-0.95	
primary	5	115.42	114.40	113.10	ppb	-1.14	
Sensor Componen	Audit Press	ure	Conc	lition 612 mmHg		Status pass	
Sensor Componen	26.6 degree	unobstructed ru	le Cond	lition True		Status pass	
Sensor Componen	Tree dewline	e >10m or below	inlet Cond	lition True		Status pass	
Sensor Componen	ADT <100 v	ehicles further th	nan 20 Cond	lition 85		Status Fail	
Sensor Componen	ADT >100 v	ehicles further th	nan 50 Cond	lition 85		Status Fail	
Sensor Componen				lition Good		Status pass	
Sensor Componen				lition Clean		Status pass	
Sensor Componen				lition -0.2		Status pass	
Sensor Componen				lition 1.001		Status pass	
Sensor Componen				lition N/A		Status pass	
Sensor Componen	fullscale Vo	ltage	Cond	lition N/A		Status pass	
Sensor Componen	Cell A Freq.		Cond	lition 82.5 kHz		Status pass	
Sensor Componen	Cell A Noise	)	Conc	0.8 ppb		Status pass	
Sensor Componen	Cell A Flow		Cond	lition 0.68 lpm		Status pass	
Sensor Componen	Cell A Press	sure	Conc	lition 594.4 mmHg		Status pass	
Sensor Componen	Cell A Tmp.		Conc	lition 31.8 C		Status pass	
Sensor Componen	Cell B Freq.		Cond	lition 87.6 kHz		Status pass	
Sensor Componen	Cell B Noise	<b>;</b>	Cond	lition 0.9 ppb		Status pass	
Sensor Componen	Cell B Flow			lition 0.67 lpm		Status pass	
				lition 593.5 mmHg		Status pass	
Sensor Componen				lition		Status pass	
1							

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
DIN4	431-Martin	Valvur-04/23/2021				
1	4/23/2021	DAS	Environmental Sys Corp	None	8864	C2603
2	4/23/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	1211052490
3	4/23/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460050
4	4/23/2021	Zero air pump	Werther International	none	PC70/4	531395

Mfg	S	Serial Numbe	er Tag Site		Tec	chnician	Site Visit Date	Parame	ter	Owner ID
ThermoElec	tron Inc	1211052490	DIN431		Ma	artin Valvur	04/23/2021	Ozone		none
Slope:	0.	97887 <b>Slop</b>	e:	0.00000		Mfg	ThermoElectron	Inc Par	ramete	rozone
Intercept	-0.	57366 Inte	rcept	0.00000		Serial Number	49CPS-70008-3	64 <b>Tfe</b>	er Desc.	Ozone primary stan
CorrCoff:	0.	99996 Cor	rCoff:	0.00000		Tfer ID	01110			
DAS 1:		D	AS 2:			Slope	1.0034	10 Inter	cent	0.02230
A Avg % D	iff: A Ma	ax % Dif A	Avg %Diff A	Max %	6 Dif	-			•	
0.0	0%	0.0%				Cert Date	1/20/202	21 Corr	Coff	1.00000
UseDescri	iption (	ConcGroup	Tfer Raw	Tfe	er Corr	Site	Site Unit	RelPerl	Dif	AbsDif
primai	ry	1	-0.03	-1	0.05	-0.11	ppb			-0.06
primai	ry	2	15.88	1	5.72	14.34	ppb			-1.38
primai	ry	3	36.93	3	6.59	34.95	ppb		-4.58	
primai	ry	4	65.87	6	5.28	63.55	ppb		-2.69	
primai	ry	5	115.48	11	14.46	111.50	ppb		-2.62	
Sensor Co	omponen	Audit Press	ure		Condition	638.7 mmHg		Status	pass	
Sensor Co	omponen	26.6 degree	unobstructed ru	ıle	Condition	True		Status	pass	
Sensor Co	omponen	Tree dewline	e >10m or below	v inlet	Condition	7rue		Status	pass	
Sensor C	omponen	ADT <100 v	ehicles further t	han 20	Conditio	120		Status	Fail	
Sensor C	omponen	ADT >100 v	ehicles further t	han 50	Conditio	on 230		Status	Fail	
Sensor Co	omponen	Sample Tra	in		Condition	Good		Status	pass	
Sensor C	omponen	Inlet Filter C	ondition		Condition	On Clean		Status	pass	
Sensor C	omponen	Offset			Conditio	on 0.10		Status	pass	
Sensor C	omponen	Span			Conditio	on 0.999		Status	pass	
Sensor Co	omponen	Zero Voltag	е		Condition	0.0001		Status	pass	
Sensor C	omponen	Fullscale Vo	ltage		Conditio	on 0.9995		Status	pass	
Sensor C	omponen	Cell A Freq.			Conditio	<b>84.3</b> kHz		Status	pass	
Sensor Co	omponen	Cell A Noise	)		Condition	0.6 ppb		Status	pass	
Sensor Co	omponen	Cell A Flow			Condition	0.68 lpm		Status	pass	
Sensor Co	omponen	Cell A Press	sure		Condition	620.3 mmHg		Status	pass	
Sensor Co	omponen	Cell A Tmp.			Condition	on 31.2 C		Status	pass	
Sensor Co	omponen	Cell B Freq.			Condition	86.8 kHz		Status	pass	
Sensor Co	omponen	Cell B Noise	)		Condition	0.9 ppb		Status	pass	
Sensor Co	omponen	Cell B Flow			Condition	0.67 lpm		Status	pass	
Sensor C	omponen	Cell B Press	sure		Condition	619.7 mmHg		Status	pass	
Sensor Co	omponen	System Mer	no		Conditio	on		Status	pass	

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GRT4	134-Martir	ı Valvur-05/05/2021				
1	5/5/2021	DAS	Environmental Sys Corp	None	8832	A3755K
2	5/5/2021	Ozone	ThermoElectron Inc	none	49i A3NAA	0703334536
3	5/5/2021	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1023943899
4	5/5/2021	Zero air pump	Werther International	none	C 120/TC	001007354

Mfg	Serial Num	ber Tag Site	Te	chnician	Site Visit Date	Parameter	Owner ID
ThermoElectron	Inc 0703334536	6 GRT43	4 M	artin Valvur	05/05/2021	Ozone	none
Slope: Intercept CorrCoff:	0.02390 In	tercept	0.00000 0.00000 0.00000	Mfg Serial Number Tfer ID	ThermoElectron 49CPS-70008-3		ozone ozone primary stan
DAS 1:	1	DAS 2:			4.000	40 -	0.0000
		A Avg %Diff A	Max % Dif	Slope	1.0034	10 Intercept	0.02230
0.0%	0.0%			Cert Date	1/20/202	21 CorrCoff	1.00000
UseDescription	on ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.02	-0.04	0.07	ppb		0.11
primary	2	14.80	14.65	14.65	ppb		0
primary	3	35.06	34.73	35.15	ppb	1.2	
primary	4	64.75	64.17	65.20	ppb	1.59	
primary	5	110.75	109.77	111.00	ppb	1.11	
	ponent Audit Pres		<u> </u>	on 598 mmHg	PF	Status pass	
Sensor Comp	ponent 26.6 degre	ee unobstructed ru	ule Conditi	on True		Status pass	
Sensor Comp	ponent Tree dewl	ine >10m or belov	v inlet Conditi	on True		Status pass	
Sensor Comp	ponent ADT <100	) vehicles further t	han 20 Conditi	on 150 m		Status Fail	
•		) vehicles further t				Status pass	
•	ponent Sample T			on Good		Status pass	
	ponent Inlet Filter			on Clean		Status pass	
	ponent Offset	Corrainorr	Conditi			Status pass	
				on 0.994		Status pass	
Sensor Comp							
	Zero Volta		Conditi			Status pass	
	ponent Fullscale		Conditi			Status pass	
	ponent Cell A Fre		<del></del>	on 104.1 kHz		Status pass	
•	ponent Cell A Noi			on 0.6 ppb		Status pass	
Sensor Comp	ponent Cell A Flo	W		on 0.62 lpm		Status pass	
Sensor Comp	Cell A Pre	essure		on 589.8 mmHg		Status pass	
Sensor Comp	Cell A Tm	p.	Conditi	on 32.9 C		Status pass	
Sensor Comp	ponent Cell B Fre	eq.	Conditi	on 78.9 kHz		Status pass	
Sensor Comp	ponent Cell B Noi	ise	Conditi	<b>on</b> 0.5 ppb		Status pass	
Sensor Comp	ponent Cell B Flo	W	Conditi	on 0.59 lpm		Status pass	
Sensor Comp	ponent Cell B Pre	essure	Conditi	on 588.9 mmHg		Status pass	
Sensor Comp	ponent System M	lemo	Conditi	on		Status pass	

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
BAS601-Martin Valvur-05/07/2021								
1	5/7/2021	DAS	Campbell	none	CR1000	41006		
2	5/7/2021	Ozone	ThermoElectron Inc	L0534684	49i A1NAA	1214552973		
3	5/7/2021	Ozone Standard	ThermoElectron Inc	none	49i E3CAA	1214552971		
4	5/7/2021	Zero air pump	Thomas	none	107CAB18	100800033636		

Mfg		Serial Numb	er Tag Site		Te	chnician	Site Visit Date	Parame	eter	Owner ID
ThermoElec	tron Inc	1214552973	BAS	601	Ma	artin Valvur	05/07/2021	Ozone		L0534684
Slope: Intercept CorrCoff:	-(		ercept	0.00000	0	Mfg Serial Number Tfer ID	ThermoElectron 49CPS-70008-3			ozone Ozone primary stan
DAS 1:		n	AS 2:					10 -		0.00000
	iff∙ Δ N	Iax % Dif A		A May	% Dif	Slope	1.0034	10 Inter	rcept	0.02230
	0%	0.0%	Avg /UDIII	I WIAX	70 DII	Cert Date	1/20/20	21 Corr	Coff	1.00000
UseDescr	iption	ConcGroup	Tfer Rav	7 Tf	er Corr	Site	Site Unit	RelPer	Dif	AbsDif
prima		1	0.69		0.66	0.09	ppb			-0.57
prima	•	2	17.08		16.91	16.73	ppb			-0.18
prima		3	37.01		36.67	36.43	ppb		-0.66	3.10
	•	<u>3</u>	65.83		65.24	65.07	ppb		-0.26	
prima	•									
prima		5	113.58	I	12.58	112.60	ppb		0.02	
Sensor C	ompone	nt Audit Press	ure		Condition	on 656 mmHg		Status	pass	
Sensor C	ompone	nt 26.6 degree	e unobstructe	d rule	Condition	On True		Status	pass	
Sensor C	ompone	nt Tree dewlin	e >10m or be	elow inlet	Condition	on True		Status	pass	
Sensor C	ompone	nt ADT <100 v	vehicles furth	er than 20	Conditi	on 122 m		Status	Fail	
Sensor C	ompone	nt ADT >100 v	vehicles furth	er than 50	Condition	on 122 m		Status	Fail	
Sensor C	ompone	nt Sample Tra	iin		Condition	Good		Status	pass	
Sensor C	ompone	nt Inlet Filter 0	Condition		Condition	on Clean		Status	pass	
Sensor C	ompone	offset Offset			Condition	on 0.1		Status	pass	
Sensor C	ompone	nt Span			Condition	on 1.009		Status	pass	
Sensor C	ompone	nt Zero Voltag	je		Conditi	on N/A		Status	pass	
Sensor C	ompone	nt Fullscale Vo	oltage		Conditi	on N/A		Status	pass	
Sensor C	ompone	nt Cell A Freq			Conditi	0n 103.7 kHz		Status	pass	
Sensor C	ompone	cell A Nois	е		Condition	0.7 ppb		Status	pass	
Sensor C	ompone	cell A Flow			Condition	0.66 lpm		Status	pass	
Sensor C	ompone	cell A Pres	sure		Condition	0n 645.1 mmHg		Status	pass	
Sensor C	ompone	Cell A Tmp			Condition	30.8 C		Status	pass	
Sensor C	ompone	nt Cell B Freq			Condition	on 69.9 kHz		Status	pass	
Sensor C	ompone	cell B Nois	е		Condition	0.8 ppb		Status	pass	
Sensor C	ompone	cell B Flow			Condition	0.68 lpm		Status	pass	
Sensor C	ompone	nt Cell B Pres	sure		Condition	<b>0n</b> 644.5 mmHg		Status	pass	
Sensor C	ompone	nt System Me	mo		Condition	on		Status	pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
CTH110-Korey Devins-05/10/2021									
1	5/10/2021	DAS	Campbell	000415	CR3000	2510			
2	5/10/2021	Ozone	ThermoElectron Inc	000735	49i A1NAA	1105347308			
3	5/10/2021	Ozone Standard	ThermoElectron Inc	000447	49i A3NAA	CM08200023			
4	5/10/2021	Zero air pump	Werther International	06864	PC70/4	000815261			

Mfg	Serial Number	er Tag Site		Te	chnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElectron Inc	1105347308	CTH110	)	Ko	orey Devins	05/10/2021	Ozone		000735
Slope: Intercept CorrCoff:  DAS 1: A Avg % Diff: A M	1.00000 Cor	rcept CrCoff:	0.00000 0.00000 0.00000	Dif	Mfg Serial Number Tfer ID Slope	ThermoElectron 1180030022 01114 1.0003	Tf  BO Inter	er Deso	Ozone primary stan  0.30550
0.0%	0.0%				Cert Date	1/20/202	Cori	Coff	1.00000
UseDescription primary primary primary	ConcGroup  1 2 3 4	Tfer Raw 0.36 15.04 35.87 66.99	Tfer (0.0 14.1 35 66	05 66 38	Site 0.04 14.77 35.73 67.00	Site Unit ppb ppb ppb	RelPer	0.98 0.97	AbsDif -0.01 0.11
primary primary	5	112.39	111.		112.50	ppb ppb		0.97	
Sensor Compone	ent Audit Pressi	1			on 715.5 mmHg	**	Status		
Sensor Compone	ent 26.6 degree	unobstructed ru	le C	onditi	on True		Status	pass	
Sensor Compone					on True		Status		
Sensor Compone	ent ADT <100 v	ehicles further th	nan 20 C	onditi	on 78 m		Status	Fail	
Sensor Compone	ADT >100 v	ehicles further th	nan 50 Co	onditi	<b>on</b> 78 m		Status	Fail	
Sensor Compone	ent Sample Tra	in	C	onditi	on Good		Status	pass	
Sensor Compone	ent Inlet Filter C	ondition	C	onditi	on Clean		Status	pass	
Sensor Compone	ent Offset			onditi	on -0.1		Status	pass	
Sensor Compone	ent Span				on 1.034		Status		
Sensor Compone		Δ			on N/A		Status		
•									
Sensor Compone	ent Fullscale Vo	oltage			on N/A		Status		
Sensor Compone	Cell A Freq.		C	onditi	on 96.7 kHz		Status	pass	
Sensor Compone	ent Cell A Noise	)	C	onditi	on 1.5 ppb		Status	pass	
Sensor Compone	ent Cell A Flow		C	onditi	on 0.57 lpm		Status	pass	
Sensor Compone	ent Cell A Press	sure	C	onditi	on 681.5 mmHg		Status	pass	
Sensor Compone	ent Cell A Tmp.		C	onditi	on 28.2 C		Status	pass	
Sensor Compone					on 87.0 kHz		Status		
Sensor Compone					on 0.9 ppb		Status		
Sensor Compone					on 0.71 lpm		Status		
Sensor Compone		sure			on 682.1 mmHg		Status		
•									
Sensor Compone	System Mer	mo 	C	onditi	on		Status	pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
SAL133-Korey Devins-05/15/2021									
1	5/15/2021	DAS	Campbell	000351	CR3000	2129			
2	5/15/2021	Ozone	ThermoElectron Inc	000622	49i A1NAA	1009241785			
3	5/15/2021	Ozone Standard	ThermoElectron Inc	000371	49i A3NAA	0726124692			
4	5/15/2021	Zero air pump	Werther International	06876	C 70/4	000814286			

Mfg S	erial Numbe	er Tag Site	5	Гесhnician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241785	SAL133		Korey Devins	05/15/2021	Ozone	000622
•	00487 <b>Slop</b>		0.00000	Mfg	ThermoElectron		
		P-	0.00000	Serial Number	1180030022	Tfer Des	c. Ozone primary stan
CorrCoff: 1.	00000 Cor	rCoff:	0.00000	Tfer ID	01114		
DAS 1:	D	AS 2:		Slope	1.0003	Intercept	0.30550
A Avg % Diff: A Ma	x % Dif A	Avg %Diff A	Max % Dif				
0.0%	0.0%			Cert Date	1/20/202	CorrCoff	1.00000
UseDescription (	ConcGroup	Tfer Raw	Tfer Corr	r Site	Site Unit	RelPerDif	AbsDif
primary	1	0.38	0.07	-0.02	ppb		-0.09
primary	2	15.39	15.00	14.91	ppb		-0.09
primary	3	35.02	34.54	34.45	ppb	-0.26	
primary	4	66.67	66.03	66.18	ppb	0.23	
primary	5	110.75	109.89	110.30	ppb	0.37	
Sensor Component	Audit Pressi	'	Cond	ition 745 mmHg		Status pass	
Sensor Component	26.6 degree	unobstructed ru	le Cond	ition True		Status pass	
Sensor Component	Tree dewline	e >10m or below	inlet Cond	ition True		Status pass	
Sensor Component						Status pass	
Sensor Component						Status pass	
Sensor Component				ition Good		Status pass	
•			<del></del>				
Sensor Component		ondition		ition Moderately cle	ean	Status pass	
Sensor Component				ition 0.1		Status pass	
Sensor Component	Span		Cond	<b>ition</b> 1.017		Status pass	
Sensor Component	Zero Voltag	e	Cond	ition N/A		Status pass	
Sensor Component	Fullscale Vo	oltage	Cond	ition N/A		Status pass	
Sensor Component	Cell A Freq.		Cond	ition 114.6 kHz		Status pass	
Sensor Component	Cell A Noise	)	Cond	ition 0.7 ppb		Status pass	
Sensor Component	Cell A Flow		Cond	ition 0.71 lpm		Status pass	
Sensor Component	Cell A Press	sure	Cond	ition 706.6 mmHg		Status pass	
Sensor Component	Cell A Tmp.		Cond	ition 36.5 C		Status pass	
Sensor Component	Cell B Freq.		Cond	ition 95.8 kHz		Status pass	
Sensor Component	Cell B Noise	e	Cond	ition 0.8 ppb		Status pass	
Sensor Component	Cell B Flow			ition 0.72 lpm		Status pass	
Sensor Component	Cell B Press	sure	Cond	ition 707.2 mmHg		Status pass	
Sensor Component			Cond			Status pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
ARE	128-Korey	Devins-06/13/2021				
1	6/13/2021	DAS	Campbell	000400	CR3000	2524
2	6/13/2021	Ozone	ThermoElectron Inc	000725	49i A1NAA	1105347326
3	6/13/2021	Ozone Standard	ThermoElectron Inc	000433	49i A3NAA	CM08200009
4	6/13/2021	Zero air pump	Werther International	06866	PC70/4	000815262

Mfg	Serial Number	er Tag Site	,	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347326	ARE128	3	Korey Devins	06/13/2021	Ozone	000725
1	0.99887 <b>Slop</b>		0.00000	Mfg	ThermoElectron		
			0.00000	Serial Number	1180030022	Tfer Des	c. Ozone primary stan
CorrCon:	1.00000 Cor	rcon:	7.00000	Tfer ID	01114		
DAS 1:	D	AS 2:		Slope	1.0003	0 Intercept	0.30550
A Avg % Diff: A N	Max % Dif A	Avg %Diff A	Max % Dif				
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	0.32	0.01	-0.25	ppb		-0.26
primary	2	15.51	15.12	14.75	ppb		-0.37
primary	3	35.67	35.18	34.93	ppb	-0.71	
primary	4	67.21	66.57	66.21	ppb	-0.54	
primary	5	109.16	108.31	107.90	ppb	-0.38	
Sensor Compone	ent Audit Press	ure	Cond	ition 735.6 mmHg		Status pass	
Sensor Compone	26.6 degree	unobstructed ru	le Cond	ition True		Status pass	
Sensor Compone	Tree dewlin	e >10m or below	inlet Cond	ition True		Status pass	
Sensor Compone	ent ADT <100 v	ehicles further th	nan 20 Cond	ition 140 m		Status Fail	
Sensor Compone	ent ADT >100 v	ehicles further th	nan 50 Cond	ition 298 m		Status Fail	
Sensor Compone	ent Sample Tra	in	Cond	ition Good		Status pass	
Sensor Compone	ent Inlet Filter C	Condition	Cond	ition Moderately cle	ean	Status pass	
Sensor Compone	ent Offset		Cond	ition 0.000		Status pass	
Sensor Compone	ent Span		Cond	1.006		Status pass	
Sensor Compone	ent Zero Voltag	e	Cond	ition N/A		Status pass	
Sensor Compone	ent Fullscale Vo	oltage	Cond	ition N/A		Status pass	
Sensor Compone	Cell A Freq.		Cond	ition 85.6 kHz		Status pass	
Sensor Compone	ent Cell A Noise	9	Cond	ition 0.3 ppb		Status pass	
Sensor Compone	Cell A Flow		Cond	ition 0.73 lpm		Status pass	
Sensor Compone	Cell A Press	sure	Cond	ition 707.0 mmHg		Status pass	
Sensor Compone	Cell A Tmp.		Cond	ition 35.4 C		Status pass	
Sensor Compone	Cell B Freq.		Cond	ition 104.4 kHz		Status pass	
Sensor Compone	Cell B Noise	e	Cond	ition 0.4 ppb		Status pass	
Sensor Compone	Cell B Flow		Cond	ition 0.71 lpm		Status pass	
Sensor Compone	ent Cell B Press	sure	Cond	ition 707.6 mmHg		Status pass	
Sensor Compone	System Mer	mo	Cond	ition		Status pass	

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
PSU.	106-Korey	Devins-06/17/2021				
1	6/17/2021	DAS	Campbell	000407	CR3000	2512
2	6/17/2021	Ozone	ThermoElectron Inc	000615	49i A1NAA	1009241787
3	6/17/2021	Ozone Standard	ThermoElectron Inc	000365	49i A3NAA	0726124688
4	6/17/2021	Zero air pump	Werther International	06921	C 70/4	000836216

Mfg	S	erial Numbe	er Tag Site		Tec	chnician	Site Visit Date	Paramete	er Owner ID
ThermoElect	tron Inc	1009241787	PSU10	3	Ko	rey Devins	06/17/2021	Ozone	000615
Slope:	0.	99478 <b>Slop</b>	e:	0.00000		Mfg	ThermoElectron	Inc Para	ameter ozone
Intercept	-0.			0.00000		Serial Number	1180030022	Tfer	Desc. Ozone primary stan
CorrCoff:	1.	00000 Corr	rCoff:	0.00000		Tfer ID	01114		_ , , ,
						Her ID	01114		
DAS 1:			AS 2:	3.5 0/	D.I.O.	Slope	1.0003	Interc	<b>ept</b> 0.30550
A Avg % D		0.0%	Avg %Diff A	Max %	Dif	Cert Date	1/20/202	21 CorrC	<b>Coff</b> 1.00000
0.0	770	0.070							'
UseDescri	•	ConcGroup	Tfer Raw		r Corr	Site	Site Unit	RelPerD	
primar	•	1	0.40	_	0.09	-0.17	ppb		-0.26
primar	•	2	15.20		4.82	14.33	ppb		-0.49
primar	•	3	34.77		4.29	33.97	ppb		0.94
primar	•	4	67.87		7.22	66.67	ppb		0.82
primar	•	5	111.78		0.91	110.00	ppb	_	0.82
	_	Audit Pressi			Conditio	729.3 mmHg		Status P	ass
Sensor Co	omponent	26.6 degree	unobstructed ru	ıle (	Conditio	on True		Status p	ass
Sensor Co	omponent	Tree dewline	e >10m or belov	/ inlet	Conditio	<b>True</b>		Status p	ass
Sensor Co	omponent	ADT <100 v	ehicles further t	nan 20	Conditio	<b>on</b> 165 m		Status F	ail
Sensor Co	omponent	ADT >100 v	ehicles further t	nan 50	Conditio	on 165 m		Status F	ail
Sensor Co	omponent	Sample Trai	in		Conditio	Good		Status p	ass
Sensor Co	omponent	Inlet Filter C	ondition		Conditio	On Clean		Status p	ass
Sensor Co	omponent	Offset			Conditio	on -0.1		Status p	ass
Sensor Co	omponent	Span			Conditio	on 1.003		Status p	ass
Sensor Co	omponent	Zero Voltage	е		Conditio	on N/A		Status p	ass
Sensor Co	omponent	Fullscale Vo	ltage		Conditio	on N/A		Status p	ass
Sensor Co	omponent	Cell A Freq.			Conditio	97.0 kHz		Status p	ass
Sensor Co	omponent	Cell A Noise	)		Conditio	0.9 ppb		Status p	ass
Sensor Co	omponent	Cell A Flow			Conditio	0.71 lpm		Status p	ass
Sensor Co	omponent	Cell A Press	sure		Conditio	703.4 mmHg		Status p	ass
Sensor Co	omponent	Cell A Tmp.			Conditio	on 34.8 C		Status p	ass
Sensor Co	omponent	Cell B Freq.			Conditio	97.8 kHz		Status p	ass
Sensor Co	omponent	Cell B Noise	)		Conditio	0.8 ppb		Status p	ass
Sensor Co	omponent	Cell B Flow			Conditio	0.71 lpm		Status p	ass
Sensor Co	omponent	Cell B Press	sure		Conditio	704.2 mmHg		Status p	ass
Sensor Co	omponent	System Mer	no		Conditio	on		Status P	ass

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
KEF	112-Korey	Devins-06/18/2021				
1	6/18/2021	DAS	Campbell	000414	CR3000	2537
2	6/18/2021	Ozone	ThermoElectron Inc	000700	49i A1NAA	1030244793
3	6/18/2021	Ozone Standard	ThermoElectron Inc	000432	49i A3NAA	CM08200008
4	6/18/2021	Zero air pump	Werther International	06932	C 70/4	000829174

Mfg	Serial Number	er Tag Site		Tec	chnician	Site Visit Date	Parame	eter	Owner ID
ThermoElectron Inc	1030244793	KEF112	2	Ko	rey Devins	06/18/2021	Ozone		000700
Slope: 0.98837 Slope: Intercept -0.19590 Intercept			0.00000		Mfg Serial Number	ThermoElectron			r ozone  Ozone primary sta
CorrCoff:	1.00000 Cor	rCoff:	0.00000		Tfer ID	01114	7	or Bose	
DAS 1:		AS 2:			Slope	1.0003	30 Inter	rcept	0.30550
A Avg % Diff: A 0.0%	Max % Dif A 0.0%	Avg %Diff A	Max % I	Dif	Cert Date	1/20/202	21 Corr	·Coff	1.00000
UseDescription	ConcGroup	Tfer Raw	Tfer	Corr	Site	Site Unit	RelPer	Dif	AbsDif
primary	1	0.41	0.1		0.05	ppb			-0.05
primary	2	15.20	14.3		14.30	ppb			-0.52
primary	3	34.95	34.4		33.87	ppb		-1.76	
primary	5	67.77 112.22	67. 111.		66.11	ppb		-1.52	
primary  Sensor Compon					706 mmHg	ppb	Status	-1.31	
Sensor Compon					n True				
_							Status		
Sensor Compon					True		Status		
Sensor Compon	ADT <100 v	ehicles further to	nan 20 C	onditio	n 163 m		Status	Fail	
Sensor Compon	ADT >100 v	ehicles further tl	nan 50 Co	onditio	True		Status	pass	
Sensor Compon	Sample Tra	in	Co	onditio	Good		Status	pass	
Sensor Component Inlet File		et Filter Condition		Condition Clean			Status	spass	
Sensor Compon	Offset		C	Condition 0.2		Status		pass	
Sensor Compon	Span				Condition 0.986		Status pass		
Sensor Compon	<mark>zent Zero Voltag</mark>				n N/A		Status		
Sensor Compon	rullscale Vo	oltage	C	onditio	n N/A		Status	pass	
Sensor Compon	Cell A Freq		C	onditio	95.9 kHz		Status	pass	
Sensor Compon	cent Cell A Noise	Э	C	onditio	0.6 ppb		Status	pass	
Sensor Compon	Cell A Flow		C	onditio	0.67 lpm		Status	pass	
Sensor Compon	Cell A Press	Cell A Pressure		ondition 669.7 mmHg			Status	tatus pass	
Sensor Component Cell A Tmp.		C	onditio	ition 36.0 C		Status	s pass		
Sensor Component Cell B Freq.		C	onditio	tion 86.6 kHz		Status	tus pass		
Sensor Component Cell B Noise		C	onditio	lition 0.4 ppb		Status	ntus pass		
Sensor Component Cell B Flow			C	onditio	0.68 lpm		Status pass		
Sensor Component Cell B Pressure		C	onditio	ion 670.6 mmHg		Status	Status pass		
Sangar Campan	System Me	mo	C	onditio	on		Status	pass	