# 2020 – 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 EPA Contract No. EP-W-18-005

**Prepared for:** 

**U. S. Environmental Protection Agency** 

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#### List of Acronyms and Abbreviations

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

## **1.0 CASTNET Quarterly Report**

### 1.1 Introduction

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

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

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

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

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

Currently 84 sites at 82 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 June 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.

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	$\leq$ ±10.0% of input amount		
Relative Humidity	Accuracy	Compared to reference instrument or standard solution	$\leq$ ±10.0% RH		
Solar Radiation	Accuracy	Compared to WRR traceable standard	$\leq \pm 10.0\%$ of daytime average		
Surface Wetness	Response	Distilled water spray mist	Positive response		
Surface Wetness	Sensitivity	1% decade resistance	N/A		
Temperature	ture Accuracy Comparison to 3 NIST measured baths $(\sim 0^{\circ} C, ambient, \sim full-scale)$		$\leq \pm 0.5^{\circ} \mathrm{C}$		
Temperature Difference	Accuracy	Comparison to station temperature sensor	$\leq \pm 0.50^{\circ} \mathrm{C}$		

 Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor Parameter		Audit Challenge	Acceptance Criteria			
Shelter Temperature	Accuracy	Comparison to station temperature sensor	$\leq \pm 2.0^{\circ} \mathrm{C}$			
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	$\leq \pm 5^{\circ}$ from degrees true			
Wind Direction	Linearity	Eight cardinal points on test fixture	$\leq \pm 5^{\circ}$ mean absolute error			
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young			
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	$\leq \pm 0.5$ mps below 5.0 mps input; $\leq \pm 5.0\%$ of input at or above 5.0 mps			
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm			
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	$\leq \pm 5.0\%$ 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 $\leq$ b $\leq$ 5.0 ppb			
Ozone	Correlation measured with a cer		$0.9950 \le r$			
Ozone	Percent Difference	Comparison with Level 2 standard concentration	$\leq \pm 15.1\%$ of test gas concentration and $\leq \pm 0.003$ ppm actual difference			
DAS	Accuracy	Comparison with certified standard	$\leq \pm 0.003 \text{ VDC}$			

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 2020

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 2020. The site locations, sponsor, visit dates, and parameters audited are included in Table 2. The number of sites visited during this period were fewer than scheduled due to the impact of the COVID-19 pandemic.

Site ID	Sponsor	Date	FSA	O3 PE	NOy	FLOW
ROM206	EPA	5/20/2020			1	
IRL141	EPA	5/22/2020	1	1		1
COW137	EPA	5/30/2020	1	1		1
SND152	EPA	5/31/2020	1	1		1
GAS153	EPA	6/1/2020	1	1		1
BAS601	BLM-WSO	6/2/2020		1		
FOR605	BLM-WSO	6/3/2020	1			1
NEC602	BLM-WSO	6/4/2020		1		
SHN418	NPS	6/16/2020		1		
LRL117	EPA	6/17/2020		1		
PRK134	EPA	6/23/2020		1		
GRB411	NPS	6/24/2020	1	1		1

#### Table 2. CASTNET Site Audit Visits

## 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: <u>https://java.epa.gov/castnet/reportPage.do</u>

## 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 located at the Wisconsin State Lab of Hygiene (WSLH) at the University of Wisconsin in Madison. The Mercury Analytical Laboratory (HAL) and the network equipment depot (NED) have been relocated to the WSLH.

### 2.2 **Project Objectives**

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

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

## 2.3 NADP Sites Visited Second Quarter 2020

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

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

Site ID	Sponsor	Date	NTN	MDN	AMON
FL03	EPA	5/19/2020	1		
CO88	NPS	5/20/2020			1
FL19	EPA	5/22/2020			1
FL41	USGS	5/26/2020	1		
NC25	EPA	5/30/2020			1
AL99	EPA	5/31/2020			1
GA41	EPA	6/1/2020			1
WY26	WDEQ	6/1/2020		1	
WY93	ARS	6/2/2020			1
GA09	USFWS	6/3/2020	1	1	
GA20	EPA	6/9/2020	1		
SC19	SCDHEC	6/16/2020		1	
PA97	EPA	6/17/2020			1
CA50	USGS	6/22/2020	1		
SC05	USFWS	6/22/2020	1	1	
WI06	WSLH	6/22/2020	1	1	1
WI35	EPA	6/23/2020			1
WI36	WDNR	6/24/2020	1	1	
W108	WDNR	6/25/2020	1	1	
MI99	USFS	6/26/2020	1	-	
CO93	USFS	6/30/2020	1		

#### Table 3. NADP Site Survey Visits

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

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

## APPENDIX A

**CASTNET** Audit Report Forms

# Site Inventory by Site Visit

Site V	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
IRL14	41-Eric He	ebert-05/22/2020				
1	5/22/2020	Computer	Dell	007024	Inspiron 15	8W2MC12
2	5/22/2020	DAS	Campbell	000340	CR3000	2119
3	5/22/2020	Elevation	Elevation	None	1	None
4	5/22/2020	Filter pack flow pump	Thomas	02759	107CAB18	1192001899
5	5/22/2020	Flow Rate	Apex	000648	AXMC105LPMDPCV	54777
6	5/22/2020	Infrastructure	Infrastructure	none	none	none
7	5/22/2020	Modem	Digi	07124	LR54	unknown
8	5/22/2020	Ozone	ThermoElectron Inc	000609	49i A1NAA	1009241782
9	5/22/2020	Ozone Standard	ThermoElectron Inc	000446	49i A3NAA	CM08200022
10	5/22/2020	Sample Tower	Aluma Tower	000020	В	AT-61152-A-H8-F
11	5/22/2020	Shelter Temperature	Campbell	none	107-L	none
12	5/22/2020	Siting Criteria	Siting Criteria	None	1	None
13	5/22/2020	Temperature	RM Young	illegible	41342VC	14804
14	5/22/2020	Zero air pump	Werther International	06902	PC70/4	000829157

## Flow Data Form

Mfg	fg Serial Number Tag Site		Te	chnician	Site Visit	Date Paran	neter	Owner ID		
Арех	x 54777 IF		IRL141	Er	ic Hebert	05/22/20	20 Flow F	Rate	000648	
					Mfg Serial Number Tfer ID	BIOS 131818 01417		Parameter Fl		
					Slope		1.00032 Int	ercept	-0.02240	
					Cert Date	2/	(17/2020 <b>Co</b>	rrCoff	0.99997	
DAS 1: A Avg % Diff: 1.96%	A Max % Dif 1.96%	DAS 2: A Avg %	Diff A Max	: % Dif	Cal Factor Z Cal Factor F Rotometer R	ull Scale	0.	01 98 45		
Desc.	Test type	Input 1/m	Input Corr	MfcDisp.	OutputSignal	Output S I	E InputUnit	OutputSigna	II PctDifference	
primary	pump off	0.000	0.000	0.00	0.000	-0.01	l/m	l/m		
primary	leak check	0.000	0.000	0.00	0.000	-0.01	l/m	l/m		
primary	test pt 1	1.510	1.530	1.53	0.000	1.50	l/m	l/m	-1.96%	
primary	test pt 2	1.511	1.530	1.53	0.000	1.50	l/m	l/m	-1.96%	
primary	test pt 3	1.511	1.530	1.52	0.000	1.50	1/m	l/m	-1.96%	
Sensor Comp	oonent Leak Tes	st		Conditio	on		Statu	Status pass		
Sensor Comp	oonent Tubing C	Condition		Conditio	Condition Good			<mark>s</mark> pass		
Sensor Comp	ponent Filter Pos	sition		Conditio	on Good		Statu	<mark>s</mark> pass		
Sensor Comp	onent Rotomet	er Conditior	า	Conditio	Dn Clean and dry		Statu	<mark>s</mark> pass		
Sensor Comp	onent Moisture	Present		Conditio	on No moisture p	resent	Statu	s pass		
Sensor Comp	oonent Filter Dis	tance		Conditio	Condition 6.0 cm			<mark>s</mark> pass		
Sensor Comp	oonent Filter De	pth		Conditio	ndition 1.0 cm			<mark>s</mark> pass		
Sensor Comp	oonent Filter Azi	imuth		Conditio	dition 90 deg			Status pass		
Sensor Comp	oonent System	Memo		Conditio	on		Statu	s pass		

## **Ozone Data Form**

Mfg	Serial Number	Tag Site		Technician	Site Visit Date	Parameter	Owner ID	
ThermoElectron Inc	1009241782	IRL141		Eric Hebert	05/22/2020	Ozone	000609	
Intercept 0	Intercept 0.20607 Intercept		0.00000 0.00000 0.00000	Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114		ter ozone sc. Ozone primary stan	
DAS 1: A Avg % Diff: A M 0.0%	DAS ax % Dif A A 0.0%		Max % Dif	Slope Cert Date	0.9995	*	0.29010	
UseDescription primary	ConcGroup 1	Tfer Raw 0.44	Tfer Cor 0.14	0.67	Site Unit ppb	RelPerDif	AbsDif 0.53	
primary primary primary primary	2 3 4 5	15.94 36.55 66.88 111.90	15.65 36.27 66.62 111.66	15.37 36.58 66.04 111.50	ppb ppb ppb ppb	0.85 -0.87 -0.14		
Sensor Componen				ition 763.3 mmHg	rr-	Status pass		
Sensor Componen	t Sample Train		Cond	ition Good		Status pass		
Sensor Componen	t Minimum dista	ance from road	met Cond	ition True		Status pass		
Sensor Componen	t Inlet Filter Co	ndition	Cond	Condition Clean		Status pass		
Sensor Componen	t 26.6 degree u	inobstructed ru	le Cond	ition True		Status pass		
Sensor Componen	t Tree dewline	>10m or below	inlet Cond	Condition True		Status pass		
Sensor Componen	t Offset		Cond	Condition -0.60		Status pass		
Sensor Componen	nt Span		Cond	ition 1.013		Status pass		
Sensor Componen	t Zero Voltage		Cond	ition N/A	Status pass			
Sensor Componen	t Fullscale Volt	age	Cond	ition N/A		Status pass		
Sensor Componen	t Cell A Freq.		Cond	ition 89.9 kHz		Status pass		
Sensor Componen	t Cell A Noise		Cond	ition 0.9 ppb		Status pass		
Sensor Componen	t Cell A Flow		Cond	ition 0.74 lpm		Status pass		
Sensor Componen	nt Cell A Pressu	re	Cond	ition 726.5 mmHg		Status pass		
Sensor Componen	t Cell A Tmp.		Cond	ition 32.5 C		Status pass		
Sensor Componen	t Cell B Freq.		Cond	<mark>ition</mark> 95.9 kHz		Status pass		
Sensor Componer	Sensor Component Cell B Noise		Cond	ition 0.4 ppb		Status pass		
Sensor Component Cell B Flow			Cond	ition 0.74 lpm		Status pass		
Sensor Componen	t Cell B Pressu	re	Cond	ition 725.6 mmHg		Status pass		
Sensor Componen	t Line Loss		Cond	ition Not tested		Status pass		
Sensor Componen	t System Memo	o	Cond	ition		Status pass		

# **Temperature Data Form**

Mfg	Serial Number	Tag Site	Т	[echni	ician	Site V	isit Date	Param	eter	Owner ID
RM Young	14804	IRL141		Eric H	ebert	05/22	/2020	Temper	ature	illegible
				Mf	g	Extecl	n	Pa	rameter Te	emperature
				Ser	rial Number	H2327	734	Tf	er Desc. R	ſD
				Tfe	er ID	01227		]		
DAS 1:	DAS	5 2:		Slo	pe		1.0079	7 Inte	rcept	0.12950
Abs Avg Err	Abs Max Err Abs	Avg Err Abs	Max Err	Err Cert Date		2/14/2020 CorrCoff		rCoff	1.00000	
0.29	0.42			<u></u>						
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary	Temp Low Range	0.30	0.17		0.000		0.6	5	С	0.42
primary	Temp Mid Range	24.50	24.18	8	0.000 2		24.	0	С	-0.19
primary	Temp High Range	48.08	47.57	1	0.000		47.	3	С	-0.27
Sensor Con	nponent Shield		Condi	Condition Clean				Status	pass	
Sensor Component Blower			Condi	Condition N/A				Status	pass	
Sensor Component Properly Sited			Condi	ondition Properly sited				Status	tatus pass	
Sensor Con	nponent System Memo	)	Condi	Condition				Status	pass	

# Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	IRL141	Eric Hebert	05/22/2020	Shelter Temperature	none
DAS 1:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	Iter Temperature
Abs Avg Err Ab	0.30 Abs Avg	Err Abs Max Err	Serial Number	H232734	Tfer Desc. RTD	)
			Tfer ID	01227		
			Slope	1.0079	7 Intercept	0.12950
			Cert Date	2/14/202	0 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.44	26.10	0.000	26.1	С	0.02
primary	Temp Mid Range	25.91	25.58	0.000	000 25.9		0.3
Sensor Con	nponent System Memo		Condition		Status	pass	

#### Infrastructure Data For

Site ID IRL141

Technician Eric Hebert

Site Visit Date 05/22/2020

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

# **Field Systems Comments**

#### 1 Parameter: SiteOpsProcedures

Manual z/s/p performed following ozone inlet filter changes. Leak checks are no longer performed.

#### 2 Parameter: ShelterCleanNotes

The shelter is clean and well organized. The shelter floor and bottom of the walls are severely rotting with extensive mold growth. It has deteriorated since the previous audit.

#### 3 Parameter: MetOpMaintCom

Only the temperature sensor was audited during this visit. The other meteorological sensors were not included. The temperature sensor signal cable shows signs of wear.

# Siting Criteria Form

Sensor Component Large point source of So2 or Nox	Condition	Status pass
Sensor Component City > 50,000	Condition 30 km	Status Fail
Sensor Component City 1,000 to 10,000	Condition	Status pass
Sensor Component City 10,000 to 50,000	Condition 7 km	Status Fail
Sensor Component Feedlot operations	Condition	Status pass
Sensor Component Large parking lot	Condition 100 m	Status Fail
Sensor Component Limited agriculture operations	Condition	Status pass
Sensor Component Major industrial source	Condition	Status pass
Sensor Component Secondary road < or = 100 per da	Condition	Status pass
Sensor Component Secondary road >100 vehicles/da	Condition	Status pass
Sensor Component Small parking lot	Condition 20 m	Status Fail
Sensor Component System Memo	Condition	Status pass
Sensor Component Major highway, airport, or rail yard	Condition	Status pass
Sensor Component Intensive agriculture operations	Condition	Status pass

# Field Systems Data Form

## F-02058-1500-S1-rev002

Site ID IRL141	Technician Eric Hebert	Site Visit Date 05/22	2/2020
Site Sponsor (agency)	EPA/SJRWMD	USGS Map	Sebastian
<b>Operating Group</b>	IRC Health Dept	Map Scale	
AQS #	12-061-9991	Map Date	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	QAPP Latitude	
<b>Deposition Measurement</b>	dry	QAPP Longitude	
Land Use	coastal	QAPP Elevation Meters	
Terrain	flat	QAPP Declination	
Conforms to MLM	Yes	QAPP Declination Date	
Site Telephone	(772) 538-2365	Audit Latitude	27.849215
Site Address 1	Sebastian Inlet State Park	Audit Longitude	-80.455595
Site Address 2	9700 South A1A	Audit Elevation	2
County	Indian River	Audit Declination	-5.8
City, State	Melbourne Beach, FL	Present	
Zip Code	32951	Fire Extinguisher 🗹	inspected May 2020
Time Zone	Eastern	First Aid Kit	
Primary Operator		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 ✓	
Shelter Working Room	Make Ekto M	odel 8810	Shelter Size 640 cuft
Shelter Clean		rganized. The shelter floor and has deteriorated since the prev	bottom of the walls are severely rotting vious audit.
Site OK	Notes	- I -	
Sebas	I-95 take exit 180, east on 192 to AIA. To stian Inlet bridge. Once over the bridge, t ite is at the west end of the road past the	urn right at the entrance to the	

eld Sy	stems Data Fo	orm				<b>F-020</b>	58-1	500-S3	8-rev002
ID	IRL141	Technician	Eric Hebert		Site Visit Date	05/22/2020			
			as to avoid	✓	N/A				
(i.e. wind horizont	l sensors should be m ally extended boom >	ounted atop the 2x the max dian	tower or on a		N/A				
Are the	tower and sensors plu	mb?		✓	N/A				
			·	✓					
condition surface a	ns? (i.e. ground below and not steeply sloped	sensors should . Ridges, hollow	be natural						
Is the sol	lar radiation sensor p	lumb?		✓	N/A				
Is it sited	l to avoid shading, or	any artificial or	reflected light?	✓	N/A				
Is the ra	in gauge plumb?			✓	N/A				
		ffects from buil	dings, trees,		N/A				
		sited with the gr	id surface	✓	N/A				
Is it incl	ined approximately 3	0 degrees?			N/A				
	Are wind being inf Are wind (i.e. wind horizont tower int Are the f avoid rad Are temp condition surface a standing Is the sol Is it sited towers, e Is the surfacing no	E IDIRL141Are wind speed and direction being influenced by obstruction Are wind sensors mounted so (i.e. wind sensors should be m horizontally extended boom > tower into the prevailing wind Are the tower and sensors plueAre the temperature shields p avoid radiated heat sources su Are temperature and RH sense conditions? (i.e. ground below surface and not steeply sloped standing water should be avoid Is the solar radiation sensor pIs it sited to avoid shading, or Is it sited to avoid shading, or sufficient to avoid sheltering e towers, etc?Is the surface wetness sensor s facing north?	Are wind speed and direction sensors sited so being influenced by obstructions? Are wind sensors mounted so as to minimize to (i.e. wind sensors should be mounted atop the horizontally extended boom >2x the max diar tower into the prevailing wind) Are the tower and sensors plumb? Are the tower and sensors plumb? Are the temperature shields pointed north or avoid radiated heat sources such as buildings? Are temperature and RH sensors sited to avo conditions? (i.e. ground below sensors should surface and not steeply sloped. Ridges, hollow standing water should be avoided) Is the solar radiation sensor plumb? Is it sited to avoid shading, or any artificial or Is the rain gauge plumb? Is it sited to avoid sheltering effects from built towers, etc? Is the surface wetness sensor sited with the gr	e IDIRL141TechnicianEric HebertAre wind speed and direction sensors sited so as to avoid being influenced by obstructions?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) Are the tower and sensors plumb?Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc? Are temperature and RH sensors should be natural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)Is the solar radiation sensor plumb?Is the solar radiation sensor plumb?Is the rain gauge plumb?Is it sited to avoid sheltering effects from buildings, trees, towers, etc?Is the surface wetness sensor sited with the grid surface facing north?	a ID       RL141       Technician       Eric Hebert         Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?       Image: Construction of the sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)       Image: Construction of the sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)       Image: Construction of the sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower and sensors plumb?       Image: Construction of the sensor of the tower or on a horizontally extended boom >2x the max diameter of the tower and sensors plumb?         Are the tower and sensors plumb?       Image: Construction of the prevailing wind)       Image: Construction of the prevailing wind)         Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?       Image: Conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)       Image: Condition of the sensor plumb?       Image: Condition of the sensor plumb?       Image: Condition of the sensor plumb?       Image: Condition of the sensor plumb?       Image: Condition of the sensor	2 ID IRL141 Technician Eric Hebert Site Visit Date   Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? 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) Are the tower and sensors plumb? M/A Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc? 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) Is the solar radiation sensor plumb? M/A Is it sited to avoid shading, or any artificial or reflected light? M/A Is it sited to avoid sheltering effects from buildings, trees, towers, etc? Is the surface wetness sensor sited with the grid surface facing north? M/A	2 ID IRL141 Technician Eric Hebert Site Visit Date 05/22/2020   Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? 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) Are the tower and sensors plumb? Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc? Are temperature and RH sensors should be natural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided) Is the solar radiation sensor plumb? N/A Is it sited to avoid shading, or any artificial or reflected light? N/A Is it sited to avoid sheltering effects from buildings, trees, towers, etc? Is the surface wetness sensor sited with the grid surface facing north? N/A	ID IRL141 Technician Eric Hebert Site Visit Date 05/22/2020   Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? 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 and sensors plumb? \/\A   Are the tower and sensors plumb? \/\A   Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc? \/\A   Are the 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) \/\A   Is the solar radiation sensor plumb? \/\A   Is it sited to avoid shading, or any artificial or reflected light? \/\A   Is it sited to avoid sheltering effects from buildings, trees, towers, etc? \/\A   Is the surface wetness sensor sited with the grid surface facing north? \/\A	ID IRL141 Technician Fit Hebert Site Visit Date 05/22/2020   Are wind speed and direction sensors sited so as to avoid being influenced by obstructions? 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 and sensors plumb? IN/A   Are the tower and sensors plumb? IN/A   Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc? IN/A   Are the 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) IN/A   Is the solar radiation sensor plumb? IN/A   Is the rain gauge plumb? IN/A   Is the surface wetness sensor sited with the grid surface from buildings, trees, fowers, etc? IN/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	e ID	IRL141	Technician	Eric Hebert		Site Visit Date	05/22/2020	
1		e meterological sensor 1, and well maintained		intact, in good	✓			
2	Are all th reporting	ne meteorological sens g data?	ors operational	online, and	✓			
3	Are the s	hields for the tempera	ature and RH so	ensors clean?	✓			
4	Are the aspirated motors working?							
5	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		ensor signal and powe a, and well maintained		in good	✓	Signs of wear		
8		ensor signal and powe elements and well ma		tions protected	✓			

Provide any additional 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 the temperature sensor was audited during this visit. The other meteorological sensors were not included. The temperature sensor signal cable shows signs of wear.

Fi	eld Sy	stems Data Fo	orm		F-02058-1500-S5-rev002
Site	e ID	IRL141	Technician Eric Hebert		Site Visit Date 05/22/2020
	Siting C	Criteria: Are the pollut	ant analyzers and deposition eq	uipr	nent sited in accordance with 40 CFR 58, Appendix E
1		cample inlets have at lo icted airflow?	east a 270 degree arc of	✓	
2	Are the	sample inlets 3 - 15 m	eters above the ground?	✓	
3		sample inlets > 1 meto meters from trees?	er from any major obstruction,		
	<u>Pollutar</u>	nt analyzers and depos	sition equipment operations and	l mai	intenance
1		analyzers and equipmo on and well maintained	ent appear to be in good 1?	✓	
2	Are the reportin		rs operational, on-line, and	✓	
3	Describe	e ozone sample tube.			1/4 teflon by 15 meters
4	Describ	e dry dep sample tube			3/8 teflon by 15 meters
5		ine filters used in the o location)	ozone sample line? (if yes	✓	At inlet only
6	Are sam obstruct	· · · · · · · · · · · · · · · · · · ·	kinks, moisture, and		Moisture in tubing only
7	Is the ze	ero air supply desiccar	at unsaturated?	✓	
8	Are the	re moisture traps in th	e sample lines?	✓	
9	Is there clean?	a rotometer in the dry	y deposition filter line, and is it		Clean and dry

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

Fi	eld Sy	stems Data Fo					<b>F-020</b>	58-15	00-S6-rev002	
Site	e ID	IRL141	Technician	Eric Hebert		Site Visit	Date 05/2	22/2020		
	DAS, ser	nsor translators, and j	peripheral equij	pment operation	<u>ıs ar</u>	<u>ıd maintenan</u>	<u>ce</u>			
1		OAS instruments appe ntained?	ear to be in good	condition and						
2		he components of the backup, etc)	DAS operation	al? (printers,	✓					
<b>3</b> Do the analyzer and sensor signal leads pass through lightning protection circuitry?					Met sensors o	only				
4 Are the signal connections protected from the weather and well maintained?				e weather and	✓					
5	Are the	signal leads connected	l to the correct ]	DAS channel?	✓					
6	Are the grounde	DAS, sensor translato d?	ors, and shelter <b>j</b>	properly	✓					
7	Does the	instrument shelter h	ave a stable pow	ver source?						
8	Is the in	strument shelter temp	perature control	led?	✓					
9	Is the m	et tower stable and gr	ounded?			Stable		Gr	ounded	
10	Is the sa	mple tower stable and	l grounded?							
11	Tower c	omments?							Ľ	

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

Field Systems Data	For	m				<b>F-02</b>	058-	-1500-S7-rev002
Site ID IRL141		Tech	nician Eri	ic Hebert	Site Visit Date	05/22/2020		
<b>Documentation</b>								
<b>Does the site have the require</b>	ed inst	trume	ent and eq	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 Solar radiation translator Tipping bucket rain gauge Ozone analyzer Filter pack flow controller Filter pack MFC power supply	Yes		N/A V V V V V V V V V V V V V	Data logger Data logger Strip chart r Computer Modem Printer Zero air pur Filter flow p Surge protec UPS Lightning pu Shelter heat	np ump ctor rotection device er	Yes		
Does the site have the requir		nd ma		OC documents and r	enort forms?			
	Prese		<u>ist recent (</u>	JC documents and r	eport forms:	Curren	nt	
Station Log SSRF Site Ops Manual HASP Field Ops Manual Calibration Reports Ozone z/s/p Control Charts Preventive maintenance schedul	I I I I I I I I I I I I I I I I I I I		Feb 2014 Feb 2014					

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

Control charts not used

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

 $\checkmark$ 

## **Field Systems Data Form**

flollowed by the site operator?

5

#### IRL141 Technician Eric Hebert Site Visit Date 05/22/2020 Site ID Site operation procedures on-site 7/9/2001 by MACTEC employee Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 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 ✓ 3 schedule? $\checkmark$ Are the standard CASTNET operational procedures being 4

the required site activities? (including documentation)

Is the site operator(s) knowledgeable of, and able to perform

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	$\checkmark$	Semiannually	
Automatic Zero/Span Tests	$\checkmark$	Daily	
Manual Zero/Span Tests			
Automatic Precision Level Tests	$\checkmark$	Daily	$\checkmark$
Manual Precision Level Test			
Analyzer Diagnostics Tests	$\checkmark$	Weekly	$\checkmark$
In-line Filter Replacement (at inlet)	$\checkmark$	Every 2 weeks	$\checkmark$
In-line Filter Replacement (at analyze		N/A	$\checkmark$
Sample Line Check for Dirt/Water	$\checkmark$	Weekly	$\checkmark$
Zero Air Desiccant Check	$\checkmark$	Weekly	$\checkmark$
1 Do multi-noint calibration gases go thro	uơh the	complete Unknown	

- sample train including all filters?
- 2 Do automatic and manual z/s/p gasses go through the complete sample train including all filters?

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

	Unknown	
✓		
_		
✓	SSRF, 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:

Manual z/s/p performed following ozone inlet filter changes. Leak checks are no longer performed.

<b>F-0</b>	204	58_1	500-	S8-1	revA	02
<b>r -</b> U	203	20-1	.300-	-00-I	revu	UZ

#### **Field Systems Data Form** F-02058-1500-S9-rev002 IRL141 Technician Eric Hebert Site Visit Date 05/22/2020 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? ✓ Filter changed mornings 1 Are the Site Status Report Forms being completed and filed 2 correctly? No longer required Are data downloads and backups being performed as 3 scheduled? SSRF, logbook Are general observations being made and recorded? How? 4 ✓ Are site supplies on-hand and replenished in a timely 5 fashion? SSRF, logbook, call-in Are sample flow rates recorded? How? 6 $\checkmark$ Are samples sent to the lab on a regular schedule in a timely 🗹 7 fashion? ✓ Clean gloves on and off Are filters protected from contamination during handling 8 and shipping? How? ✓ Are the site conditions reported regularly to the field 9 operations manager or staff? **QC Check Performed** Compliant Frequency $\checkmark$ Semiannually **Multi-point MFC Calibrations** ✓ Weekly ✓ **Flow System Leak Checks Filter Pack Inspection** $\checkmark$ ✓ Weekly **Flow Rate Setting Checks** ✓ Weekly $\checkmark$ Visual Check of Flow Rate Rotometer Semiannually $\checkmark$ **In-line Filter Inspection/Replacement**

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

✓ Weekly

Sample Line Check for Dirt/Water

 $\checkmark$ 

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	8W2MC12	007024
DAS	Campbell	CR3000	2119	000340
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	1192001899	02759
Flow Rate	Apex	AXMC105LPMDPC	54777	000648
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07124
Ozone	ThermoElectron Inc	49i A1NAA	1009241782	000609
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200022	000446
Sample Tower	Aluma Tower	B	AT-61152-A-H8-F	000020
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14804	illegible
Zero air pump	Werther International	PC70/4	000829157	06902

Technician Eric Hebert

F-02058-1500-S10-rev002

Site Visit Date 05/22/2020

**Field Systems Data Form** 

IRL141

Site ID

**Site Visit Sensors** 

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CO	W137-Sandy	, Grenville-05/30/2020				
1	5/30/2020	Computer	Dell	07049	Inspiron 15	1K2MC12
2	5/30/2020	DAS	Campbell	000401	CR3000	2529
3	5/30/2020	elevation	Elevation	none	1	None
4	5/30/2020	Filter pack flow pump	Thomas	02758	107CAB18	001871
5	5/30/2020	Flow Rate	Apex	000555	AXMC105LPMDPCV	illegible
6	5/30/2020	Infrastructure	Infrastructure	none	none	none
7	5/30/2020	Modem	Digi	07164	LR54	unknown
8	5/30/2020	Ozone	ThermoElectron Inc	000689	49i A1NAA	1030244797
9	5/30/2020	Ozone Standard	ThermoElectron Inc	000441	49i A3NAA	CM08200017
10	5/30/2020	Sample Tower	Aluma Tower	03499	A	none
11	5/30/2020	Shelter Temperature	Campbell	none	107-L	none
12	5/30/2020	Siting Criteria	Siting Criteria	None	1	None
13	5/30/2020	Temperature	RM Young	02934	41342	none
14	5/30/2020	UPS	APC	none	650	unknown
15	5/30/2020	Zero air pump	Werther International	06940	C 70/4	000821897

## **DAS Data Form**

DAS Time Max Error:

0

Mfg	Serial Nu	mber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2529	COM	/137	Sandy Grenville	05/30/2020	DAS	Primary
Das Date:	5 /30/2020 14:11:30	Audit Date	5 /30/2020 14:11:30	Mfg	Datel	Parameter	DAS
Das Time:	14.11.30	Audit Time	14.11.30	Serial Number	15510194	Tfer Desc.	Source generator (D
Low Channel:		High Channel	:	Tfer ID	01320	]	
<b>Avg Diff:</b> 0.0001	Max Diff: 0.0002	<b>Avg Diff:</b> 0.0001	Max Diff: 0.0002	Slope	1.00000	Intercept	0.00000
0.0001	0.0002	0.0001	0.0002	Cert Date	2/13/2012	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311	]	
				Slope	1.00000	Intercept	0.00000
				Cert Date	1/28/2020	CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0001	V	V	0.0001	
7	0.1000	0.0999	0.0999		V	0.0000	
7	0.3000	0.2997	0.2997	V	V	0.0000	
7	0.5000	0.4995	0.4995		V	0.0000	
7	0.7000	0.6995	0.6994		V	-0.0001	
7	0.9000	0.8993	0.8992		V	-0.0001	
7	1.0000	0.9992	0.9990	V	V	-0.0002	

## Flow Data Form

Mfg	Serial Num	ber Tag	Site	Тес	chnician	Site Vis	it Date Par	ameter	<b>Owner ID</b>
Apex	illegible		COW137	Sa	ndy Grenville	05/30/2	020 Flow	v Rate	000555
					Mfg Serial Number Tfer ID	BIOS 131818 01417		Parameter F	
					Slope		1.00032	ntercept	-0.02240
					Cert Date		2/17/2020 (	CorrCoff	0.99997
DAS 1: A Avg % Diff: 2.60%	A Max % Dif 2.60%	DAS 2: A Avg %	Diff A Max	x % Dif	Cal Factor Z Cal Factor F Rotometer R	ull Scale		0 0.98 1.6	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S	E InputUn	it OutputSigna	all PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.00	l/m	1/m	
primary	leak check	0.000	0.000	0.00	0.000	0.01	l/m	l/m	
primary	test pt 1	1.523	1.540	1.54	0.000	1.50	l/m	l/m	-2.60%
primary	test pt 2	1.523	1.540	1.54	0.000	1.50	l/m	l/m	-2.60%
primary	test pt 3	1.523	1.540	1.54	0.000	1.50	l/m	l/m	-2.60%
-	oonent Leak Tes			Condition Condition				tus pass tus pass	
Sensor Comp	onent Filter Pos	ition		Conditio			Sta	tus Fail	
Sensor Comp	onent Rotomete	er Conditio	n	Conditio	Clean and dry		Sta	tus pass	
	onent Moisture				n No moisture p	resent	Sta	tus pass	
	onent Filter Dist				<b>n</b> 5.5 cm		I	tus pass	
	onent Filter Dep				•n -0.5 cm			tus Fail	
	onent Filter Azir				ion Not tested			tus pass	
Sensor Comp	onent System M	1emo		Conditio	n		Sta	tus pass	

## **Ozone Data Form**

Mfg		Serial Numbe	r Tag Site		Tec	hnician	Site Visit Date	Parame	eter	Owner ID
ThermoElec	tron Inc	1030244797	COW13	37	Sar	ndy Grenville	05/30/2020	Ozone		000689
Slope: Intercept	F		0.00000		Mfg Serial Number	ThermoElectron			er ozone	
CorrCoff:		0.99999 Corr	Coff:	0.00000	-	<b>Ffer ID</b>	01114	 _		
DAS 1:			AS 2:		5	Slope	0.9995	50 Inter	cept	0.29010
_	Diff: A N D%	1ax % Dif A 0.0%	Avg %Diff A	Max % Di	f 7	Cert Date	1/14/202	20 Corr	Coff	0.99999
		[						-		
UseDescri		ConcGroup	Tfer Raw	Tfer Co		Site	Site Unit	RelPer	Dif	AbsDif
prima prima		2	0.44	0.14		-1.42	ppb ppb			-1.56 -1.46
prima	•	3	36.19	35.91		33.91	ppb		-5.73	-1.40
prima	-	4	68.51	68.25		66.25	ppb		-2.97	
prima		5	111.10	110.80		108.00	ppb		-2.61	
-		nt Audit Pressu				n 704 mmHg		Status		
	_	nt Sample Trai				n Good		Status	[	
Sensor C	ompone	nt Minimum dis	stance from road	d met Con	<b>ditio</b>	n True		Status	pass	
Sensor C	ompone	nt Inlet Filter C	ondition	Con	ditio	n Clean		Status	pass	
Sensor C	ompone	nt 26.6 degree	unobstructed ru	ule Con	<b>ditio</b>	n True		Status	pass	
Sensor C	ompone	nt Tree dewline	e >10m or belov	v inlet Con	<b>ditio</b>	n True		Status	pass	
Sensor C	ompone	nt Offset		Con	<b>ditio</b>	<b>n</b> 1.20		Status	pass	
Sensor C	ompone	nt Span		Con	<b>ditio</b>	<b>n</b> 1.007		Status	pass	
Sensor C	ompone	ent Zero Voltage	Э	Con	<b>ditio</b>	n N/A	Status pass		pass	
Sensor C	ompone	nt Fullscale Vo	ltage	Con	<b>ditio</b>	n N/A		Status	pass	
Sensor C	ompone	nt Cell A Freq.		Con	<b>ditio</b>	n 87.4 kHz		Status	pass	
Sensor C	ompone	nt Cell A Noise				n 0.6 ppb		Status	pass	
Sensor C	ompone	Cell A Flow		Con	<b>ditio</b>	n 0.66 lpm		Status	pass	
	•	nt Cell A Press	sure			n 682.9 mmHg		Status	pass	
	-	Cell A Tmp.				n 38.9 C		Status		
	•	nt Cell B Freq.				n 93.4 kHz		Status	[	
	•	nt Cell B Noise	9			n 0.5 ppb		Status	[	
	•	ent Cell B Flow				n 0.65 lpm		Status		
	•	nt Cell B Press	sure			n 682.6 mmHg		Status	· · · · · · · · · · · · · · · · · · ·	
	-	nt Line Loss				n Not tested		Status		
Sensor C	ompone	nt System Men	no	Con	<b>ditio</b>	n		Status	pass	

# Temperature Data Form

Mfg	Serial Number	Tag Site	Т	echni	ician	Site V	isit Date	Param	eter	Owner ID
RM Young	none	COW137		Sandy	Grenville	05/30	/2020	Temper	ature	02934
				Mf	g	Extech	1	Ра	rameter Te	emperature
				Ser	rial Number	H2327	'34	Tf	er Desc. R	ГD
				Tfe	er ID	01227				
DAS 1:	DA	S 2:		Slo	pe		1.0079	7 Inte	rcept	0.12950
Abs Avg Err	Abs Max Err Abs	Avg Err Abs	Max Err	Cer	rt Date		2/14/202	20 Cor	rCoff	1.00000
0.19	0.32									
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmpS	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary	Temp Low Range	0.84	0.70		0.000		0.9	)	С	0.19
primary	Temp Mid Range	24.97	24.64		0.000		24.		С	-0.07
primary	Temp High Range	49.20	48.68	5	0.000		48.	4	C	-0.32
Sensor Con	nponent Shield		Condi	tion N	Noderately clea	an		Status	pass	
Sensor Con	Sensor Component Blower				Condition N/A			Status	pass	
Sensor Component Properly Sited				Condition Properly sited				Status	pass	
Sensor Con	nponent System Memo	)	Condi	Condition				Status	pass	

# Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	COW137	Sandy Grenville	05/30/2020	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperature
Abs Avg Err Abs 0.66	s Max Err Abs Avg 1.31	Err Abs Max Err	Serial Number	H232734	Tfer Desc. RTD	)
			Tfer ID	01227		
			Slope	1.0079	7 Intercept	0.12950
			Cert Date	2/14/202	20 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	30.53	30.16	0.000	30.0	С	-0.21
primary	Temp Mid Range	26.33	25.99	0.000	27.3	С	1.31
primary	Temp Mid Range	30.68	30.31	0.000	29.9	С	-0.46
Sensor Cor	mponent System Memo	)	Condition	Status pass			

# Siting Criteria Form

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

### **Infrastructure Data For**

Site ID	COW137	Technician	Sandy Grenville	Site Visit Date	05/30/2020
Shelter M	ſake	Shelter Model	Shel	ter Size	

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

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazaro	Problem
Flow Rate	COW137	Sandy Grenville	05/30/2020	Filter Depth	Apex	3980		

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: ShelterCleanNotes

There are some wet spots from an apparent leak near the north and south walls.

E-11 C D-4- E	
<b>Field Systems Data Form</b>	

### F-02058-1500-S1-rev002

Site ID	COW137	Tech	nician Sandy Gre	nville	e Site Visit Date 05/3		0/2020		
Site Sponsor	(agency)	EPA/USFS		USC	S Map		Prentiss		
<b>Operating Gr</b>	roup	USFS		Maj	Scale				
AQS #		37-113-9991		Maj	Date				
Meteorologic	al Type	Climatronics							
Air Pollutant	Analyzer	Ozone		QA	PP Latitude				
Deposition M	easurement	dry, wet		QA	PP Longitude				
Land Use		Woodland - mix	ed	QA	<b>PP Elevation</b> 1	Meters			
Terrain		complex		QA	PP Declination	n			
<b>Conforms to</b>	MLM	No		QA	PP Declination	n Date			
Site Telephon	ie	8283697919		Aud	it Latitude				35.060527
Site Address	1	Southeastern Fo	prest Experiment Sta	atio Aud	it Longitude				-83.43034
Site Address	2	3160 Coweeta L	ab Road	Aud	it Elevation				683
County		Macon		Aud	it Declination	l	-5.1		
City, State		, NC			I	Present			
Zip Code		28763		Fire	Extinguisher		Inspected 2019		
Time Zone		Eastern		Firs	t Aid Kit				
Primary Ope	rator			Safe	ty Glasses				
Primary Op.	Phone #			Safe	ty Hard Hat				
Primary Op.	E-mail			Clin	ıbing Belt				
Backup Oper	ator			Secu	rity Fence				
Backup Op.	Phone #			Secu	re Shelter	$\checkmark$			
Backup Op.	E-mail			Stat	le Entry Step	S.▲			
Shelter Work	ting Room 🗹	Make Ekto		Model	8810		Shelter Size	640 cuft	
Shelter Clean		Notes There	are some wet spots	from an a	parent leak ne	ear the nor	th and south wal	ls.	
Site OK	$\checkmark$	Notes							
<b>Driving Direc</b>	ctions								

Fie	eld Sy	stems Data Fo	orm		F-02058-1500-S3-rev002					3-rev002
Site	e ID	COW137	Technician	Sandy Grenville		Site Visit Date	05/30/2020			
1		d speed and direction fluenced by obstruction		as to avoid		N/A				
2	(i.e. wind horizont	d sensors mounted so l sensors should be m ally extended boom > to the prevailing wind	ounted atop the 2x the max dia	e tower or on a		N/A				
3	Are the	tower and sensors plu	mb?		✓	N/A				
4		temperature shields p diated heat sources su			✓					
5	conditions surface a	perature and RH sens ns? (i.e. ground below and not steeply sloped swater should be avoi	sensors should . Ridges, hollow	be natural						
6	Is the so	lar radiation sensor p	lumb?		✓	N/A				
7	Is it site	d to avoid shading, or	any artificial o	r reflected light?		N/A				
8	Is the ra	in gauge plumb?			✓	N/A				
9	Is it sited towers, d	l to avoid sheltering e etc?	ffects from bui	ldings, trees,		N/A				
10	Is the su facing n	rface wetness sensor s orth?	ited with the g	rid surface		N/A				
11	Is it inc	lined approximately 3	0 degrees?		✓	N/A				

# Field Systems Data FormF-02058-1500-S4-rev002

Site	e ID	COW137	Technician	Sandy Grenville		Site Visit Date	05/30/2020	
1 2 3	condition Are all the reporting Are the s	bields for the temper	d? sors operationa ature and RH s	l online, and	<b>&gt; &gt; &gt; &gt;</b>	Temperature only Temperature only		
4	4 Are the aspirated motors working?							
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	free of		N/A		
6	Is the su	rface wetness sensor g	grid clean and u	indamaged?	✓	N/A		
7 8	condition	ensor signal and pow n, and well maintained ensor signal and pow elements and well ma	d? er cable connec		<b>&gt;</b>			

F1	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev00				
Site	e ID	COW137	Technician	Sandy Grenville		Site Visit Date 05/30/2020				
	Siting C	riteria: Are the pollut	ant analyzers ai	nd deposition eq	<u>uipr</u>	nent sited in accordance with 40 CFR 58, Appendix E				
1		ample inlets have at le cted airflow?	ast a 270 degree	e arc of						
2	Are the	sample inlets 3 - 15 me	eters above the	ground?	✓					
3		sample inlets > 1 mete neters from trees?	r from any maj	or obstruction,						
	<b>Polluta</b> r	nt analyzers and depos	ition equipment	t operations and	mai	<u>ntenance</u>				
1		nalyzers and equipme n and well maintained		in good	✓					
2	Are the analyzers and monitors operational, on-line, and reporting data?				✓					
3	Describ	e ozone sample tube.				1/4 teflon by 12 meters				
4	Describ	e dry dep sample tube.				3/8 teflon by 12 meters				
5		ine filters used in the o location)	zone sample lin	e? (if yes		At inlet only				
6	Are sam obstruct	ple lines clean, free of tions?	kinks, moisture	e, and	✓					
7	Is the ze	ero air supply desiccan	t unsaturated?		✓					
8	Are the	re moisture traps in the	e sample lines?			dryer in ozone line				
9	Is there clean?	a rotometer in the dry	deposition filte	er line, and is it		Clean and dry				

~ -

Fi	eld Systems Data Form	F-02058-1500-S6-rev002				
Site	EID COW137 Technician Sandy Grenville	÷	Site Visit Date	05/30/2020		
	DAS, sensor translators, and peripheral equipment operation	ns a	nd maintenance			
1	Do the DAS instruments appear to be in good condition and well maintained?	✓				
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	✓				
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?		Temperature only			
4	Are the signal connections protected from the weather and well maintained?	✓				
5	Are the signal leads connected to the correct DAS channel?	✓				
6	Are the DAS, sensor translators, and shelter properly grounded?	✓				
7	Does the instrument shelter have a stable power source?	✓				
8	Is the instrument shelter temperature controlled?	✓				
9	Is the met tower stable and grounded?		Stable	[	Grounded	
10	Is the sample tower stable and grounded?					
11	Tower comments?					

Field S	Systems Data	Foi	rm				<b>F-0</b> 2	2058-	1500-S7-rev002
Site ID	COW137		Tech	nician	Sandy Grenville	Site Visit Date 05	5/30/2020	)	
<b>Docum</b>	<u>entation</u>								
Does th	<u>ne site have the requir</u>	ed in	strume	ent and	equipment manuals?				
		Yes	No	<b>N/</b>	A		Yes	No	N/A
Wind spee	ed sensor			$\checkmark$	Data logge	er		$\checkmark$	
Wind dire	ection sensor			$\checkmark$	Data logge	er			
Temperat	ure sensor		✓		Strip char	t recorder			
Relative h	umidity sensor			$\checkmark$	Computer			$\checkmark$	
Solar radi	iation sensor			$\checkmark$	Modem			✓	
Surface w	etness sensor			$\checkmark$	Printer				
Wind sens	sor translator				Zero air p	ump		$\checkmark$	
Temperat	ure translator				Filter flow	pump		$\checkmark$	
Humidity	sensor translator			$\checkmark$	Surge prot	tector		✓	
Solar radi	ation translator				UPS				
Tipping b	ucket rain gauge				Lightning	protection device			
Ozone ana			$\checkmark$			-		$\checkmark$	
	k flow controller		$\checkmark$		Shelter air	conditioner		$\checkmark$	
	k MFC power supply								
-		ired a	und mo	ost rece	nt QC documents and	report forms?			
		Pres	sent				Curre	ent	
Station Lo	)g		✓						
SSRF	0								
Site Ops N	Manual		_	Feb 20'	1/				
HASP				Feb 20					
Field Ops	Manual				14				
_	on Reports								
	/p Control Charts								
	e maintenance schedu	le							
Treventiv	e mantenance seneuu	IC .							
1 Is the	e station log properly	comp	oleted o	during	every site visit? 🔽 🕅	linimal information			
2 Are t curre	the Site Status Report ent?	Form	ns beir	ng comp	pleted and 🗹				
	the chain-of-custody for the chain-of-custody for the second second second second second second second second s			rly used	d to document 🔽				

4 Are ozone z/s/p control charts properly completed and current?

Control charts not used	

### **Field Systems Data Form**

Site	ID COW137 Technician Sandy Grenville	Site Visit Date 05/30/2020
1	Site operation procedures Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	
3	Is the site visited regularly on the required Tuesday schedule?	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	

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

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

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

00	Check	Performed
UU	Спеск	Periorineu

**Multi-point Calibrations Automatic Zero/Span Tests** Manual Zero/Span Tests **Automatic Precision Level Tests Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze** Sample Line Check for Dirt/Water Zero Air Desiccant Check

	Frequency	Co
✓	Semiannually	✓
✓	Daily	✓
✓	As needed	✓
✓	Daily	✓
✓	As needed	✓
✓	Weekly	✓
✓	Every 2 weeks	✓
	N/A	✓
✓	Weekly	✓
✓	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	l 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:

### Compliant

F-02058-1500-S8-rev002

#### **Field Systems Data Form** F-02058-1500-S9-rev002 COW137 Technician Sandy Grenville Site Visit Date 05/30/2020 Site ID Site operation procedures Is the filter pack being changed every Tuesday as scheduled? ✓ Filter changed mornings 1 Are the Site Status Report Forms being completed and filed 2 correctly? No longer required Are data downloads and backups being performed as 3 scheduled? SSRF Are general observations being made and recorded? How? 4 ✓ Are site supplies on-hand and replenished in a timely 5 fashion? SSRF, logbook, call-in Are sample flow rates recorded? How? 6 $\checkmark$ Are samples sent to the lab on a regular schedule in a timely 7 fashion? ✓ Unable to confirm Are filters protected from contamination during handling 8

✓

Compliant

9 Are the site conditions reported regularly to the field operations manager or staff?

**QC Check Performed** 

and shipping? How?

### Frequency

Multi-point MFC Calibrations	Semiannually	$\checkmark$
Flow System Leak Checks	✓ Weekly	$\checkmark$
Filter Pack Inspection		
Flow Rate Setting Checks	✓ Weekly	$\checkmark$
Visual Check of Flow Rate Rotometer	✓ Weekly	$\checkmark$
In-line Filter Inspection/Replacement	Semiannually	$\checkmark$
Sample Line Check for Dirt/Water	✓ Weekly	$\checkmark$

## **Field Systems Data Form**

COW137

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

Site ID

Tecl

Technician Sandy Grenville

Site Visit Date 05/30/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	1K2MC12	07049
DAS	Campbell	CR3000	2135	000357
DAS	Campbell	CR3000	2529	000401
elevation	Elevation	1	None	none
Filter pack flow pump	Thomas	107CAB18	001871	02758
Flow Rate	Арех	AXMC105LPMDPC	illegible	000555
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07164
Ozone	ThermoElectron Inc	49i A1NAA	1030244797	000689
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200017	000441
Sample Tower	Aluma Tower	A	none	03499
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	none	02934
UPS	APC	650	unknown	none
Zero air pump	Werther International	C 70/4	000821897	06940

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SND	0152-Sandy	Grenville-05/31/2020				
1	5/31/2020	Computer	Dell	07047	Inspiron 15	BY3MC12
2	5/31/2020	DAS	Campbell	000357	CR3000	2135
3	5/31/2020	Elevation	Elevation	None	1	None
4	5/31/2020	Filter pack flow pump	Thomas	06028	107CAB18	Illegible
5	5/31/2020	Flow Rate	Apex	000861	AXMC105LPMDPCV	illegible
6	5/31/2020	Infrastructure	Infrastructure	none	none	none
7	5/31/2020	Modem	Digi	07187	LR54	unknown
8	5/31/2020	Ozone	ThermoElectron Inc	000743	49i A1NAA	1105347321
9	5/31/2020	Ozone Standard	ThermoElectron Inc	000704	49i A3NAA	1030244816
10	5/31/2020	Sample Tower	Aluma Tower	000148	В	none
11	5/31/2020	Shelter Temperature	Campbell	none	107-L	none
12	5/31/2020	Siting Criteria	Siting Criteria	None	1	None
13	5/31/2020	Temperature	RM Young	06956	41342	024083
14	5/31/2020	Zero air pump	Werther International	06900	PC70/4	000821894

### **DAS Data Form**

DAS Time Max Error: 0.02

Mfg	Serial Nu	mber Site	Т	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	2135	SND	152 S	Sandy Grenville	05/31/2020	DAS	Primary
Das Date:	5 /31/2020	Audit Date	5 /31/2020	Mfg	Datel	Parameter	DAS
Das Time:	13:48:36	Audit Time	13:48:37		15510194		Source generator (D
Das Day:	152	Audit Day	152	Serial Number	15510194	Tier Desc.	Source generator (D
Low Channel:	1	High Channel:	1	Tfer ID	01320		
Avg Diff:	Max Diff:	Avg Diff:	Max Diff:	Slope	1.0000	0 Intercept	0.00000
0.0000	0.0001	0.0000	0.0001	Cert Date	2/13/201	2 CorrCoff	1.00000
				Mfg	Fluke	Parameter	DAS
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.0000	0 Intercept	0.00000
				Cert Date	1/28/202	0 CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	0.0000	0.0001	V	V	0.0001	
7	0.1000	0.0999	0.0999	V	V	0.0000	
7	0.3000	0.2997	0.2997	V	V	0.0000	
7	0.5000	0.4996	0.4996		V	0.0000	
7	0.7000	0.6995	0.6995	V	V	0.0000	
7	0.9000	0.8993	0.8993	V	V	0.0000	
7	1.0000	0.9992	0.9992	V	V	0.0000	

## Flow Data Form

Mfg	Serial	Number Tag	Site	Te	hnician Site Visi		Date Paran	neter	<b>Owner ID</b>	
Apex	illegib	le	SND152	Sa	andy Grenville	e 05/31/2020		Rate	000861	
					Mfg Serial Number Tfer ID	BIOS 131818 01417		Parameter Flo		
					Slope	1	.00032 Int	ercept	-0.02240	
					Cert Date	2/1	7/2020 <b>Co</b>	rrCoff	0.99997	
DAS 1: A Avg % Diff: 1.32%		DAS 2: Dif A Avg %	Diff A Max	x % Dif	Cal Factor Z Cal Factor F Rotometer R	ull Scale	-0.0 0.9			
Desc.	Test ty	pe Input l/n	n Input Corr	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	II PctDifference	
primary	pump off	0.000	0.000	0.00	0.000	-0.01	l/m	1/m		
primary	leak checl	c 0.000	0.000	0.00	0.000	-0.04	l/m	l/m		
primary	test pt 1	1.500	1.520	1.52	0.000	1.50	l/m	l/m	-1.32%	
primary	test pt 2	1.500	1.520	1.51	0.000	1.50	1/m	l/m	-1.32%	
primary	test pt 3	1.500	1.520	1.52	0.000	1.50	l/m	l/m	-1.32%	
Sensor Com	ponent Lea	< Test		Conditio	Condition			<mark>s</mark> pass		
Sensor Com	ponent Tub	ing Condition		Conditio	Condition Good			s pass		
Sensor Com	ponent Filte	r Position		Conditio	Condition Good			s pass		
	1	ometer Conditio	n		Clean and dry		Statu	s pass		
Sensor Comp					See comments	6	Statu	Status pass		
Sensor Component Filter Distance			1	<b>91</b> 4.4 cm			s pass			
Sensor Com					<b>on</b> 1.0 cm			s pass		
Sensor Com					on 270 deg			Status pass		
Sensor Comp	ponent Sys	em Memo		Conditio	on		Statu	<mark>s</mark> pass		

## **Ozone Data Form**

Mfg		Serial Numbe	r Tag Sit	te	Tee	chnician	Site Visit Date	Paramo	eter	Owner ID
ThermoElec	tron Inc	1105347321	S	ND152	Sa	andy Grenville	05/31/2020	Ozone		000743
Slope: Intercept CorrCoff:	(	0.99969 Slop 0.42217 Inter 0.999999 Corr		0.0000	0	Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114			ozone Ozone primary stan
DAS 1: A Avg % D	oiff: A M	DA Iax % Dif A	AS 2: Avg %Di	iff A Max	% Dif	Slope	0.999		•	0.29010
0.0	0%	0.0%				Cert Date	1/14/20	20 Cori	Coff	0.99999
UseDescri primat primat primat	ry ry	ConcGroup 1 2 3	Tfer R 0.52 15.2 36.0	2 2 1 1 1 2	fer Corr 0.23 14.92 35.73	Site           0.57           15.21           36.54	Site Unit ppb ppb ppb	RelPer	Dif 2.24	AbsDif 0.34 0.29
prima		4	68.0		67.81	68.01	ppb		0.29	
primar		5	110.2	24	110.00	110.40 734.0 mmHg	ppb	Status	0.36	
Sensor C	ompone	nt Audit Pressu nt Sample Train	n		Conditio	on Good		Status Status	pass	
Sensor C	ompone	nt Minimum dis	tance from	m road met	Conditio	on True		Status	Pass	
Sensor C	ompone	nt Inlet Filter C	ondition		Conditio	on Clean		Status	pass	
Sensor C	ompone	nt 26.6 degree	unobstrue	cted rule	Conditio	on True		Status	pass	
Sensor C	ompone	nt Tree dewline	e >10m or	below inlet	Conditio	on True		Status	pass	
Sensor C	ompone	nt Offset			Conditio	<b>on</b> -0.50		Status	pass	
Sensor C	ompone	<mark>nt</mark> Span			Conditio	on 1.013		Status	pass	
Sensor C	ompone	nt Zero Voltage	;		Conditio	on N/A		Status	pass	
Sensor C	ompone	nt Fullscale Vo	ltage		Conditio	on N/A	Status pass			
Sensor C	ompone	nt Cell A Freq.			Conditio	on 94.0 kHz		Status	pass	
Sensor C	ompone	nt Cell A Noise			Conditio	on 0.4 ppb		Status	pass	
Sensor C	ompone	nt Cell A Flow			Conditio	0.60 lpm		Status	pass	
Sensor C	ompone	nt Cell A Press	ure		Conditio	on 703.7 mmHg		Status	pass	
Sensor C	ompone	nt Cell A Tmp.			Conditio	on 38.1 C		Status	pass	
Sensor C	ompone	nt Cell B Freq.			Conditio	on 86.6 kHz		Status	pass	
Sensor C	ompone	nt Cell B Noise			Conditio	on 0.6 ppb		Status	pass	
Sensor C	ompone	nt Cell B Flow			Conditio	0.61 lpm		Status	pass	
Sensor C	ompone	nt Cell B Press	ure		Conditio	on 704.3 mmHg		Status	pass	
Sensor C	ompone	nt Line Loss			Conditio	on Not tested		Status	pass	
Sensor C	ompone	nt System Men	10		Conditio	on		Status	pass	

## Temperature Data Form

Mfg	Serial Number	Tag Site	1	ſechni	ician	Site V	isit Date	Param	eter	<b>Owner ID</b>
RM Young	024083	SND152		Sandy	Grenville	05/31	/2020	Temper	ature	06956
				Mf	g	Extech	1	Ра	rameter Te	mperature
				Ser	rial Number	H2327	34	Tf	er Desc. R	D
				Tfe	er ID	01227				
DAS 1:	DAS	S 2:		Slo	ре		1.0079	7 Inte	rcept	0.12950
Abs Avg Err	Abs Max Err Abs	Avg Err Abs	Max Err	Err Cert Date			2/14/2020 CorrCoff		1.00000	
0.40	0.53			<u></u>						
UseDesc.	Test type	InputTmpRaw	InputTmp	Corr.	OutputTmp	Signal	OutputSig	gnalEng	OSE Unit	Difference
primary	Temp Low Range	0.33	0.20		0.000		0.7	7	C	0.53
primary	Temp Mid Range	25.33	25.00	)	0.000		24.	9	С	-0.13
primary	Temp High Range	48.67	48.16	<u>,</u>	0.000		47.	6	С	-0.53
Sensor Con	nponent Shield		Condi	tion C	Clean			Status	pass	
Sensor Component Blower				Condition N/A				Status	pass	
Sensor Component Properly Sited			Condi	Condition Properly sited				Status	pass	
Sensor Con	nponent System Memo	)	Condi	Condition				Status	pass	

# Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	SND152	Sandy Grenville	05/31/2020	Shelter Temperature	none
DAS 1:	DAS 2:		Mfg	Extech	Parameter She	Iter Temperature
Abs Avg ErrAb0.23	s Max Err Abs Avg 0.30	Err Abs Max Err	Serial Number	H232734	Tfer Desc. RTD	)
			Tfer ID	01227		
			Slope	1.0079	7 Intercept	0.12950
			Cert Date	2/14/202	20 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	28.68	28.32	0.000	28.2	С	-0.09
primary	Temp Mid Range	26.37	26.03	0.000	26.3	С	0.3
primary	Temp Mid Range	25.93	25.60	0.000	25.9	С	0.29
Sensor Cor	nponent System Memo	1	Condition	n Status pass			

### **Infrastructure Data For**

Site ID	SND152	Technician Sar	ndy Grenville	Site Visit Date 05/31/2020	]
Shelter	Make	Shelter Model	Shelt	ter Size	
Ekto		8810	640 c	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 Instal	led Status	pass
Sensor Component Power Cables	Condition Good	Status	pass
Sensor Component Shelter Temp Control	Condition Funct	ioning Status	pass
Sensor Component Rotometer	Condition Instal	led 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 Poor	Status	Fail
Sensor Component Shelter Floor	Condition Poor	Status	Fail
Sensor Component Shelter walls	Condition Fair	Status	pass
Sensor Component Excessive mold present	Condition Good	Status	pass
Sensor Component Signal Cable	Condition Fair	Status	pass
Sensor Component Tubing Type	Condition 3/8 te	flon Status	pass
Sensor Component Sample Train	Condition Good	Status	pass

## **Site Visit Comments**

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazaro	Problem	
Flow Rate	SND152	Sandy Grenville	05/31/2020	Moisture Present	Apex	4387			
The filter sample tubing has drops of moisture in low sections outside the shelter.									

## **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

Unable to meet with operator due to COVID policy.

#### 2 Parameter: DasComments

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

#### 3 Parameter: SiteOpsProcedures

Ozone sample line leak checks are no longer performed. A manual zero/span test is performed every two weeks following the inlet filter change.

#### 4 Parameter: SitingCriteriaCom

The site is located on an active research farm with cattle and poultry. Cattle are fed within 100 meters of the site. A new building has been constructed 32 meters south of the sample tower. A Climate Reference Network site is located on the farm on the south side of Hwy 68 which is a better location for the CASTNET site.

#### 5 Parameter: ShelterCleanNotes

The shelter is kept clean, neat, and very well organized. The shelter floor continues to deteriorated with areas of extreme rot just inside the door and along the north wall.

#### 6 Parameter: MetSensorComme

The temperature sensor is mounted to the sample tower and is oriented to the west.

## Siting Criteria Form

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

## Field Systems Data Form

### F-02058-1500-S1-rev002

SND152	Technician Sandy Grenville	Site Visit Date 05/3	1/2020		
Site Sponsor (agency)	EPA	USGS Map	Crossville		
<b>Operating Group</b>	Auburn Univ./private	Map Scale			
AQS #	01-049-9991	Map Date			
Meteorological Type	R.M. Young				
Air Pollutant Analyzer	Ozone, PM10	QAPP Latitude			
<b>Deposition Measurement</b>	dry, wet,	QAPP Longitude			
Land Use	Agriculture, Dairy	QAPP Elevation Meters			
Terrain	plateau, gently rolling	QAPP Declination			
Conforms to MLM	Marginally	QAPP Declination Date			
Site Telephone	(256) 528-7175	Audit Latitude	34.289001		
Site Address 1	Sand Mountain Research & Extension	Audit Longitude	-85.970065		
Site Address 2	13112 Hwy 68	Audit Elevation	349		
County	DeKalb	Audit Declination	-3		
City, State	Crossville, AL	Present			
Zip Code	35962	Fire Extinguisher 🗹	New in 2015		
Time Zone	Eastern	First Aid Kit			
Primary Operator		Safety Glasses			
Primary Op. Phone #		Safety Hard Hat			
Primary Op. E-mail		Climbing Belt			
<b>Backup Operator</b>		Security Fence			
Backup Op. Phone #		Secure Shelter			
Backup Op. E-mail		Stable Entry Steps ✓			
Shelter Working Room	Make Ekto M	odel 8810	Shelter Size 640 cuft		
Shelter Clean		, and very well organized. The nside the door and along the nc	shelter floor continues to deteriorated		
Site OK	Notes				
	I-59 take exit 205, Highway 68, west towa xtension Station just at the east edge of C				

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S3-rev002
Site	e ID	SND152	Technician	Sandy Grenville		Site Visit Date 05/31/2020
1		d speed and direction fluenced by obstructio		as to avoid	✓	2 N/A
2	(i.e. wind horizont	d sensors mounted so d sensors should be mo tally extended boom > to the prevailing wind	ounted atop the 2x the max diar	e tower or on a		2 N/A
3	Are the	tower and sensors plu	mb?		✓	2 N/A
4		temperature shields p diated heat sources su		·		Shield pointing west
5	condition surface a	perature and RH sens ns? (i.e. ground below and not steeply sloped g water should be avoid	sensors should . Ridges, hollov	be natural		
6	Is the so	lar radiation sensor p	lumb?		✓	1 N/A
7	Is it site	d to avoid shading, or	any artificial o	r reflected light?	✓	2 N/A
8	Is the ra	in gauge plumb?			✓	N/A
9	Is it sited towers, o	d to avoid sheltering e etc?	ffects from buil	dings, trees,		2 N/A
10	Is the su facing n	rface wetness sensor s orth?	ited with the gr	rid surface	✓	2 N/A
11	Is it inc	lined approximately 3	0 degrees?		✓	1 N/A

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

The temperature sensor is mounted to the sample tower and is oriented to the west.

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#### 4 = 0.0

### **Field Systems Data Form**

### F-02058-1500-S4-rev002

Site	ID	SND152	Technician	Sandy Grenville		Site Visit Date 05/31/2020
1		e meterological senso		intact, in good		N/A
_		n, and well maintained				
2	Are all the reporting	ne meteorological sens g data?	sors operational	l online, and	V	N/A
3	Are the s	hields for the temper	ature and RH s	ensors clean?	✓	
4	Are the a	spirated motors worl	king?			N/A
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	ree of	✓	N/A
6	Is the sur	rface wetness sensor g	grid clean and u	ndamaged?	✓	N/A
7		ensor signal and pow a, and well maintained		, in good		
8		ensor signal and pow elements and well ma		tions protected	✓	N/A

Fi	eld Sy	stems Data Fo	orm			F-02058-1500-S5-rev002
Site	e ID	SND152	Technician	Sandy Grenville		Site Visit Date 05/31/2020
	Siting C	riteria: Are the pollut	ant analyzers a	nd deposition equ	uipn	nent sited in accordance with 40 CFR 58, Appendix E
1		ample inlets have at le cted airflow?	east a 270 degre	e arc of	✓	
2	Are the	sample inlets 3 - 15 m	eters above the	ground?	✓	
3		sample inlets > 1 meten neters from trees?	er from any maj	jor obstruction,	✓	
	<u>Pollutan</u>	t analyzers and depos	ition equipmen	t operations and	mai	intenance
1		nalyzers and equipme n and well maintained		e in good		
2	Are the reportin	analyzers and monito g data?	rs operational, o	on-line, and	✓	
3	Describe	e ozone sample tube.				1/4 teflon by 12 meters
4	Describe	e dry dep sample tube				3/8 teflon by 12 meters
5		ine filters used in the o location)	ozone sample lir	ne? (if yes		At inlet only
6	Are sam obstruct	ple lines clean, free of ions?	' kinks, moistur	e, and	✓	
7	Is the ze	ro air supply desiccan	at unsaturated?		✓	
8	Are ther	re moisture traps in th	e sample lines?		✓	Flow line only
9	Is there clean?	a rotometer in the dry	v deposition filto	er line, and is it	✓	Clean and dry

4 = 0 0

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Fi	eld Systems Data Form	F-02058-1500-S6-rev002				
Site	e ID SND152 Technician Sandy Grenville	÷	Site Visit Da	te 05/31/2020	)	
	DAS, sensor translators, and peripheral equipment operatio	ons a	nd maintenance			
1	Do the DAS instruments appear to be in good condition and well maintained?					
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	✓				
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	✓	Met sensors only			
4	Are the signal connections protected from the weather and well maintained?	✓				
5	Are the signal leads connected to the correct DAS channel?	✓				
6	Are the DAS, sensor translators, and shelter properly grounded?	✓				
7	Does the instrument shelter have a stable power source?					
8	Is the instrument shelter temperature controlled?	✓				
9	Is the met tower stable and grounded?		Stable		Grounded	
10	Is the sample tower stable and grounded?					
11	Tower comments?		Met tower remove	ed		

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

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

Field S	ystems Data	Fo	rm			<b>F-02</b>	2058-	-1500-S7-rev002
Site ID	SND152		Tech	nician Sa	ndy Grenville Site Visit Date	)5/31/2020	)	
<b>Docume</b>	ntation							
Does the	site have the require	ed in	strume	ent and equ	<u>ipment manuals?</u>			
Solar radia Surface wet Wind senso Temperatur Humidity so Solar radia Tipping but Ozone analy	l sensor tion sensor midity sensor tion sensor tness sensor r translator re translator ensor translator tion translator cket rain gauge	Yes			Data logger Data logger Strip chart recorder Computer Modem Printer Zero air pump Filter flow pump Surge protector UPS Lightning protection device Shelter heater Shelter air conditioner	Yes		
-	MFC power supply				Sherter an conditioner			
		red a	and mo	ost recent C	OC documents and report forms?			
Station Log SSRF Site Ops Ma HASP Field Ops M Calibration	anual Aanual	Pres	sent	Feb 2014 Feb 2014		Curre V V Curre V V V V	ent	
Ozone z/s/p	<b>Control Charts</b>							
Preventive	maintenance schedu	le						
1 Is the s	station log properly o	comp	oleted o	during ever	ry site visit? 🔽			

- **~** Are the Site Status Report Forms being completed and 2
- current? ✓ 3 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 4 current?

### **Field Systems Data Form**

Site	ID	SND152	Technician	Sandy Grenville	Site Visit Date	05/31/2020	
1	Has the	<u>ration procedures</u> site operator attended If yes, when and who i		TNET training			
2		backup operator atten course? If yes, when a					
3	Is the sit	e visited regularly on tl ?	he required Tu	ıesday			
		standard CASTNET op I by the site operator?	perational pro	cedures being			
5	Is the sit the requi	e operator(s) knowledg ired site activities? (inc	geable of, and a luding docum	able to perform entation)			

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

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

Frequency

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

QC	Check	Performed	
----	-------	-----------	--

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

Semiannually	
Daily	
Every 2 weeks	
Daily	
Not performed	
Every 2 weeks	
N/A	
Weekly	
Weekly	

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

✓		
	Call-in only	

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

Ozone sample line leak checks are no longer performed. A manual zero/span test is performed every two weeks following the inlet filter change.

### Compliant

F-02058-1500-S8-rev002

Field S	ystems Data Fo	orm	F-02058-1500-S9-r			
Site ID	SND152	Technician	Sandy Grenville	Site Visit Date	05/31/2020	
Site of	peration procedures					

1	Is the filter pack being changed every	Tuesday as scheduled?	✓	Filter changed mor	inings
2	Are the Site Status Report Forms bei correctly?	ng completed and filed			
3	Are data downloads and backups bei scheduled?	ng performed as		No longer required	
4	Are general observations being made	and recorded? How?		SSRF	
5	Are site supplies on-hand and replen fashion?	ished in a timely			
6	Are sample flow rates recorded? How	v?	✓	SSRF, logbook, ca	II-in
7	Are samples sent to the lab on a regu fashion?	lar schedule in a timely	✓		
8	Are filters protected from contamina and shipping? How?	tion during handling		unable to verify	
9	Are the site conditions reported reguloperations manager or staff?	larly to the field			
QC	Check Performed	Frequency			Compliant
I	Multi-point MFC Calibrations	Semiannually			
]	Flow System Leak Checks	✓ Weekly			
J	Filter Pack Inspection				
]	Flow Rate Setting Checks	Veekly			
1	Visual Check of Flow Rate Rotometer	Veekly			
]	n-line Filter Inspection/Replacement	Semiannually			
5	Sample Line Check for Dirt/Water	Every 2 weeks			

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

Unable to meet with operator due to COVID policy.

## **Field Systems Data Form**

SND152

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

Site ID

Tech

Technician Sandy Grenville

Site Visit Date 05/31/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	BY3MC12	07047
DAS	Campbell	CR3000	2135	000357
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	Illegible	06028
Flow Rate	Apex	AXMC105LPMDPC	illegible	000861
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07187
Ozone	ThermoElectron Inc	49i A1NAA	1105347321	000743
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244816	000704
Sample Tower	Aluma Tower	В	none	000148
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	024083	06956
Zero air pump	Werther International	PC70/4	000821894	06900

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
GAS	GAS153-Sandy Grenville-06/01/2020								
1	6/1/2020	Computer	Dell	07070	Inspiron 15	OF3WC8			
2	6/1/2020	DAS	Campbell	000635	CR3000	4934			
3	6/1/2020	Elevation	Elevation	None	1	None			
4	6/1/2020	Filter pack flow pump	Thomas	04858	107CAB18	608102A			
5	6/1/2020	Flow Rate	Арех	000643	AXMC105LPMDPCV	illegible			
6	6/1/2020	Infrastructure	Infrastructure	none	none	none			
7	6/1/2020	Modem	Digi	07185	LR54	unknown			
8	6/1/2020	Ozone	ThermoElectron Inc	000737	49i A1NAA	1105347312			
9	6/1/2020	Ozone Standard	ThermoElectron Inc	000434	49i A3NAA	CM08200010			
10	6/1/2020	Sample Tower	Aluma Tower	000138	В	none			
11	6/1/2020	Shelter Temperature	Campbell	none	107-L	none			
12	6/1/2020	Siting Criteria	Siting Criteria	None	1	None			
13	6/1/2020	Temperature	RM Young	04319	41342	4038			
14	6/1/2020	UPS	APC	missing	BP6505	NB0009260535			
15	6/1/2020	Zero air pump	Werther International	06865	C 70/4	000814277			

### **DAS Data Form**

DAS Time Max Error:

0

Mfg	Serial Nu	nber Site	T	echnician	Site Visit Date	Parameter	Use Desc.
Campbell	4934	GAS	153 S	Sandy Grenville	06/01/2020	DAS	Primary
Das Date:	6 /1 /2020	Audit Date	6 /1 /2020	Mfg	Datel	Parameter	DAS
Das Time:	12:13:00	Audit Time	12:13:00	Serial Number	15510194	Tfer Desc.	Source generator (D
Das Day:	153	Audit Day	153	Tfer ID	01320	]	· · · ·
Low Channel: Avg Diff:	Max Diff:	High Channel: Avg Diff:	: Max Diff:	Slope	1.00000	Intercept	0.00000
0.0000	0.0001	0.0000	0.0001	Cert Date	2/13/2012		1.00000
				Mfg	Fluke	Parameter	
				Serial Number	95740135	Tfer Desc.	DVM
				Tfer ID	01311		
				Slope	1.00000	Intercept	0.00000
				Cert Date	1/28/2020	<b>CorrCoff</b>	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
7	0.0000	-0.0001	-0.0001	V	V	0.0000	
7	0.1000	0.0998	0.0998		V	0.0000	
7	0.3000	0.2996	0.2996		V	0.0000	
7	0.5000	0.4996	0.4996		V	0.0000	
7	0.7000	0.6995	0.6994		V	-0.0001	
7	0.9000	0.8995	0.8994		V	-0.0001	
7	1.0000	0.9993	0.9993	V	V	0.0000	

## Flow Data Form

Mfg	Serial Num	ber Tag	Site Technician		Site Visit I	Date Param	eter	<b>Owner ID</b>	
Арех	x illegible GAS153		Sa	ndy Grenville	06/01/2020	D Flow R	ate	000643	
					Mfg Serial Number	BIOS 131818		arameter F fer Desc. B	
					Tfer ID Slope			ercept	-0.02240
DAS 1: A Avg % Diff: 0.88%	A Max % Dif 1.32%	Diff A Max	x % Dif	Cert Date Cal Factor Z Cal Factor F Rotometer R	ero	-0.0		0.99997	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSigna	all PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.01	l/m	l/m	
primary	test pt 1	1.484	1.510	1.51	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 2	1.484	1.510	1.51	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.494	1.520	1.51	0.000	1.50	l/m	l/m	-1.32%
-	oonent Leak Test				Condition Good			pass pass	
Sensor Comp	onent Filter Pos	ition		Conditio	n Good		Status	pass	
Sensor Comp	onent Rotomete	r Conditior	ו	Conditio	Clean and dry		Status	pass	
Sensor Comp	onent Moisture	Present		Conditio	n See comments	3	Status	pass	
Sensor Component Filter Distance			Conditio	2.0 cm	Status	pass			
Sensor Comp	onent Filter Dep	th		Conditio	2.5 cm	Status	pass		
Sensor Comp	onent Filter Azir	nuth		Conditio	90 deg	Status	pass		
Sensor Comp	onent System M	lemo		Conditio	on		Status	pass	

## **Ozone Data Form**

Mfg	8	Serial Numbe	r Tag Site		Тео	chnician	Site Visit Date	Parame	ter	Owner ID	
ThermoElectro	on Inc	1105347312	GAS1	53	Sa	indy Grenville	06/01/2020	Ozone		000737	
Slope: Intercept CorrCoff:				0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114			er ozone	
DAS 1: DAS 2: A Avg % Diff: A Max % Dif A Avg %Diff A Max %					Slope Cert Date	0.99950 Inte		cept Coff	0.29010		
0.0%	6	0.0%									
UseDescript primary primary		ConcGroup 1 2	Tfer Raw 0.37 15.20		Fer Corr 0.07 14.91	Site -0.23 13.57	Site Unit ppb ppb	RelPerDif		AbsDif -0.3 -1.34	
primary	· · · · ·		35.50		35.22	32.77	ppb	-7.21			
primary primary		4 5	68.50 109.50			64.98 104.90	ppb ppb	-4.89 -4.07			
· · ·	1	t Audit Pressu				743.5 mmHg	PF0	Status			
	-										
Sensor Component Sample Train				Condition Good			Status pass				
Sensor Con	Sensor Component Minimum distance from road met			ad met	Condition True			Status	pass		
Sensor Component Inlet Filter Condition				Condition Clean			Status	pass			
Sensor Con	Sensor Component 26.6 degree unobstructed rule			rule	Condition True			Status	s pass		
Sensor Component Tree dewline >10m or below in			ow inlet	Condition True			Status	18 pass			
Sensor Con	Sensor Component Offset			Cor		<b>0.000</b>	Status	s pass			
Sensor Component Span				Condition 1.0				Status	pass		
Sensor Component		t Zero Voltage	Zero Voltage			on N/A		Status	Status pass		
Sensor Component		Fullscale Voltage			Conditio	on N/A		Status	pass		
Sensor Con	Sensor Component Ce		ell A Freq.			on 85.4 kHz		Status pass			
Sensor Con	Sensor Component Cell A Noise		!	Con		tion 0.9 ppb		Status pass			
Sensor Con	nponen	t Cell A Flow		Cond		tion 0.66 lpm		Status	s pass		
Sensor Con	Sensor Component Cell A Pressure		ure	Cond		<b>on</b> 701.4 mmHg		Status pass			
Sensor Component Cell A Tmp.					Conditio	n 36.0 C		Status	Status pass		
Sensor Component Cell B Freq.			Conditio	ndition 97.9 kHz			pass				
Sensor Component Cell B Noise					Conditio	on 1.1 ppb		Status	Status pass		
Sensor Component Cell B Flow					Conditio	on 0.71 lpm		Status	pass		
Sensor Component Cell B Pressure			ure		Conditio	<b>on</b> 702.3 mmHg		Status pass			
Sensor Component Line Loss					Conditio	ion Not tested		Status	pass		
Sensor Component System Memo			no		Conditio	on		Status	pass		

## **Temperature Data Form**

Mfg	Serial Number	Tag Site	Т	echni	ician	Site V	isit Date	Param	eter	Owner ID	
RM Young	4038	GAS153	GAS153		Sandy Grenville		06/01/2020 T		ature	04319	
		Mfg			Extech Pa		arameter Temperature				
				Ser	rial Number	H232734 Tf			fer Desc. RTD		
					Tfer ID		01227				
DAS 1:		Slope			1.00797 Inte		ercept 0.12950				
Abs Avg Err	Max Err	Cer	rt Date		2/14/2020 CorrCoff 1.00000						
0.25	0.40										
UseDesc.	Test type	Test type InputTmpRaw		Corr.	OutputTmpS	Signal OutputSignal		gnalEng	OSE Unit	Difference	
primary	Temp Low Range	0.31	0.18		0.000		0.5		C	0.28	
	Temp Mid Range	25.12	24.79		0.000		24.9		С	0.08	
primary	Temp High Range	High Range 48.95			48.43 0.000			48.0		-0.4	
Sensor Com	ponent Shield	Condi	Condition Moderately clean				Status	pass			
Sensor Component Blower				Condition N/A				Status pass			
Sensor Component Properly Sited				Condition Properly sited				Status	tus pass		
Sensor Com	ponent System Memo	Condi	Condition				Status pass				

# Shelter Temperature Data For

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	GAS153	Sandy Grenville	06/01/2020	Shelter Temperature	none
DAS 1:	<b>DAS 2:</b>		Mfg	Extech	Parameter She	Iter Temperature
Abs Avg Err Ab			Serial Number	H232734	Tfer Desc. RTD	)
			Tfer ID	01227		
			Slope	1.0079	7 Intercept	0.12950
			Cert Date	2/14/202	0 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	28.56	28.21	0.000	27.6	С	-0.66
primary	Temp Mid Range	24.60	24.28	0.000	25.1	С	0.85
primary	Temp Mid Range	27.72	27.37	0.000	26.9	С	-0.5
Sensor Con	nponent System Memo	1	Condition		Status	pass	

#### **Infrastructure Data For**

Site ID	GAS153	Technician	Sandy Grenville	Site Visit Date	06/01/2020
Shelter M	lake	Shelter Model	Sh	elter Size	
Ekto		8810	640	) cuft	
	MARKA CONTRACTOR AND			2010/02/02/02/02/02/02/02/02/02/02/02/02/02	

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

# Siting Criteria Form

Condition	Status pass
Condition	Status pass
	Condition         Condition

<b>Field Systems Data Form</b>	

### F-02058-1500-S1-rev002

Site ID GAS153	Technician Sandy Grenville	lle Site Visit Date 06/01/2020			
Site Sponsor (agency)	EPA	USGS Map	Hollonville		
		Map Scale			
<b>Operating Group</b>	UGA	-			
AQS #	13-231-9991	Map Date			
Meteorological Type	R.M. Young				
Air Pollutant Analyzer	Ozone	QAPP Latitude			
<b>Deposition Measurement</b>	dry, wet	QAPP Longitude			
Land Use	agriculture, woodland - mixed	<b>QAPP Elevation Meters</b>			
Terrain	gently rolling	QAPP Declination			
Conforms to MLM	Yes	<b>QAPP Declination Date</b>			
Site Telephone	(770) 229-8542	Audit Latitude	33.181173		
Site Address 1	Bledsoe Farm, GA Experiment Station	Audit Longitude	-84.410054		
Site Address 2	1913 Jackson road	Audit Elevation	265		
County	Pike	Audit Declination	-4		
City, State	Williamson, GA	Present			
Zip Code	30292	Fire Extinguisher 🔽	New in 2015		
Time Zone	Eastern	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	Not locked		
Backup Op. E-mail		Stable Entry Steps ✓			
Shelter Working Room ✓	Make Ekto Me	odel 8810	Shelter Size 640 cuft		
Shelter Clean	Notes				
Site OK	Notes				
	-75 take exit 205 (Rt 16) west to Griffin.				
the dir	ke the next exit (Rt 362) west toward Will t road marked Blanton Mill Road, approxi ne farm office and sheds on the north side	mately 0.9 miles to the gated B			

Fie	eld Sy	stems Data Fo	orm				<b>F-020</b>	58-15	500-83	-rev002
Site	e ID	GAS153	Technician	Sandy Grenville		Site Visit Date	06/01/2020		]	
1 2	being inf Are wind (i.e. wind horizont	d speed and direction fluenced by obstructio d sensors mounted so l sensors should be m ally extended boom > to the prevailing wind	ons? as to minimize ounted atop the 2x the max diar	tower effects? e tower or on a		N/A N/A				
3	Are the	tower and sensors plu	mb?		✓	N/A				
4		temperature shields p diated heat sources su			✓					
5	conditions surface a	perature and RH sens ns? (i.e. ground below and not steeply sloped swater should be avoi	y sensors should . Ridges, hollow	l be natural						
6	Is the so	lar radiation sensor p	lumb?		✓	N/A				
7	Is it site	l to avoid shading, or	any artificial o	r reflected light?		N/A				
8	Is the ra	in gauge plumb?			✓	N/A				
9	Is it sited towers, o	l to avoid sheltering e etc?	ffects from buil	ldings, trees,	✓	N/A				
10	Is the su facing n	rface wetness sensor s orth?	sited with the g	rid surface	✓	N/A				
11	Is it incl	lined approximately 3	0 degrees?			N/A				

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

Site ID

1

2

•						
ID	GAS153	Technician Sandy C	Grenville	Site Visit Date	06/01/2020	
	he meterological sensors on, and well maintained	• • •	n good 🔽			
Are all	the meteorological sense	ors operational online,	, and 🗹			

	reporting data?		
3	Are the shields for the temperature and RH sensors clean?	✓	Moderately clean
4	Are the aspirated motors working?	✓	N/A
5	Is the solar radiation sensor's lens clean and free of scratches?	✓	N/A
6	Is the surface wetness sensor grid clean and undamaged?	$\checkmark$	N/A
7	Are the sensor signal and power cables intact, in good	✓	

Are the sensor signal and power cable connections protected V N/A 8 from the elements and well maintained?

# condition, 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:

### F-02058-1500-S4-rev002

Fi	eld Systems Data Form		F-02058-1500-S5-rev002
Site	GAS153 Technician Sandy Grenville		Site Visit Date 06/01/2020
	Siting Criteria: Are the pollutant analyzers and deposition eq	uipr	nent sited in accordance with 40 CFR 58, Appendix E
1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	✓	
2	Are the sample inlets 3 - 15 meters above the ground?	✓	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?		
	Pollutant analyzers and deposition equipment operations and	mai	intenance
1	Do the analyzers and equipment appear to be in good condition and well maintained?	✓	
2	Are the analyzers and monitors operational, on-line, and reporting data?	✓	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)		At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	✓	Moisture in tubing only
7	Is the zero air supply desiccant unsaturated?	✓	
8	Are there moisture traps in the sample lines?	✓	dryer in ozone line
9	Is there a rotometer in the dry deposition filter line, and is it clean?		Clean and dry

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

Fi	eld Sy	stems Data Fo	orm		<b>F-0</b> 2	2058-15	00-S6-rev002	
Site	e ID	GAS153	Technician Sandy Grenville		Site Visit Date	06/01/2020	)	
	DAS, se	nsor translators, and g	peripheral equipment operation	<u>1s a</u>	<u>nd maintenance</u>			
1		DAS instruments appe intained?						
2		he components of the backup, etc)	DAS operational? (printers,					
3		nalyzer and sensor sig g protection circuitry?	nal leads pass through	✓	Met sensors only			
4	Are the signal connections protected from the weather and well maintained?			✓				
5	Are the	signal leads connected	to the correct DAS channel?	✓				
6	Are the grounde		rs, and shelter properly	✓				
7	Does the	e instrument shelter ha	ave a stable power source?	✓				
8	Is the in	strument shelter temp	erature controlled?	✓				
9	Is the m	et tower stable and gr	ounded?		Stable		Grounded	
10	Is the sa	mple tower stable and	grounded?					
11	Tower c	omments?			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								<b>F-02</b>	F-02058-1500-S7-rev002			
Site ID	GAS153		Technic	<mark>cian</mark> Sar	ndy Grenville	Site	Visit Date	)6/01/2020	0			
Document	tation											
Does the s	ite have the require	ed ins	strument	and equ	ipment manuals	<u>?</u>						
Solar radiati Tipping buck Ozone analy Filter pack fi Filter pack M	sensor on sensor e sensor nidity sensor on sensor translator e translator on translator on translator on translator ket rain gauge zer low controller	Yes □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □		N/A V V V V V V V V V V V V V	Shelter h Shelter a	ger rt recor r pump w pump otector g protect eater ir condit	tion device tioner	Yes	N• ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼	N/A  V		
Does the	site have the requi			<u>recent Q</u>	<u>C documents an</u>	<u>d report</u>	<u>t forms?</u>	C				
-	nual anual	6 [ [ [ [ [ [										
	ation log properly o Site Status Report	-			-							
	? chain-of-custody fo transfer to and fror			used to	document 🔽							
4 Are ozo current	ne z/s/p control cha ?	rts p	roperly o	complete	d and	Control o	charts not us	ed				
	additional explanat an-made, that may					) regard	ling conditio	ons listed	above,	or any oth	er featur	es,

Site	ID	GAS153	Technician	Sandy Grenville	Site Visit Date	06/01/2020	
1	Has the	<u>ration procedures</u> site operator attended If yes, when and who i		TNET training			
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?						
3	Is the sit schedule	e visited regularly on t ?	he required T	ıesday			
		standard CASTNET of l by the site operator?	perational pro	cedures being			
5		e operator(s) knowledg ired site activities? (inc		· · · · · · · · · · · · · · · · · · ·			

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

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

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

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

- **1** Do multi-point calibration gases go through the complete sample train including all filters?
- 2 Do automatic and manual z/s/p gasses go through the complete sample train including all filters?

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

	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:

It was reported that the ozone inlet filter is replaced every two weeks, and a manual zero test is performed every week.

# Compliant

\_\_\_\_\_

### F-02058-1500-S8-rev002

Field S	Systems Data Fo	orm	F-02058-1500-S9-rev002					
Site ID	GAS153	Technician	Sandy Grenville	Site Visit Date	06/01/2020			
<u>Site o</u>	peration procedures							
1 Is the	filter pack being change	d every Tuesday	as scheduled? 🗹 🖡	ilter changed morir	nings			

2	Are the Site Status Report Forms bei correctly?	ng completed and filed				
3	Are data downloads and backups bei scheduled?	ng performed as		No longer required	1	
4	Are general observations being made	and recorded? How?	✓	SSRF, call-in		
5	Are site supplies on-hand and replen fashion?	ished in a timely	✓			
6	Are sample flow rates recorded? How	v?	✓	SSRF, logbook, ca	all-in	
7	Are samples sent to the lab on a regu fashion?	lar schedule in a timely	✓			
8	Are filters protected from contamina and shipping? How?	tion during handling	✓	unable to verify		
9	Are the site conditions reported regu operations manager or staff?	larly to the field				
QC	Check Performed	Frequency			Compliant	
]	Multi-point MFC Calibrations	Semiannually				
]	Flow System Leak Checks	✓ Weekly			$\checkmark$	
]	Filter Pack Inspection					
]	Flow Rate Setting Checks					
1	Visual Check of Flow Rate Rotometer Veekly					
]	<b>In-line Filter Inspection/Replacement</b>	Semiannually				

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

✓

✓ Weekly

Unable to meet with operator due to COVID policy.

Sample Line Check for Dirt/Water

GAS153

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

Site ID

Tecl

Technician Sandy Grenville

Site Visit Date 06/01/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	OF3WC8	07070
DAS	Campbell	CR3000	4934	000635
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	608102A	04858
Flow Rate	Арех	AXMC105LPMDPC	illegible	000643
Infrastructure	Infrastructure	none	none	none
Modem	Digi	LR54	unknown	07185
Ozone	ThermoElectron Inc	49i A1NAA	1105347312	000737
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200010	000434
Sample Tower	Aluma Tower	B	none	000138
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4038	04319
UPS	APC	BP6505	NB0009260535	missing
Zero air pump	Werther International	C 70/4	000814277	06865

# Site Inventory by Site Visit

Site Visit Date		Parameter	eter Mfg		Model Number	Serial Number
FOR	605-Martir	1 Valvur-06/03/2020				
1	6/3/2020	DAS	Campbell	49922	CR1000	illegible
2	6/3/2020	elevation	Elevation	none	none	none
3	6/3/2020	Flow Rate	Omega	none	FMA6518ST-RS232	394013-3
4	6/3/2020	Infrastructure	Infrastructure	none	none	none
5	6/3/2020	Precipitation	Handar	none	444A	2998
6	6/3/2020	siting criteria	Siting Criteria	none	none	None
7	6/3/2020	Wind Direction	Met One	illegible	024	J5213
8	6/3/2020	Wind Speed	Met One	none	014	K2278

## Flow Data Form

Mfg	Serial Num	ber Tag	Site	Te	echnician Site Visi		sit Date	Paran	neter	Owner ID
Omega	394013-3		FOR605	Ma	artin Valvur	06/03/2	2020	Flow F	Rate	none
					Mfg	BIOS		Parameter Flow		
					Serial Number	122974		T	fer Desc. BIC	S 220-H
					Tfer ID	01416				
					Slope		1.000	00 Int	ercept	0.00000
					Cert Date		5/6/20	20 <b>Co</b>	rrCoff	1.00000
DAS 1:		DAS 2:		I	Cal Factor Z	lero		0.	18	
A Avg % Diff:	A Max % Dif	A Avg %	Diff A Max	x % Dif	Cal Factor F	ull Scale		1.0	02	
1.46%	1.69%				Rotometer Reading:				0	
Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S	SE Inp	utUnit	OutputSignalH	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.18		l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.18		l/m	l/m	
primary	test pt 1	2.951	2.950	2.98	0.000	3.00		l/m	l/m	1.69%
primary	test pt 2	2.957	2.960	2.97	0.000	3.00		l/m	l/m	1.35%
primary	test pt 3	2.957	2.960	2.96	0.000	3.00		l/m	l/m	1.35%
Sensor Com	oonent Leak Tes	t		Conditio	on			Statu	<mark>s</mark> pass	
Sensor Com	onent Tubing C	ondition		Conditio	ondition Good			Statu		
Sensor Comp	ponent Filter Pos	ition		Conditio	on Good			Statu	s pass	
Sensor Com	onent Rotomete	r Conditio	n	Conditio	on N/A			Statu	s pass	
Sensor Com	onent Moisture	Present		Conditio	on No moisture p	resent		Statu	s pass	
Sensor Com	onent Filter Dist	ance		Conditio	tion 4.5 cm			Statu	s pass	
Sensor Comp	onent Filter Dep	oth		Conditio	ion 3.0 cm			Statu	s pass	
Sensor Comp	onent Filter Azir	nuth		Conditio	ion 90 deg			Statu	<mark>s</mark> pass	
Sensor Com	oonent System M	1emo		Conditio	tion			Statu	s pass	

# 2 Meter Temperature Data Form

**Calc. Difference** 

Mfg	Serial Number Ta	g Site	r	Technicia	an	Site Vis	sit Date	Parameter		Owner ID
Campbell 124		FOR605	FOR605		Martin Valvur		06/03/2020 Tem		ure2meter	none
				Mfg		Fluke		Para	meter Tem	perature
				Serial	Number	3275143	3	Tfer	Desc. RTD	
				Tfer I	D	01229		]		
DAS 1:	DAS 2	:		Slope			1.00026	Interco	ept	-0.01710
Abs Avg Err Ab	s Max Err Abs A	vg Err Abs	Max Err	rr Cert Date			1/29/2020 CorrCoff		off	1.00000
0.1	0.18									
UseDescription	Test type Inp	utTmpRaw	InputTmpC	Corrected	OutputTn	pSignal	OutputS	ignalEng	OSE Unit	Difference
primary T	emp Low Rang	0.19		0.21		0.000		0.13	С	-0.08
primary T	emp Mid Range	25.43		25.44		0.000		25.39	С	-0.05
primary T	emp High Rang	49.05		49.05		0.000		49.23	С	0.18
Sensor Compone	ent Shield		Cond	ition Clea	an			Status pa	ass	
Sensor Component Properly Sited			Cond	Condition Properly sited				Status pass		
Sensor Component Blower			Cond	Condition N/A				Status pass		
Sensor Component System Memo			Cond	Condition Sta				Status pass		

# Siting Criteria Form

Condition	Status pass
Condition	Status pass
	Condition         Condition

#### **Infrastructure Data For**

Site ID	FOR605	Technician M	lartin Valvur Site Visit Date 06/03/2020
Shelter M	ſake	Shelter Model	Shelter Size

Sensor Component Sar	mple Tower Type	Condition	Pole type	Status	pass
Sensor Component Con	nduit	Condition	Good	Status	pass
Sensor Component Me	t Tower	Condition	Good	Status	pass
Sensor Component Mo	isture Trap	Condition	Installed	Status	pass
Sensor Component Pov	wer Cables	Condition	Good	Status	pass
Sensor Component She	elter Temp Control	Condition	N/A	Status	pass
Sensor Component Rot	tometer	Condition	Not installed	Status	Fail
Sensor Component Sar	mple Tower	Condition	Good	Status	pass
Sensor Component She	elter Condition	Condition	Good	Status	pass
Sensor Component She	elter Door	Condition	Good	Status	pass
Sensor Component She	elter Roof	Condition	N/A	Status	pass
Sensor Component She	elter Floor	Condition	N/A	Status	pass
Sensor Component She	elter walls	Condition	N/A	Status	pass
Sensor Component Exc	cessive mold present	Condition	N/A	Status	pass
Sensor Component Sig	nal Cable	Condition	Good	Status	pass
Sensor Component Tut	bing Type	Condition	3/8 teflon	Status	pass
Sensor Component Sar	mple Train	Condition	Good	Status	pass

# **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

The dry deposition sample height is approximately 6 meters and not 10 meters. The observation section of the SSRF is not used.

#### 2 Parameter: DocumentationCo

There is no documentation available at the site since there is no place to store documents. The site does not have a computer or shelter other than the small enclosure. The site operator completes a site checklist which remains in his vehicle. Information from the checklist is later filed at his office. Per instruction from ARS the COC portion of the SSRF is not being used.

#### 3 Parameter: SitingCriteriaCom

The site is located in a wellfield with oil and gas operations nearby.

#### 4 Parameter: ShelterCleanNotes

This is a small footprint site with instruments mounted in enclosure on tripod tower.

#### 5 Parameter: PollAnalyzerCom

The enclosure protecting the dry deposition filter pack is much smaller in diameter than the normal filter pack enclosure. The geometry of the enclosure may effect particulate collection making data not directly comparable to other CASTNET sites.

#### 6 Parameter: MetOpMaintCom

The temperature sensor is now separate from the humidity sensor. The relative humidity measurement is 8 meters above the ground, and the temperature measurement is 2.2 meters above ground.

### F-02058-1500-S1-rev002

Site ID FOR605	Technician Martin Valvur	Site Visit Date 06/0	3/2020
<b>G</b> *( <b>G</b> ( ))	EPA	USGS Map	
		-	
<b>Operating Group</b>	BLM	Map Scale	
AQS #		Map Date	
Meteorological Type	Met One		
Air Pollutant Analyzer		QAPP Latitude	
<b>Deposition Measurement</b>	dry	QAPP Longitude	
Land Use	Range	<b>QAPP Elevation Meters</b>	
Terrain	Rolling	<b>QAPP Declination</b>	
Conforms to MLM	Marginally	QAPP Declination Date	
Site Telephone		Audit Latitude	44.33927
Site Address 1		Audit Longitude	-105.920275
Site Address 2		Audit Elevation	1402
County	Campbell	Audit Declination	9.3
City, State	Gillette, WY	Present	
City, State Zip Code	Gillette, WY 82716	Present	
Zip Code	82716	Fire Extinguisher	
Zip Code Time Zone	82716	Fire Extinguisher	
Zip Code Time Zone Primary Operator	82716	Fire ExtinguisherFirst Aid KitSafety Glasses	
Zip Code Time Zone Primary Operator Primary Op. Phone #	82716	Fire ExtinguisherFirst Aid KitSafety GlassesSafety Hard Hat	
Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail	82716	Fire ExtinguisherFirst Aid KitSafety GlassesSafety Hard HatClimbing Belt	
Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator	82716	Fire ExtinguisherFirst Aid KitSafety GlassesSafety Hard HatClimbing BeltSecurity Fence	
Zip CodeTime ZonePrimary OperatorPrimary Op. Phone #Primary Op. E-mailBackup OperatorBackup Op. Phone #Backup Op. E-mail	82716 Mountain	Fire ExtinguisherFirst Aid KitSafety GlassesSafety Hard HatClimbing BeltSecurity FenceSecure Shelter	
Zip Code Time Zone Primary Operator Primary Op. Phone # Primary Op. E-mail Backup Operator Backup Op. Phone # Backup Op. E-mail	82716 Mountain	Fire ExtinguisherFirst Aid KitSafety GlassesSafety Hard HatClimbing BeltSecurity FenceSecure ShelterStable Entry StepsOdel	
Zip CodeTime ZonePrimary OperatorPrimary Op. Phone #Primary Op. E-mailBackup OperatorBackup Op. Phone #Shelter Working RoomShelter Clean	82716 Mountain	Fire ExtinguisherFirst Aid KitSafety GlassesSafety Hard HatClimbing BeltSecurity FenceSecure ShelterStable Entry StepsOdel	

Fi	eld Systems Data Form		F-02058-1500-S3-rev002		
Sit	FOR605 Technician Martin Valvur		Site Visit Date 06/03/2020		
1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?				
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)				
3	Are the tower and sensors plumb?	✓			
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	✓			
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)				
6	Is the solar radiation sensor plumb?	✓			
7	Is it sited to avoid shading, or any artificial or reflected light	? ✓			
8	Is the rain gauge plumb?	✓			
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?		45 degree rule violation		
10	Is the surface wetness sensor sited with the grid surface facing north?	✓	N/A		
11	Is it inclined approximately 30 degrees?	✓	N/A		

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

### F-02058-1500-S4-rev002

Site	e ID	FOR605	Technician	Martin Valvur		Site Visit Date	06/03/2020	
1 2	condition Are all th reporting		ors operational	l online, and	V			
3		shields for the temperative spirated motors work		ensors clean?	<ul> <li></li> </ul>	N/A		
5	Is the sol scratches	ar radiation sensor's l s?	ens clean and f	ree of				
6	Is the su	rface wetness sensor g	rid clean and u	ndamaged?	✓	N/A		
7		sensor signal and powe n, and well maintained		, in good	✓			
8		sensor signal and powe elements and well ma		tions protected				

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

The temperature sensor is now separate from the humidity sensor. The relative humidity measurement is 8 meters above the ground, and the temperature measurement is 2.2 meters above ground.

Field Systems Data Form					F-02058-1500-S5-rev002
Site	ID	FOR605	Technician Martin Valvur		Site Visit Date 06/03/2020
	Siting (	Criteria: Are the pollu	tant analyzers and deposition eq	uipı	ment sited in accordance with 40 CFR 58, Appendix E
1		sample inlets have at l icted airflow?	least a 270 degree arc of	✓	
2	Are the	e sample inlets 3 - 15 n	neters above the ground?	✓	
3		e sample inlets > 1 met meters from trees?	ter from any major obstruction,		
	<u>Polluta</u>	nt analyzers and depo	osition equipment operations and	l ma	<u>uintenance</u>
1		analyzers and equipm on and well maintaine	ent appear to be in good cd?		
2		e analyzers and monitong data?	ors operational, on-line, and	✓	
3	Descrit	be ozone sample tube.			N/A
4	Describ	oe dry dep sample tub	<b>e.</b>		3/8 teflon by 8 meters
5		line filters used in the e location)	ozone sample line? (if yes		N/A
6	Are sai obstruc		of kinks, moisture, and		
7	Is the z	ero air supply desicca	nt unsaturated?	✓	N/A
8	Are the	ere moisture traps in t	he sample lines?		

9 Is there a rotometer in the dry deposition filter line, and is it clean?

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

The enclosure protecting the dry deposition filter pack is much smaller in diameter than the normal filter pack enclosure. The geometry of the enclosure may effect particulate collection making data not directly comparable to other CASTNET sites.

Field Systems Data Form						F-02058-1500-S6-rev			
Site	e ID	FOR605	Technician	Martin Valvur		Site Visit Date	06/03/2020	)	
	DAS, se	ensor translators, and	peripheral equi	pment operation	<u>ıs ar</u>	nd maintenance			
1		DAS instruments appo intained?	ear to be in good	condition and					
2		the components of the , backup, etc)	DAS operation	al? (printers,	✓				
3		analyzer and sensor si ng protection circuitry		hrough	✓				
4		signal connections pr intained?	otected from the	e weather and	✓				
5	Are the	signal leads connecte	d to the correct	DAS channel?	✓				
6	Are the ground	DAS, sensor translate ed?	ors, and shelter j	properly					
7	Does th	e instrument shelter h	ave a stable pov	ver source?	✓	Solar power			
8	Is the in	nstrument shelter tem	perature control	led?	✓	N/A			
9	Is the n	net tower stable and g	rounded?			Stable		Grounded	
10	Is the s	ample tower stable an	d 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	Fo	rm				<b>F-0</b> 2	2058-	-1500-87-	rev002
Site ID	FOR605		Techni	i <mark>cian</mark> Marti	in Valvur	Site Visit Date	06/03/2020	)		
Docu	mentation									
Does	<u>the site have the requir</u>	ed in	strumen	<u>t and equi</u>	pment manuals?	<u> </u>				
Wind di Tempera Relative Solar ra Surface Wind se Tempera Humidit Solar ra Tipping Ozone a Filter pa	eed sensor rection sensor ature sensor humidity sensor diation sensor wetness sensor nsor translator ature translator diation translator bucket rain gauge nalyzer ack flow controller ack MFC power supply s the site have the requ			N/A	Computer Modem Printer Zero air p Filter flow Surge pro UPS Lightning Shelter he Shelter air	er rt recorder r pump v pump vtector protection device eater r conditioner	Yes			
	<b>_</b> _	Pres					Curre	ent		
HASP Field Op Calibrat Ozone z/	Log 5 Manual 55 Manual tion Reports /s/p Control Charts ive maintenance schedu									
1 Is t	he station log properly	comp	leted du	ring every	site visit? 🔲 🛛	N/A				
	e the Site Status Report rent?	Forn	ns being	completed	l and 🔽					
	e the chain-of-custody f aple transfer to and fro			y used to d	ocument					
	e ozone z/s/p control cha rent?	arts p	roperly	completed	and 🔽 🕅	N/A				
	any additional explana or man-made, that may					regarding condit	ions listed	above,	or any other fo	eatures,

There is no documentation available at the site since there is no place to store documents. The site does not have a computer or shelter other than the small enclosure. The site operator completes a site checklist which remains in his vehicle. Information from the checklist is later filed at his office. Per instruction from ARS the COC portion of the SSRF is not being used.

#### Site ID FOR605 Technician Martin Valvur Site Visit Date 06/03/2020 Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 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 ✓ 3 schedule? $\checkmark$ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations		N/A	
Automatic Zero/Span Tests		N/A	$\checkmark$
Manual Zero/Span Tests		N/A	$\checkmark$
Automatic Precision Level Tests		N/A	$\checkmark$
Manual Precision Level Test		N/A	$\checkmark$
Analyzer Diagnostics Tests		N/A	$\checkmark$
In-line Filter Replacement (at inlet)		N/A	$\checkmark$
In-line Filter Replacement (at analyze		N/A	$\checkmark$
Sample Line Check for Dirt/Water		N/A	$\checkmark$
Zero Air Desiccant Check		N/A	$\checkmark$
1 Do multi point collibration gages go throu	ugh tha		

- 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?
- Are the automatic and manual z/s/p checks monitored and 3 reported? If yes, how?

$\checkmark$	N/A
✓	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:

### F-02058-1500-S8-rev002

FOR605

Site ID

orm			F-02058-15	500-S9-rev002
Technician	Martin Valvur	Site Visit Date	06/03/2020	

	Site operation procedures			
1	Is the filter pack being changed every	Tuesday as scheduled?		Filter changed afternoons
2	Are the Site Status Report Forms bei correctly?	ng completed and filed	✓	Flow section only
3	Are data downloads and backups bei scheduled?	ng performed as	✓	No longer required
4	Are general observations being made	and recorded? How?		
5	Are site supplies on-hand and replen fashion?	ished in a timely		
6	Are sample flow rates recorded? How	v?		SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?			
8	Are filters protected from contamina and shipping? How?	tion during handling		One set of gloves only
9	Are the site conditions reported regu operations manager or staff?	larly to the field		
QC	Check Performed	Frequency		Compliant
N	Iulti-point MFC Calibrations	Semiannually		
F	'low System Leak Checks	✓ Weekly		
F	ilter Pack Inspection			
F	low Rate Setting Checks	✓ Weekly		
V	visual Check of Flow Rate Rotometer	□ N/A		
Ι	n-line Filter Inspection/Replacement	Semiannually		
S	ample Line Check for Dirt/Water			
D	ide own odditional annlangtion (whata	anank an diatak if maaaa		a) according conditions listed above on our other fortune

Provide any additional 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 sample height is approximately 6 meters and not 10 meters. The observation section of the SSRF is not used.

Field Systems Data Form					<b>F-02058-15</b> 0	0-S10-rev002
Site ID	FOR605	Technician	Martin Valvur	Site Visit Date	06/03/2020	

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR1000	illegible	49922
elevation	Elevation	none	none	none
Flow Rate	Omega	FMA6518ST-RS232	394013-3	none
Infrastructure	Infrastructure	none	none	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	Campbell	10755	124	none

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GRB	e411-Martir	1 Valvur-06/24/2020				
1	6/24/2020	Computer	Hewlett Packard	none	ProBook	5CB22906VO
2	6/24/2020	DAS	Environmental Sys Corp	90635	8816	2507
3	6/24/2020	Elevation	Elevation	None	1	None
4	6/24/2020	Filter pack flow pump	Thomas	none	107CAB18	081700057767
5	6/24/2020	flow rate	Tylan	03387	FC280AV	AW9403026
6	6/24/2020	Infrastructure	Infrastructure	none	none	none
7	6/24/2020	Met tower	Climatronics	01358	18 inch taper	none
8	6/24/2020	MFC power supply	Tylan	03681	RO-32	FP9404004
9	6/24/2020	Ozone	ThermoElectron Inc	none	49iQ-ABBN	1183030014
10	6/24/2020	Ozone	ThermoElectron Inc	90565	49C	49C-59285-322
11	6/24/2020	Ozone Standard	ThermoElectron Inc	none	49C	0330302753
12	6/24/2020	Sample Tower	Aluma Tower	none	В	AT-5381-F9-2
13	6/24/2020	Shelter Temperature	ARS	none	none	80
14	6/24/2020	Siting Criteria	Siting Criteria	None	1	None
15	6/24/2020	Temperature2meter	RM Young	none	41342	018532
16	6/24/2020	Zero air pump	Werther International	90722	TT70/4E	507782

### **DAS Data Form**

DAS Time Max Error: 1.38

Mfg	Serial Nu	mber Site	ſ	<b>Fechnician</b>	Site Visit Date	Parameter	Use Desc.
Environmental	Sys 2507	GRB	411	Martin Valvur	06/24/2020	DAS	Primary
Das Date: Das Time: Das Day:	6 /24/2020 08:43:37 176	Audit Date Audit Time Audit Day	6 /24/2020 08:45:00 176	Mfg Serial Number	HY 12010039329	Parameter Tfer Desc.	DAS Source generator (D
Low Channel:		High Channel		Tfer ID	01322		
Avg Diff: 0.0002	Max Diff: 0.0005	Avg Diff: 0.0002	Max Diff: 0.0005	Slope Cert Date	6/15/201		0.00000
				Mfg Serial Number Tfer ID	Fluke 95740243 01312	Parameter Tfer Desc.	
				Slope	1.0000	Intercept	0.00000
				Cert Date	1/28/202	O CorrCoff	1.00000
Channel	Input D	VM Output	DAS Output	InputUnit	OutputUnit	Difference	
13	0.0000	-0.0007	-0.0009	) V	V	-0.0002	
13	0.1000	0.0992	0.0991		V	-0.0001	
13	0.3000	0.2993	0.2992		V	-0.0001	
13	0.5000	0.4995	0.4995		V	0.0000	
13	0.7000	0.6995	0.6990		V	-0.0005	
13	0.9000	0.8997	0.8998		V	0.0001	
13	1.0000	0.9996	0.9993	3 V	V	-0.0003	

## Flow Data Form

Mfg	Se	rial Num	iber Tag S	Site	Тес	chnician	Site Vis	sit Date	Paran	neter	Owner ID
Tylan	A	W940302	:6	GRB411	Ma	artin Valvur	06/24/2	2020	flow ra	te	03387
Mfg	Tylan					Mfg	BIOS		P	arameter Flo	w Rate
SN/Owner ID	FP940	)4004	03681			Serial Number	122974		Г	fer Desc. BIC	)S 220-H
Parameter:	MFC p	power sup	oply			Tfer ID	01416				
						Slope		1.0000	0 Int	ercept	0.00000
						Cert Date		5/6/202	20 <b>Co</b>	rrCoff	1.00000
<b>DAS 1:</b>			DAS 2:		L	Cal Factor Z	ero		0.3	43	
A Avg % Diff:	A Max	x % Dif	A Avg %l	Diff A Max	% Dif	Cal Factor F	ull Scale		5.9	75	
0.59%		0.60%				<b>Rotometer R</b>	eading:		3	3.4	
Desc.	Tes	st type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S	SE Inp	utUnit	OutputSignall	PctDifference
primary	pump	off	0.000	0.000	-0.30	0.0000	0.05	1	/m	l/m	
primary	leak c	heck	0.000	0.000	-0.29	0.0000	0.06	1	/m	l/m	
primary	test pt	1	3.000	3.000	2.39	0.0000	3.02	1	/m	l/m	0.60%
primary	test pt	2	3.005	3.000	2.39	0.0000	3.02	1	/m	l/m	0.57%
primary	test pt	3	3.000	3.000	2.39	0.0000	3.02	1	/m	l/m	0.60%
Sensor Comp	onent	Leak Tes	t		Conditio	n			Statu	s pass	
Sensor Comp	onent	Tubing C	ondition		Conditio	n Good			Statu	s pass	
Sensor Comp	onent	Filter Pos	ition		Conditio	n Poor			Statu	s pass	
Sensor Comp	onent	Rotomete	er Condition	1	Conditio	Clean and dry			Statu	s pass	
Sensor Comp	onent	Moisture	Present		Conditio	n No moisture p	resent		Statu	s pass	
Sensor Comp	onent	Filter Dist	ance		Conditio	7.0 cm			Statu	<mark>s</mark> pass	
Sensor Comp	onent	Filter Dep	oth		Conditio	<b>n</b> -1.5 cm			Statu	s Fail	
Sensor Component Filter Azimuth			Conditio	ion 270 deg			Statu	<mark>s</mark> pass			
Sensor Comp	onent	System N	1emo		Conditio	n			Statu	s pass	

## **Ozone Data Form**

ThermoElectr					10	chnician	Site Visit Date	Parame	eter	Owner ID
	ron Inc	1183030014	GRB41	1	Ma	artin Valvur	06/24/2020	Ozone		none
Slope: Intercept CorrCoff:	-0	0.97888 Slope 0.67707 Inter 0.99986 Corr	cept	0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID	ThermoElectron 49CPS-70008-3 01110			er ozone c. Ozone primary stan
_		lax % Dif A	AS 2: Avg %Diff A	Max % I		Slope Cert Date	1.0026		•	0.03590
0.09	%	0.0%				Cert Date	1/14/20/		Coll	0.55555
UseDescrip primary primary primary	y y	ConcGroup 1 2 3	Tfer Raw 0.12 17.78 37.71	Tfer ( 0.0 17.6 37.5	8 59	Site 0.10 16.59 35.68	Site Unit ppb ppb ppb	RelPer	Dif -5.16	AbsDif 0.02 -1.1
primary		4	67.71	67.4	19	64.44	ppb		-4.62	
primary		5	112.56	112.		109.90	ppb		-2.1	
Sensor Co	mponer	nt Audit Pressu nt Sample Train	٦	Co	onditio	on 600.0 mmHg on Good		Status Status	[	
Sensor Co	mponer	nt Minimum dis	tance from roa	d met Co	onditio	on True		Status	pass	
Sensor Co	mponer	nt Inlet Filter Co	ondition	Co	onditio	on Clean		Status	pass	
Sensor Co	mponer	nt 26.6 degree	unobstructed r	ule Co	onditio	on True		Status	pass	
Sensor Co	mponer	nt Tree dewline	>10m or below	w inlet Co	onditio	on True		Status	pass	
Sensor Co	mponer	nt Offset		Co	onditio	<b>on</b> 0.000		Status	pass	
Sensor Co	mponer	nt Span		Co	onditio	<b>on</b> 1.015		Status	pass	
Sensor Co	mponer	nt Zero Voltage	;	Co	onditio	on N/A		Status	pass	
Sensor Co	mponer	nt Fullscale Vol	ltage	Co	onditio	on N/A		Status	pass	
Sensor Co	mponer	nt Cell A Freq.		Co	onditio	on 78.6 kHz		Status	pass	
Sensor Co	mponer	nt Cell A Noise		Co	onditio	0.8 ppb		Status	pass	
Sensor Co	mponer	nt Cell A Flow		Co	onditio	on 1.22 lpm		Status	pass	
Sensor Co	mponer	nt Cell A Press	ure	Co	onditio	on 582.9 mmHg		Status	pass	
Sensor Co	mponer	nt Cell A Tmp.		Co	onditio	on 27.3 C		Status	pass	
Sensor Co	mponer	nt Cell B Freq.		Co	onditio	0n 78.8 kHz		Status	pass	
Sensor Co	mponer	nt Cell B Noise		Co	onditio	0.7 ppb		Status	pass	
Sensor Co	mponer	nt Cell B Flow		Co	onditio	on N/A		Status	pass	
Sensor Co	mponer	nt Cell B Press	ure	Co	onditio	on 582.9 mmHg		Status	pass	
Sensor Co	mponer	nt Line Loss		Co	onditio	on Not tested		Status	pass	
Sensor Co	mponer	nt System Mem	0	Co	onditio	on		Status	pass	

# 2 Meter Temperature Data Form

**Calc. Difference** 

Mfg	Serial Number	Tag Site	Т	<b>Technicia</b>	n	Site Vis	it Date	Paramete	er	Owner ID
RM Young	018532	GRB411		Martin Va	llvur	06/24/2	2020	Temperati	ure2meter	none
				Mfg Serial Tfer I	Number	Fluke 3275143 01229	3		meter Tem Desc. RTD	
DAS 1: Abs Avg Err Al		.S 2: s Avg Err Ab	s Max Err	Slope Cert I			1.00020		-	-0.01710
0.13	0.17									
UseDescription	Test type	InputTmpRaw	InputTmpCo	orrected	OutputTm	pSignal	OutputS	ignalEng	OSE Unit	Difference
primary 7	Temp Low Rang	0.29		0.31		0.0000		0.20	С	-0.11
primary 7	Temp Mid Range	22.99		23.00		0.0000		23.17	С	0.17
primary 7	Temp High Rang	49.15		49.15		0.0000		49.25	С	0.1
Sensor Compon	ent Shield		Condi	tion Clea	an			Status Pa	ass	
Sensor Compon	ent Properly Site	d	Condi	tion Prop	perly sited			Status pa	ass	
Sensor Compon	ent Blower		Condi	tion N/A				Status pa	ass	
Sensor Compon	ent System Mem	0	Condi	tion				Status pa	ass	

# Shelter Temperature Data For

Mfg	Serial Nun	nber Tag S	Site	Т	echnician	Site Visit Date	Parameter	Owner ID
ARS	80		GRB411	Ν	lartin Valvur	06/24/2020	Shelter Temperature	none
DAS 1:		<b>DAS 2:</b>			Mfg	Fluke	Parameter She	Iter Temperature
Abs Avg Err Ab	os Max Err 0.87		Err Abs Max	Err	Serial Number	3275143	Tfer Desc. RTE	)
					Tfer ID	01229		
					Slope	1.0002	6 Intercept	-0.01710
					Cert Date	1/29/202	0 CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.17	23.18	0.000	23.6	С	0.42
primary	Temp Mid Range	23.15	23.16	0.000	23.6	С	0.43
primary	Temp Mid Range	22.55	22.56	0.000	23.4	С	0.87
Sensor Cor	nponent System Memo		Condition		Status	pass	

#### **Infrastructure Data For**

Site ID GR	B411	Technician	Martin Valvur		Site Visit Date	06/24/2020	]
Shelter Make	SI	nelter Model		Shelter	r Size		
Ekto	88	310 (s/n 2652-1	)	640 cul	ft		
and the second second second second		en de la company de la comp					

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

# **Field Systems Comments**

1 Parameter: DocumentationCo

The station logbook system (Dataview) and the station maintenance reports are not current.

2 Parameter: ShelterCleanNotes

The shelter is in fair condition, The shelter floor has missing and crumbled tiles.

# Siting Criteria Form

ass
ass
ail
ass

### F-02058-1500-S1-rev002

Site ID GRB411		Technician Martin Valvur			Site Visit Date 06/24/2020			]	
					USCS Mar		Lehman Caves		
Site Sponsor (agency)		NPS			USGS Map		Leninari Caves		
<b>Operating Grou</b>	ıp	NPS			Map Scale				
AQS #		32-033-07	101		Map Date				
Meteorological Type		Climatron	ics						
Air Pollutant Analyzer		Ozone, IN	IPROVE		QAPP Latitude		39.0053	39.0053	
Deposition Meas	surement	dry, wet			QAPP Longitude		-114.2158		
Land Use		woodland - evergreen			QAPP Elevation	Meters	2060		
Terrain		complex (	dessert basin and moun	tain)	QAPP Declination	n			
Conforms to MI	LM	No			QAPP Declination	n Date			
Site Telephone		(775) 234	-7104		Audit Latitude		39.005121		
Site Address 1		Great Bas	sin Nat. Park		Audit Longitude			-114.2	215932
Site Address 2		Hwy 488			Audit Elevation				2058
County		White Pine			Audit Declination	L	12.5		
City, State		Baker, N\	/		I	Present			
Zip Code		89311			Fire Extinguisher				
Time Zone		Pacific			First Aid Kit				
Primary Operat	tor				Safety Glasses				
Primary Op. Ph	hone #				Safety Hard Hat				
Primary Op. E-	mail				Climbing Belt				
Backup Operato	or				Security Fence				
Backup Op. Ph	one #				Secure Shelter				
Backup Op. E-r	mail				Stable Entry Step	S ▼			
Shelter Working	g Room 🗹	Make	Ekto	M	odel 8810 (s/n 2652	2-1)	Shelter Size	640 cuft	
Shelter Clean	$\checkmark$	Notes	The shelter is in fair con	dition,	The shelter floor has	missing a	nd crumbled tiles	i.	
Site OK		Notes							
<b>Driving Directio</b>	Driving Directions       From Las Vegas travel north on Interstate 15 to exit 109 in Beaver, Utah. Travel west on 21 to Garrison, Nevada and turn left on route 487 and continue to Baker. Turn left on 488 in Baker and follow the signs to Great Basin National Park. The site is on the left of the road to the residential and office area.								

Fie	eld Sy	stems Data Fo	orm		F-02058-1500-S3-rev00					rev002
Site	e ID	GRB411	Technician	Martin Valvur		Site Visit Date	06/24/2020			
1		d speed and direction fluenced by obstructio		as to avoid		N/A				
2	(i.e. win horizon	d sensors mounted so d sensors should be m ally extended boom > to the prevailing wind	ounted atop the 2x the max diar	tower or on a		N/A				
3	Are the	tower and sensors plu	mb?		✓	N/A				
4		temperature shields p diated heat sources su			✓					
5	conditio surface	perature and RH sens ns? (i.e. ground below and not steeply sloped g water should be avoi	sensors should . Ridges, hollow	be natural						
6	Is the so	lar radiation sensor p	lumb?		✓	N/A				
7	Is it site	d to avoid shading, or	any artificial o	reflected light?		N/A				
8	Is the ra	in gauge plumb?			✓	N/A				
9	Is it site towers,	d to avoid sheltering e etc?	ffects from buil	dings, trees,		N/A				
10	Is the su facing n	rface wetness sensor s orth?	sited with the gr	id surface		N/A				
11	Is it inc	lined approximately 3	0 degrees?			N/A				

### F-02058-1500-S4-rev002

Site	e ID	GRB411	Technician	Martin Valvur		Site Visit Date 06/24/2020
<ol> <li>Do all the meterological sensors appear to be intact, in good condition, and well maintained?</li> <li>Are all the meteorological sensors operational online, and reporting data?</li> </ol>						Temperature only       Temperature only
3					✓	
4	Are the aspirated motors working?				✓	
5	Is the sol scratches	ar radiation sensor's s?	lens clean and f	ree of	✓	N/A
6	Is the su	rface wetness sensor g	grid clean and u	ndamaged?	✓	N/A
7	condition	ensor signal and pow n, and well maintained	1?	-	<b>&gt;</b>	
8		ensor signal and pow elements and well ma		tions protected	V	

Fi	ield Systems Data Form				<b>F-02058-1</b>	500-S5-rev002
Site	e ID	GRB411	Technician Martin Valvu	ur	Site Visit Date 06/24/2020	
	<u>Siting C</u>	riteria: Are the pollut	ant analyzers and deposition	on equipn	nent sited in accordance with 40 CFR	58, Appendix E
1		ample inlets have at le cted airflow?	east a 270 degree arc of			
2	Are the	sample inlets 3 - 15 m	eters above the ground?	$\checkmark$		
3		sample inlets > 1 meten neters from trees?	r from any major obstruct	ion, 🔽		
	<b>Pollutan</b>	t analyzers and depos	ition equipment operations	s and mai	ntenance	
1		nalyzers and equipme n and well maintained	ent appear to be in good ?			
2	Are the reportin		rs operational, on-line, and			
3	Describe	e ozone sample tube.			1/4 teflon by 12 meters	
4	Describe	e dry dep sample tube			3/8 teflon by 12 meters	
5		ne filters used in the olocation)	zone sample line? (if yes		At inlet only	
6	Are sam obstruct		kinks, moisture, and	$\checkmark$		
7	Is the ze	ro air supply desiccan	t unsaturated?	$\checkmark$		
8	Are then	e moisture traps in th	e sample lines?		Flow line only	
9	Is there clean?	a rotometer in the dry	deposition filter line, and	is it 🗹	Clean and dry	

Fi	Field Systems Data Form						<b>F-020</b>	58-15	00-S6-rev002	
Site	e ID	GRB411	Technician	Martin Valvur		Site Visit	Date	06/24/2020		
	DAS, se	nsor translators, and	peripheral equi	pment operation	<u>ns ai</u>	<u>nd maintenan</u>	<u>ce</u>			
1		DAS instruments appe intained?	ar to be in good	l condition and						
2		the components of the , backup, etc)	DAS operation	al? (printers,	✓					
3		analyzer and sensor sig g protection circuitry		through		Met sensors o	only			
4		signal connections pro intained?	otected from the	e weather and	✓					
5	Are the	signal leads connected	l to the correct	DAS channel?	✓					
6	Are the ground	DAS, sensor translato ed?	ors, and shelter	properly	✓					
7	Does the	e instrument shelter h	ave a stable pov	ver source?	✓					
8	Is the in	strument shelter temp	perature control	lled?						
9	Is the m	et tower stable and gr	ounded?			Stable 🗸		Gı	ounded	
10	Is the sa	ample tower stable and	l grounded?							
11	Tower o	comments?							•	

Field S	ystems Data l	For	m				<b>F-02</b>	2058-	1500-S	7-rev0(	)2
Site ID	GRB411		Tech	nician	Martin Valvur	Site Visit Date	06/24/2020	)			
Docume	<u>ntation</u>										
Does the	site have the require	d inst	trume	ent and e	equipment manuals?						
Temperatu Relative hu Solar radia Surface we Wind senso Temperatu Humidity s Solar radia Tipping bu Ozone anal Filter pack	d sensor etion sensor are sensor amidity sensor ation sensor tness sensor or translator are translator ensor translator ation translator ation translator acket rain gauge byzer flow controller			N/A Y X Y Y Y Y Y U U	Data logger Data logger Strip chart Computer Modem Printer Zero air pu Filter flow p Surge prote UPS	recorder mp pump ector protection device ter	Yes ✓ □ ✓ □ □ □ □ □ □ □ □ □ □ □ □ □	No	N/A  V V V V V V V V V V V V V V V V V V		
Does th	<u>ne site have the requir</u>	ed ar	nd mo	<u>st recen</u>	nt QC documents and 1	report forms?					
Preventive	g Ganual Manual 1 Reports 2 Control Charts maintenance schedulo			Dataviev Oct 2015	5			nt			
1 Is the	station log properly c	ompl	eted d	luring e	every site visit? 🔽 Da	ataview					
2 Are th curren	e Site Status Report I nt?	Form	s bein	ig comp	oleted and						
	e chain-of-custody for e transfer to and from			rly used	l to document 🔽						
4 Are oz	zone z/s/p control chan nt?	rts pr	operl	y compl	leted and 🗌 Co	ontrol charts not u	ised				
	y additional explanati man-made, that may a				r sketch if necessary) r ing parameters:	egarding condit	ions listed	above, o	or any othe	r features,	

The station logbook system (Dataview) and the station maintenance reports are not current.

#### GRB411 Technician Martin Valvur Site Visit Date 06/24/2020 Site ID Site operation procedures Has the site operator attended a formal CASTNET training 1 course? If yes, when and who instructed? 2 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 ✓ 3 schedule? $\checkmark$ Are the standard CASTNET operational procedures being 4 flollowed by the site operator? Is the site operator(s) knowledgeable of, and able to perform 5 the required site activities? (including documentation)

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

#### **QC Check Performed**

#### Frequency

Frequency

Multipoint Calibrations	$\checkmark$	Semiannually	
Visual Inspections	$\checkmark$	Weekly	
Translator Zero/Span Tests (climatronics)	$\checkmark$	N/A	
Manual Rain Gauge Test	$\checkmark$	N/A	
Confirm Reasonableness of Current Values	$\checkmark$	Weekly	
Test Surface Wetness Response	$\checkmark$	N/A	

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

QC Check Performed	1
--------------------	---

**Multi-point Calibrations Automatic Zero/Span Tests** Manual Zero/Span Tests Automatic Precision Level Tests **Manual Precision Level Test Analyzer Diagnostics Tests In-line Filter Replacement (at inlet) In-line Filter Replacement (at analyze** Sample Line Check for Dirt/Water **Zero Air Desiccant Check** 

Semiannually	
Daily	
Monthly	
Daily	
Alarm values only	
Every 2 weeks	
N/A	
Weekly	
As needed	

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

Unknown
Dataview

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

١

#### **Compliant**

**Compliant** 

F-02058-1500-S8-rev002

F-02058-1500-S9-rev	002
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Site	ID	GRB411	Technician	Martin Valvur		Site Visit Date	06/24/2020			
	<u>Site op</u>	eration procedures								
1	Is the f	ilter pack being changed	l every Tuesda	y as scheduled?		Filter changed morin	ings			
	Are the correct	e Site Status Report Forr ly?	ms being comp	leted and filed	✓	Flow & observation sections				
	Are da schedu	ta downloads and backu led?	ps being perfo	rmed as		No longer required				
4	Are ge	neral observations being	made and rec	orded? How?	✓	SSRF				
	Are site fashion	e supplies on-hand and r ?	eplenished in a	a timely	✓					
6	Are sai	nple flow rates recorded	l? How?		✓	SSRF				
	Are sau fashion	nples sent to the lab on a ?	a regular sched	lule in a timely						
		ers protected from conta pping? How?	amination duri	ing handling	✓	Clean gloves on and	l off			
		e site conditions reported ons manager or staff?	l regularly to t	he field						
QC	Check I	Performed	Freq	uency			Compliant			
Μ	lulti-po	int MFC Calibrations	🗹 Semi	annually						
F	low Sys	tem Leak Checks	✓ Weel	kly						
Fi	Filter Pack Inspection									
F	Flow Rate Setting Checks Weekly									
V	Visual Check of Flow Rate Rotometer Veekly									
In	<mark>1-line</mark> Fi	lter Inspection/Replacer	nent 🗹 As ne	eded						
Sa	ample L	ine Check for Dirt/Wate	er 🗌							

GRB411

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

Site ID

Techn

Technician Martin Valvur

Site Visit Date 06/24/2020

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	5CB22906VO	none
DAS	Environmental Sys Corp	8816	2507	90635
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	081700057767	none
flow rate	Tylan	FC280AV	AW9403026	03387
Infrastructure	Infrastructure	none	none	none
Met tower	Climatronics	18 inch taper	none	01358
MFC power supply	Tylan	RO-32	FP9404004	03681
Ozone	ThermoElectron Inc	49iQ-ABBN	1183030014	none
Ozone Standard	ThermoElectron Inc	49C	0330302753	none
Sample Tower	Aluma Tower	В	AT-5381-F9-2	none
Shelter Temperature	ARS	none	80	none
Siting Criteria	Siting Criteria	][1	None	None
Temperature2meter	RM Young	41342	018532	none
Zero air pump	Werther International	TT70/4E	507782	90722

### **APPENDIX B**

**CASTNET Site Spot Report Forms** 

Data Compiled:

8/15/2020 13:27:38

### SiteVisitDate Site Technician

05/30/2020 COW137 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	15	0.19	с	Р
2	Temperature max error	Р	4	0.5	15	0.32	с	Р
3	Ozone Slope	Р	0	1.1	4	0.98820	unitless	Р
4	Ozone Slope	Р	0	1.1	4	0.98820	unitless	Р
5	Ozone Intercept	Р	0	5	4	-1.43148	ppb	Р
6	Ozone Intercept	Р	0	5	4	-1.43148	ppb	Р
7	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
8	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
9	Ozone % difference avg	Р	7	10	4	5.1	%	Р
10	Ozone Absolute Difference g1	Р	7	3	1	-1.56	ppb	Р
11	Ozone Absolute Difference g2	Р	7	1.5	1	-1.46	ppb	Р
12	Flow Rate average % difference	Р	10	5	4	2.6	%	Р
13	Flow Rate max % difference	Р	10	5	4	2.6	%	Р
14	DAS Voltage average error	Р	7	0.003	77	0.0001	V	Р
15	Shelter Temperature average error	Р	5	2	18	0.66	с	Р
16	Shelter Temperature max error	Р	5	2	18	1.31	с	Р

05/30/2020 COW137

Technician

### Sandy Grenville

### **Field Performance Comments**

1Parameter:Flow RateSensorComponent:Filter DepthCommentCode: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: ShelterCleanNotes

There are some wet spots from an apparent leak near the north and south walls.

Data Compiled:

8/11/2020 11:25:58

### SiteVisitDate Site Technician

05/22/2020 IRL141 Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	12	0.29	c	Р
2	Temperature max error	Р	4	0.5	12	0.42	с	Р
3	Ozone Slope	Р	0	1.1	4	0.99475	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.20607	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99996	unitless	Р
6	Ozone % difference avg	Р	7	10	4	0.9	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	0.53	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-0.28	ppb	Р
9	Flow Rate average % difference	Р	10	5	6	1.96	%	Р
10	Flow Rate max % difference	Р	10	5	6	1.96	%	Р
11	Shelter Temperature average error	Р	5	2	12	0.16	c	Р
12	Shelter Temperature max error	Р	5	2	12	0.30	с	Р

### **Field Systems Comments**

#### 1 Parameter: SiteOpsProcedures

Manual z/s/p performed following ozone inlet filter changes. Leak checks are no longer performed.

#### 2 Parameter: ShelterCleanNotes

The shelter is clean and well organized. The shelter floor and bottom of the walls are severely rotting with extensive mold growth. It has deteriorated since the previous audit.

#### 3 Parameter: MetOpMaintCom

Only the temperature sensor was audited during this visit. The other meteorological sensors were not included. The temperature sensor signal cable shows signs of wear.

Data Compiled:

8/15/2020 13:56:51

### SiteVisitDate Site Technician

05/31/2020 SND152 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	3	0.40	с	Р
2	Temperature max error	Р	4	0.5	3	0.53	c	Fail
3	Ozone Slope	Р	0	1.1	4	0.99969	unitless	Р
4	Ozone Intercept	Р	0	5	4	0.42217	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
6	Ozone % difference avg	Р	7	10	4	1.2	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	0.34	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	0.29	ppb	Р
9	Flow Rate average % difference	Р	10	5	4	1.32	%	Р
10	Flow Rate max % difference	Р	10	5	4	1.32	%	Р
11	DAS Voltage average error	Р	7	0.003	84	0.0000	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.23	с	Р
13	Shelter Temperature max error	Р	5	2	18	0.30	с	Р

05/31/2020 SND152

Technician

Sandy Grenville

## **Field Performance Comments**

1Parameter:Flow RateSensorComponent:Moisture PresentCommentCode:72

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

# **Field Systems Comments**

1 Parameter: SiteOpsProcComm

Unable to meet with operator due to COVID policy.

2 Parameter: DasComments

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

#### 3 Parameter: SiteOpsProcedures

Ozone sample line leak checks are no longer performed. A manual zero/span test is performed every two weeks following the inlet filter change.

#### 4 Parameter: SitingCriteriaCom

The site is located on an active research farm with cattle and poultry. Cattle are fed within 100 meters of the site. A new building has been constructed 32 meters south of the sample tower. A Climate Reference Network site is located on the farm on the south side of Hwy 68 which is a better location for the CASTNET site.

#### 5 Parameter: ShelterCleanNotes

The shelter is kept clean, neat, and very well organized. The shelter floor continues to deteriorated with areas of extreme rot just inside the door and along the north wall.

#### 6 Parameter: MetSensorComme

The temperature sensor is mounted to the sample tower and is oriented to the west.

**Data Compiled:** 8/11/2020 17:12:49

# SiteVisitDateSiteTechnician06/02/2020BAS601Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	1.00369	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.20488	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99998	unitless	Р
4	Ozone % difference avg	Р	7	10	4	0.7	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	0.10	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.16	ppb	Р

**Data Compiled:** 8/15/2020 16:25:13

SiteVisitDate	Site	Technician
06/03/2020	FOR605	Martin Valvur
Records with	valid pass/fail criteria	

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.10	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.18	с	Р
3	Flow Rate average % difference	Р	10	5	3	1.47	%	Р
4	Flow Rate max % difference	Р	10	5	3	1.69	%	Р

### **Field Systems Comments**

#### 1 Parameter: SiteOpsProcComm

The dry deposition sample height is approximately 6 meters and not 10 meters. The observation section of the SSRF is not used.

#### 2 Parameter: DocumentationCo

There is no documentation available at the site since there is no place to store documents. The site does not have a computer or shelter other than the small enclosure. The site operator completes a site checklist which remains in his vehicle. Information from the checklist is later filed at his office. Per instruction from ARS the COC portion of the SSRF is not being used.

#### 3 Parameter: SitingCriteriaCom

The site is located in a wellfield with oil and gas operations nearby.

4 Parameter: ShelterCleanNotes

This is a small footprint site with instruments mounted in enclosure on tripod tower.

#### 5 Parameter: PollAnalyzerCom

The enclosure protecting the dry deposition filter pack is much smaller in diameter than the normal filter pack enclosure. The geometry of the enclosure may effect particulate collection making data not directly comparable to other CASTNET sites.

#### 6 Parameter: MetOpMaintCom

The temperature sensor is now separate from the humidity sensor. The relative humidity measurement is 8 meters above the ground, and the temperature measurement is 2.2 meters above ground.

Data Compiled:

8/15/2020 14:21:24

### SiteVisitDate Site Technician

06/01/2020 GAS153 Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	Р	4	0.5	21	0.25	с	Р
2	Temperature max error	Р	4	0.5	21	0.40	с	Р
3	Ozone Slope	Р	0	1.1	4	0.96464	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.73163	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99997	unitless	Р
6	Ozone % difference avg	Р	7	10	4	6.2	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	-0.3	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-1.34	ppb	Р
9	Flow Rate average % difference	Р	10	5	4	0.88	%	Р
10	Flow Rate max % difference	Р	10	5	4	1.32	%	Р
11	DAS Voltage average error	Р	7	0.003	63	0.0000	V	Р
12	Shelter Temperature average error	Р	5	2	18	0.67	с	Р
13	Shelter Temperature max error	Р	5	2	18	0.85	c	Р

Technician

06/01/2020 GAS153

Sandy Grenville

### **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

Unable to meet with operator due to COVID policy.

2 Parameter: SiteOpsProcedures

It was reported that the ozone inlet filter is replaced every two weeks, and a manual zero test is performed every week.

**Data Compiled:** 8/15/2020 16:46:08

SiteVisitDate Site Technician

06/24/2020 GRB411 Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	Р	5	0.5	3	0.13	с	Р
2	Temperature2meter max error	Р	5	0.5	3	0.17	с	Р
3	Ozone Slope	Р	0	1.1	4	0.97888	unitless	Р
4	Ozone Intercept	Р	0	5	4	-0.67707	ppb	Р
5	Ozone correlation	Р	0	0.995	4	0.99986	unitless	Р
6	Ozone % difference avg	Р	7	10	4	4.5	%	Р
7	Ozone Absolute Difference g1	Р	7	3	1	0.02	ppb	Р
8	Ozone Absolute Difference g2	Р	7	1.5	1	-1.1	ppb	Р
9	Flow Rate average % difference	Р	10	5	12	0.59	%	Р
10	Flow Rate max % difference	Р	10	5	12	0.60	%	Р
11	DAS Voltage average error	Р	13	0.003	84	0.0002	V	Р
12	Shelter Temperature average error	Р	5	2	21	0.57	с	Р
13	Shelter Temperature max error	Р	5	2	21	0.87	c	Р

## **Field Systems Comments**

#### 1 Parameter: DocumentationCo

The station logbook system (Dataview) and the station maintenance reports are not current.

#### 2 Parameter: ShelterCleanNotes

The shelter is in fair condition, The shelter floor has missing and crumbled tiles.

**Data Compiled:** 8/11/2020 17:33:25

# SiteVisitDateSiteTechnician06/17/2020LRL117Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98615	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.35395	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	2.5	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.27	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.56	ppb	Р

**Data Compiled:** 8/11/2020 17:20:55

# SiteVisitDateSiteTechnician06/03/2020NEC602Martin Valvur

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.98551	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.60777	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99989	unitless	Р
4	Ozone % difference avg	Р	7	10	4	4.3	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	0.30	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-1.39	ppb	Р

**Data Compiled:** 8/11/2020 17:39:22

# SiteVisitDateSiteTechnician06/23/2020PRK134Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96157	unitless	Р
2	Ozone Intercept	Р	0	5	4	-1.39677	ppb	Р
3	Ozone correlation	Р	0	0.995	4	0.99999	unitless	Р
4	Ozone % difference avg	Р	7	10	4	8.4	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-1.26	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-2.00	ppb	Fail

**Data Compiled:** 8/11/2020 17:27:20

# SiteVisitDateSiteTechnician06/16/2020SHN418Korey Devins

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	Р	0	1.1	4	0.96769	unitless	Р
2	Ozone Intercept	Р	0	5	4	-0.13372	ppb	Р
3	Ozone correlation	Р	0	0.995	4	1.00000	unitless	Р
4	Ozone % difference avg	Р	7	10	4	3.7	%	Р
5	Ozone Absolute Difference g1	Р	7	3	1	-0.04	ppb	Р
6	Ozone Absolute Difference g2	Р	7	1.5	1	-0.66	ppb	Р

### **APPENDIX C**

**CASTNET Ozone Performance Evaluation Forms** 

# Site Inventory by Site Visit

Site V	isit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number		
BAS601-Martin Valvur-06/02/2020								
1	6/2/2020	DAS	Campbell	none	CR1000	41006		
2	6/2/2020	Ozone	ThermoElectron Inc	L0534684	49i A1NAA	1214552973		
3	6/2/2020	Ozone Standard	ThermoElectron Inc	none	49i E3CAA	1214552971		
4	6/2/2020	Zero air pump	Thomas	none	107CAB18	100800033636		

### **Ozone Data Form**

Mfg		Serial Numbe	r Tag Site		Tech	nician	Site Visit Date	Parame	eter	Owner ID
ThermoElec	tron Inc	1214552973	BAS60	1	Marti	n Valvur	06/02/2020	Ozone		L0534684
Slope: Intercept CorrCoff:	-(	1.00369         Slop           0.20488         Inter           0.99998         Corr	rcept	0.00000 0.00000 0.00000	Se	lfg erial Number fer ID	ThermoElectron 49CPS-70008-3 01110			ozone
_		fax % Dif A	AS 2: Avg %Diff A	Max % Dif	SI	ope ert Date	1.0026		•	0.03590
0.0	0%	0.0%								
UseDescri primate primate	ry	ConcGroup 1 2	Tfer Raw 0.11 15.07	Tfer Co 0.07 14.99		Site 0.17 14.83	Site Unit ppb ppb	RelPer	Dif	AbsDif 0.1 -0.16
prima prima	ry ry	3 4	35.91 65.11	35.78 64.90		35.55 64.51	ppb ppb		-0.64 -0.6	
prima		5	116.23	115.89		116.40	ppb		0.44	
	_	nt Audit Pressu				663.5 mmHg		Status	[	
	_	nt Sample Trai			dition			Status	L	
Sensor C	ompone	nt Minimum dis	stance from road	d met Con	dition	True		Status	pass	
Sensor C	ompone	nt Inlet Filter C	ondition	Con	dition	Moderately clea	an	Status	pass	
Sensor C	ompone	nt 26.6 degree	unobstructed ru	ule Con	dition	True		Status	pass	
Sensor C	ompone	nt Tree dewline	e >10m or belov	v inlet Con	dition	True		Status	pass	
Sensor C	ompone	nt Offset		Con	dition	0.1		Status	pass	
Sensor C	ompone	<mark>nt</mark> Span		Con	dition	1.009		Status	pass	
Sensor C	ompone	nt Zero Voltage	e	Con	dition	N/A		Status	pass	
Sensor C	ompone	nt Fullscale Vo	ltage	Con	dition	N/A		Status	pass	
Sensor C	ompone	nt Cell A Freq.		Con	dition	106.2 kHz		Status	pass	
Sensor C	ompone	nt Cell A Noise	9	Con	dition	0.8 ppb		Status	pass	
Sensor C	ompone	nt Cell A Flow		Con	dition	0.66 lpm		Status	pass	
Sensor C	ompone	nt Cell A Press	ure	Con	dition	649.8 mmHg		Status	pass	
Sensor C	ompone	nt Cell A Tmp.		Con	dition	31.0 C		Status	pass	
Sensor C	ompone	nt Cell B Freq.		Con	dition	71.6 kHz		Status	pass	
Sensor C	ompone	nt Cell B Noise		Con	dition	1.0 ppb		Status	pass	
Sensor C	ompone	nt Cell B Flow		Con	dition	0.69 lpm		Status	pass	
Sensor C	ompone	nt Cell B Press	ure	Con	dition	649.2 mmHg		Status	pass	
Sensor C	ompone	nt Line Loss		Con	dition	Not tested		Status	pass	
Sensor C	ompone	nt System Men	no	Con	dition			Status	pass	

# Site Inventory by Site Visit

Site V	isit Date/	Parameter	Mfg	Owner ID	Model Number	Serial Number			
NEC602-Martin Valvur-06/03/2020									
1	6/3/2020	DAS	Campbell	none	CR1000	41007			
2	6/3/2020	Ozone	ThermoElectron Inc	none	49i A1NAA	1214552974			
3	6/3/2020	Ozone Standard	ThermoElectron Inc	L0534683	49i E3CAA	1214552972			
4	6/3/2020	Zero air pump	Thomas	none	107CAB18	051400047325			

### **Ozone Data Form**

Mfg		Serial Numbe	r Tag Site		Тес	chnician	Site Visit Date	Parame	eter	Owner ID
ThermoElec	tron Inc	1214552974	NEC60	)2	Ma	artin Valvur	06/03/2020	Ozone		none
Slope: [ Intercept [ CorrCoff: [	-(		e: :cept :Coff:	0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID	ThermoElectron 49CPS-70008-3 01110			er ozone
DAS 1:			AS 2:			Slope	1.002	60 Inter	rcept	0.03590
J		Iax % Dif A	Avg %Diff	A Max % D	Dif	Cert Date	1/14/20	20 <b>Cor</b> ı	Coff	0.99999
	0%	0.0%								
UseDescri	•	ConcGroup	Tfer Raw	Tfer C		Site	Site Unit	RelPer	Dif	AbsDif
primar primar	•	2	0.13	0.0		0.39	ppb ppb			0.3
primar	-	3	37.45	37.3		35.84	ppb		-4.02	-1.59
primar	•	4	64.86	64.6		62.59	ppb		-3.24	
primar	•	5	115.75	115.4		113.60	ppb		-1.58	
Sensor Co	ompone	nt Audit Pressu	ıre	Co	onditio	<b>n</b> 640.0 mmHg		Status	pass	
Sensor Co	ompone	nt Sample Trai	n	Co	onditio	n Good		Status	pass	
Sensor Co	ompone	nt Minimum dis	stance from roa	d met Co	onditio	m True		Status	pass	
Sensor Co	ompone	nt Inlet Filter C	ondition			n Clean		Status	pass	
	_	nt 26.6 degree				n True		Status	pass	
Sensor Co	ompone	nt Tree dewline	e >10m or belo	w inlet Co	onditio	m True		Status	pass	
Sensor Co	ompone	nt Offset		Co	onditio	<b>n</b> 0.1		Status	pass	
Sensor Co	ompone	nt Span		Co	onditio	<b>n</b> 1.005		Status	pass	
Sensor Co	ompone	nt Zero Voltage	9	Co	onditio	n N/A		Status	pass	
Sensor Co	ompone	nt Fullscale Vo	ltage	Co	onditio	n N/A		Status	pass	
Sensor Co	ompone	nt Cell A Freq.		Co	onditio	96.2 kHz		Status	pass	
Sensor Co	ompone	nt Cell A Noise	•	Co	onditio	<b>n</b> 0.9 ppb		Status	pass	
Sensor Co	ompone	nt Cell A Flow		Co	onditio	on 0.66 lpm		Status	pass	
Sensor Co	ompone	nt Cell A Press	ure	Co	onditio	on 627.4 mmHg		Status	pass	
Sensor Co	ompone	nt Cell A Tmp.		Co	onditio	<b>30.5 C</b>		Status	pass	
Sensor Co	ompone	nt Cell B Freq.		Co	onditio	<b>n</b> 84.5 kHz		Status	pass	
Sensor Co	ompone	nt Cell B Noise		Co	onditio	<b>n</b> 1.0 ppb		Status	pass	
Sensor Co	ompone	nt Cell B Flow				0.68 lpm		Status	pass	
Sensor Co	ompone	nt Cell B Press	ure	Co	onditio	<b>n</b> 627.1 mmHg		Status	pass	
Sensor Co	ompone	nt Line Loss		Co	onditio	Not tested		Status	pass	
Sensor Co	ompone	nt System Men	no	Co	onditio	n		Status	pass	

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number	
SHN418-Korey Devins-06/16/2020							
1	6/16/2020	DAS	Environmental Sys Corp	90658	8816	2643	
2	6/16/2020	Ozone	ThermoElectron Inc	none	49i A3NAA	0903334535	
3	6/16/2020	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745083	
4	6/16/2020	Zero air pump	Werther International	none	C 70/4	000855578	

### **Ozone Data Form**

Mfg		Serial Numbe	r Tag Site		Те	chnician	Site Visit Date	Parame	eter	Owner ID
ThermoElec	tron Inc	0903334535	SHN41	8	Kc	orey Devins	06/16/2020	Ozone		none
Slope: Intercept CorrCoff:	-(	0.96769 Slop 0.13372 Inter 1.00000 Corr		0.00000 0.00000 0.00000		Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114			er ozone c. Ozone primary stan
DAS 1: A Avg % D	oiff: A N	DA Iax % Dif A	AS 2: Avg %Diff A	A Max % D	if	Slope	0.9995		•	0.29010
0.0	0%	0.0%				Cert Date	1/14/202	20 Corr	Coff	0.99999
UseDescr primat primat	ry ry	ConcGroup 1 2 3	Tfer Raw 0.51 15.78 35.13	Tfer C 0.22 15.4 34.8	2 9	Site 0.18 14.83 33.52	Site Unit ppb ppb ppb	RelPer	Dif -3.89	AbsDif -0.04 -0.66
prima		4	66.55	66.2		63.94	ppb		-3.61	
prima		5	111.83	111.5		107.92	ppb		-3.34	
	_	nt Audit Pressu nt Sample Trai				on 677.5 mmHg on Good		Status Status	[	
Sensor C	ompone	nt Minimum dis	stance from roa	d met Co	nditio	on True		Status	pass	
Sensor C	ompone	nt Inlet Filter C	ondition	Co	nditi	on Clean		Status	pass	
Sensor C	ompone	nt 26.6 degree	unobstructed r	ule Co	nditio	on True		Status	pass	
Sensor C	ompone	nt Tree dewline	e >10m or belo	w inlet Co	nditi	on True		Status	pass	
Sensor C	ompone	nt Offset		Co	nditio	on -0.2		Status	pass	
Sensor C	ompone	nt Span		Co	nditio	on 0.981		Status	pass	
Sensor C	ompone	nt Zero Voltage	9	Co	nditio	on N/A		Status	pass	
Sensor C	ompone	nt Fullscale Vo	ltage	Co	nditio	on N/A		Status	pass	
Sensor C	ompone	nt Cell A Freq.		Co	nditio	0 <b>n</b> 73.8 kHz		Status	pass	
Sensor C	ompone	nt Cell A Noise	•	Co	nditio	on 1.6 ppb		Status	pass	
Sensor C	ompone	nt Cell A Flow		Co	nditio	0.72 lpm		Status	pass	
Sensor C	ompone	nt Cell A Press	ure	Co	nditio	on 667.8 mmHg		Status	pass	
Sensor C	ompone	nt Cell A Tmp.		Co	nditio	on 34.2 C		Status	pass	
Sensor C	ompone	nt Cell B Freq.		Co	nditio	on 111.4 kHz		Status	pass	
Sensor C	ompone	nt Cell B Noise	!	Co	nditio	on 1.8 ppb		Status	pass	
Sensor C	ompone	nt Cell B Flow		Co	nditi	0.71 lpm		Status	pass	
Sensor C	ompone	nt Cell B Press	ure	Co	nditi	on 668.1 mmHg		Status	pass	
Sensor C	ompone	nt Line Loss		Co	nditi	on Not tested		Status	pass	
Sensor C	ompone	nt System Men	no	Co	nditi	on		Status	pass	

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
LRL117-Korey Devins-06/17/2020									
1	6/17/2020	DAS	Campbell	000344	CR300	2123			
2	6/17/2020	Ozone	ThermoElectron Inc	000701	49i A1NAA	1030244808			
3	6/17/2020	Ozone Standard	ThermoElectron Inc	000444	49i A3NAA	CM08200020			
4	6/17/2020	Zero air pump	Werther International	06904	C 70/4	000821901			

### **Ozone Data Form**

Mfg	Serial Numbe	er Tag Site		Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron I	nc 1030244808	LRL117		Korey Devins	06/17/2020	Ozone	000701
Slope: Intercept CorrCoff:		rcept (	0.00000 0.00000 0.00000	Mfg Serial Number Tfer ID	ThermoElectron 1180030022 01114		sc. Ozone primary stan
DAS 1: A Avg % Diff: A 0.0%		AS 2: Avg %Diff A	Max % Dif	Slope Cert Date	0.999		0.29010
UseDescription		Tfer Raw 0.45	Tfer Cor 0.15	r Site -0.12	Site Unit	RelPerDif	AbsDif -0.27
primary primary primary	2 3 4	15.38 34.17 67.48	15.09 33.89 67.22	14.53 33.05 65.74	ppb ppb ppb	-2.51	
primary Sensor Compo	5 nent Audit Press	111.31 ure	111.07 Cond	109.30 lition 714.4 mmHg	ppb	-1.61 Status pass	
	nent Sample Tra			lition Good		Status pass	
Sensor Compo	ment Minimum di	stance from road	I met Cond	lition True		Status pass	
-	nent Inlet Filter C			lition Clean		Status pass	
	nent 26.6 degree			lition True		Status pass	
	nent Tree dewlin	e >10m or below	,	lition True		Status pass	
Sensor Compo				lition -0.1		Status pass	
Sensor Compo	nent Span			lition 1.011		Status pass	
Sensor Compo	nent Zero Voltag	е	Cond	lition N/A		Status pass	
Sensor Compo	nent Fullscale Vo	oltage	Cond	lition N/A		Status pass	
Sensor Compo	nent Cell A Freq		Cond	lition 131.0 kHz		Status pass	
Sensor Compo	nent Cell A Noise	e	Cond	lition 0.9 ppb		Status pass	
Sensor Compo	nent Cell A Flow		Cond	lition 0.64 lpm		Status pass	
Sensor Compo	nent Cell A Pres	sure	Cond	lition 698.5 mmHg		Status pass	
Sensor Compo	nent Cell A Tmp.		Cond	lition 34.4 C		Status pass	
Sensor Compo	nent Cell B Freq		Cond	lition 90.6 kHz		Status pass	
Sensor Compo	nent Cell B Noise	e	Cond	lition 0.9 ppb		Status pass	
Sensor Compo	nent Cell B Flow		Cond	lition 0.68 lpm		Status pass	
Sensor Compo	nent Cell B Pres	sure	Cond	lition 699.4 mmHg		Status pass	
Sensor Compo	nent Line Loss		Cond	lition Not tested		Status pass	
Sensor Compo	nent System Me	mo	Cond	lition		Status pass	

# Site Inventory by Site Visit

Site	Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number			
PRK134-Korey Devins-06/23/2020									
1	6/23/2020	DAS	Campbell	000411	CR3000	2509			
2	6/23/2020	Ozone	ThermoElectron Inc	000693	49i A1NAA	1030244806			
3	6/23/2020	Ozone Standard	ThermoElectron Inc	000440	49i A3NAA	CM08200016			
4	6/23/2020	Zero air pump	Werther International	06905	C 70/4	000821907			

### **Ozone Data Form**

Mfg		Serial Numbe	r Tag Site		Tecl	hnician	Site Visit Date	Parame	eter	Owner ID
ThermoElec	tron Inc	1030244806	PRK134	ŀ	Kor	ey Devins	06/23/2020	Ozone		000693
Slope: Intercept	-'		cept (	).00000 ).00000 ).00000		Mfg Serial Number	ThermoElectron			er ozone
CorrCoff:		0.999999 Cori	Coff:	).00000	1	<b>Ffer ID</b>	01114			
DAS 1:	1.00. A TA		AS 2: Avg %Diff A	Mar. 0/ D:4		Slope	0.9995	50 Inter	cept	0.29010
_	0%	0.0%	Avg %DIII A	Max 70 DI		Cert Date	1/14/202	20 Corr	Coff	0.99999
			Tfee Derry	Tfor Co		C:ta	Cite IIit	DalDar	D:f	Al-Dif
UseDescri		ConcGroup	Tfer Raw 0.36	Tfer Co 0.06	orr	Site -1.20	Site Unit ppb	RelPer		AbsDif -1.26
prima	•	2	14.01	13.72			ppb			-2
prima	•	3	34.40	34.12			ppb		-8.18	
prima	ry	4	67.55	67.29		63.07	ppb		-6.47	
prima	ry	5	109.80	109.56	5	104.10	ppb		-5.11	
Sensor C	ompone	nt Audit Pressu	ire	Con	ditio	n 716.5 mmHg		Status	pass	
Sensor C	ompone	nt Sample Trai	n	Con	ditio	n Good		Status	pass	
Sensor C	ompone	nt Minimum dis	stance from road	I met Con	ditio	n True		Status	pass	
Sensor C	ompone	nt Inlet Filter C	ondition	Con	ditio	n Moderately clea	an	Status	pass	
Sensor C	ompone	nt 26.6 degree	unobstructed ru	le Con	ditio	n True		Status	pass	
Sensor C	ompone	nt Tree dewline	e >10m or below	inlet Con	ditio	n True		Status	pass	
Sensor C	ompone	nt Offset		Con	ditio	<b>n</b> 0.000		Status	pass	
Sensor C	ompone	nt Span		Con	ditio	<b>n</b> 1.008		Status	pass	
Sensor C	ompone	nt Zero Voltage	)	Con	ditio	n N/A		Status	pass	
Sensor C	ompone	nt Fullscale Vo	ltage	Con	ditio	n N/A		Status	pass	
Sensor C	ompone	nt Cell A Freq.		Con	ditio	<mark>n</mark> 94.7 kHz		Status	pass	
Sensor C	ompone	nt Cell A Noise		Con	ditio	<b>n</b> 0.8 ppb		Status	pass	
Sensor C	ompone	nt Cell A Flow		Con	ditio	<mark>n</mark> 0.70 lpm		Status	pass	
Sensor C	ompone	nt Cell A Press	ure	Con	ditio	<b>n</b> 697.2 mmHg		Status	pass	
Sensor C	ompone	nt Cell A Tmp.		Con	ditio	n 36.5 C		Status	pass	
Sensor C	ompone	nt Cell B Freq.		Con	ditio	<mark>n</mark> 95.9 kHz		Status	pass	
Sensor C	ompone	nt Cell B Noise		Con	ditio	<b>n</b> 0.8 ppb		Status	pass	
Sensor C	ompone	nt Cell B Flow		Con	ditio	<mark>n</mark> 0.61 lpm		Status	pass	
Sensor C	ompone	nt Cell B Press	ure	Con	ditio	<mark>n</mark> 698.1 mmHg		Status	pass	
Sensor C	ompone	nt Line Loss		Con	ditio	n Not tested		Status	pass	
Sensor C	ompone	nt System Men	no	Con	ditio	n		Status	pass	