2018 – 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

% diff	percent difference
A/D	analog to digital converter
ARS	Air Resource Specialist, Inc.
ASTM	American Society for Testing and Materials
CASTNET	Clean Air Status and Trends Network
DAS	data acquisition system
DC	direct current
deg	degree
DVM	digital voltmeter
EEMS	Environmental, Engineering & Measurement Services, Inc.
EPA	U.S. Environmental Protection Agency
ESC	Environmental Systems Corporation
FSAD	Field Site Audit Database
GPS	geographical positioning system
lpm	liters per minute
MLM	Multilayer Model
m/s	meters per second
mv	milivolt
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
QAPP	Quality Assurance Project Plan
SOP	standard operating procedure
TEI	Thermo Environmental Instruments
USNO	United States Naval Observatory
V	volts
WRR	World Radiation Reference

1.0 CASTNET Quarterly Report

1.1 Introduction

The Clean Air Status and Trends Network (CASTNET) is a national air monitoring program developed under mandate of the 1990 Clean Air Act Amendments. Each site in the network measures acidic gases and particles and other forms of atmospheric pollution using a continuous collection filter aggregated over a one week period. Hourly averages of surface ozone concentrations and selected meteorological variables are also measured.

Site measurements 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 effects research.

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

As of June 2018, the network is comprised of 95 active rural sampling sites across the United States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment and Climate Change Canada (ECCC), Bureau of Land Management (BLM) and several independent partners. AMEC-FW is responsible for operating the EPA and ECCC sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS and BLM 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 evaluated 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. Six EPA sponsored sites that are operated by AMEC-FW continue to operator meteorological sensors. Those sites are BEL116, BVL30, CHE185, IRL141, PAL190, and PND165. Five sites in WY sponsored by EPA and operated by the BLM/ARS also operate meteorological sensors and are BAS601, NEC602, BUF603, FOR605, and SHE604. Meteorological sensors at site FOR605 were audited during this reporting period.

Some or all of the additional monitored variables, NOy, CO, and SO_2 have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, GRS420, MAC426, ROM206, and BEL116. None of those variables were audited during this reporting period.

Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Precipitation	Response	10 manual tips	1 DAS count per tip
Precipitation	Accuracy	2 introductions of known amounts of water	≤ ±10.0% of input amount
Relative Humidity	Accuracy	Compared to reference instrument or standard solution	≤ ±10.0% RH
Solar Radiation	Accuracy	Compared to WRR traceable standard	≤ ±10.0% of daytime average
Surface Wetness	Response	Distilled water spray mist	Positive response
Surface Wetness	Sensitivity	1% decade resistance	N/A
Temperature	Accuracy	Comparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)	≤ ± 0.5° C
Temperature Difference	Accuracy	Comparison to station temperature sensor	≤ ± 0.50° C
Shelter Temperature	Accuracy	Comparison to station temperature sensor	≤ ± 2.0° C
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	≤ ±5° from degrees true
Wind Direction	Linearity	Eight cardinal points on test fixture	≤ ±5° mean absolute error
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	≤ ±0.5 mps below 5.0 mps input; ≤ ±5.0% of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	≤ ± 5.0% of designated rate
Ozone	Slope	Linear regression of multi-point test gas concentration as measured with a certified transfer standard	0.9000 ≤ m ≤ 1.1000
Ozone	Intercept		-5.0 ppb ≤ b ≤ 5.0 ppb
Ozone	Correlation Coefficient		0.9950 ≤ r
Ozone	Percent Difference	Comparison with Level 2 standard concentration	≤ ±15.1% of test gas concentration
DAS	Accuracy	Comparison with certified standard	≤ ± 0.003 VDC

Performance audits are conducted using standards that are traceable to the National Institute of Standards and Technology (NIST), or another authoritative organization, and certified as current.

Site systems audits 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 2018

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 2018. The locations and dates of the site visits for complete audits are presented in Table 2.

Table 2. Site Audit Visits

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
CAN407	FSA+Flow+Ozone	NPS	4/3/2018	Canyonlands NP
JOT403	FSA+Flow+Ozone	NPS	4/5/2018	Joshua Tree NM
IRL141	FSA+Flow+Ozone	EPA	4/10/2018	Indian River Lagoon
SUM156	FSA+Flow+Ozone	EPA	4/12/2018	Sumatra
PET427	FSA+Flow+Ozone	NPS	4/16/2018	Petrified Forest NP
GRC474	FSA+Flow+Ozone	NPS	4/17/2018	Grand Canyon NP
CHA467	FSA+Flow+Ozone	NPS	4/19/2018	Chiricahua NM
GAS153	FSA+Flow+Ozone	EPA	5/10/2018	Georgia Station
SND152	FSA+Flow+Ozone	EPA	5/11/2018	Sand Mountain
ESP127	FSA+Flow+Ozone	EPA	5/12/2018	Edgar Evins St. Park
SPD111	FSA+Flow+Ozone	EPA	5/13/2018	Speedwell
DIN431	FSA+Flow+Ozone	NPS	5/17/2018	Dinosaur NM
FOR605	Meteorology+FSA+Flow	EPA+BLM	6/6/2018	Fortification Creek

In addition to the sites listed in Table 2 that were visited for complete audits, the sites listed in Table 3 were visited to conduct Through-The-Probe (TTP) pollutant Performance Evaluations (PE).

Table 3. TTP Pollutant PE Visits

Side ID	PE Audit Type	Sponsor	Site Visit Date	Station Name
ZIO433	Ozone	NPS	4/6/2018	Zion National Park
BBE401	Ozone	NPS	4/23/2018	Big Bend NP
ALC188	Ozone	EPA	4/26/2018	Alabama-Coushatta
BAS601	Ozone	EPA+BLM	6/4/2018	Basin
NEC602	Ozone	EPA+BLM	6/6/2018	Newcastle
CVL151	Ozone	EPA	6/15/2018	Coffeeville
CAD150	Ozone	EPA	6/16/2018	Caddo Valley
CHE185	Ozone	EPA	6/17/2018	Cherokee Nation
CDZ171	Ozone	EPA	6/23/2018	Cadiz

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

2.0 NADP Quarterly Report

2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates three 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 Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992 and currently measures event based precipitation events at 6 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 120 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 NADP Program Office (PO) operates and administers the three precipitation chemistry networks (NTN, MDN and AIRMoN), two atmospheric concentration networks (AMNet and AMoN), two analytical laboratories (the Central Analytical Laboratory (CAL) located at the University of Illinois/Illinois State Water Survey and the Mercury Analytical Laboratory (HAL) located at Frontier Global Sciences), and the network equipment depot (NED).

As of March 2018 the PO and NED have moved to the Wisconsin State Lab of Hygiene (WSLH) located at the University of Wisconsin in Madison WI. The CAL is scheduled to move to WSLH during the summer of 2018.

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 2018

This report covers the results from the NADP sites surveyed during the first quarter (April through June) of 2018. The station names and dates of the audits are presented in Table 4.

Table 4. Sites Surveyed – Second Quarter 2018

Side ID	**Network**	**Visit Date**	**Station Name**
AL99	AMoN	5/11/2018	Sand Mountain Research & Extension Center
AR03	AMoN	6/16/2018	Caddo Valley
AZ03	NTN	4/17/2018	Grand Canyon National Park-Hopi Point
AZ98	AMoN	4/19/2018	Chiricahua Nm
BC16	MDN	6/27/2018	Saturna Island
CA67	AMoN	4/5/2018	Joshua Tree National Park-Black Rock
CO09	NTN	5/31/2018	Kawaneechee Meadow
CO22	NTN	5/1/2018	Pawnee
CO90	NTN	5/22/2018	Niwot Ridge-Southeast
CO94	NTN	5/22/2018	Sugarloaf
FL19	AMoN	4/10/2018	Indian River Lagoon
FL23	AMoN	4/12/2018	Sumatra
GA41	AMoN	5/10/2018	Georgia Station
IA23	NTN	5/9/2018	Mcnay Research Center
KS32	MDN/NTN	5/7/2018	Lake Scott State Park
KY98	AMoN	6/23/2018	Cadiz
MO03	NTN	6/18/2018	Ashland Wildlife Area
MO05	NTN	6/19/2018	University Forest
MO46	MDN	6/19/2018	Mingo National Wildlife Refuge
MS30	AMoN	6/15/2018	Coffeevile

Side ID	**Network**	**Visit Date**	**Station Name**
MT00	NTN	6/5/2018	Little Bighorn Battlefield National Monument
NE15	MDN/NTN	5/10/2018	Mead
NE99	NTN	5/11/2018	North Platte Agricultural Experiment Station
NV03	NTN	6/20/2018	Smith Valley
OK99	AMoN	6/17/2018	Cherokee Nation
TN04	AMoN	5/13/2018	Speedwell
TN07	AMoN	5/12/2018	Edgar Evins St. Park
TX22	NTN	4/24/2018	Guadalupe Mnt. Np
TX41	AMoN	4/26/2018	Alabama-Coushatta
UT01	NTN/AMoN	5/15/2018	Canyonlands National Park-Island in the Sky
UT09	NTN	4/3/2018	Canyonlands National Park-Island In The Sky
UT95	NTN	5/16/2018	East McKee
UT99	NTN	4/4/2018	Bryce Canyon National Park-Repeater Hill
WA03	MDN	6/29/2018	Makah National Fish Hatchery
WA14	NTN	6/29/2018	Olympic National Park-Hoh Ranger Station
WA18	MDN	6/26/2018	Seattle/NOAA
WA19	NTN	6/28/2018	North Cascades National Park-Marblemount Ranger Station
WA21	NTN	6/25/2018	La Grande
WA99	NTN/AMoN	6/25/2018	Mount Rainier National Park-Tahoma Washington
WY93	AMoN	6/4/2018	Basin – Big Horn

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 EEMS' server where the NADP PO and the U.S. EPA POs can access them and download them as needed by login into the server site.

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

APPENDIX A

CASTNET Audit Report Forms

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAN407-Martin Valvur-04/03/2018						
1	4/3/2018	Computer	Hewlett Packard	none	EliteBook	CNV1360668
2	4/3/2018	DAS	Environmental Sys Corp	90665	8816	2689
3	4/3/2018	Elevation	Elevation	None	1	None
4	4/3/2018	Filter pack flow pump	Thomas	none	107CA18	079600005251
5	4/3/2018	flow rate	Mykrolis	03388	FC280SAV-4S	AW9403022
6	4/3/2018	Infrastructure	Infrastructure	none	none	none
7	4/3/2018	Met tower	Universal Tower	01357	unknown	none
8	4/3/2018	MFC power supply	Tylan	03678	RO-32	none
9	4/3/2018	Modem	Sierra wireless	none	GX450	LA54620441001003
10	4/3/2018	Ozone	ThermoElectron Inc	none	49i A3NAA	1030745086
11	4/3/2018	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1030745084
12	4/3/2018	Sample Tower	Aluma Tower	illegible	B	none
13	4/3/2018	Shelter Temperature	ARS	none	none	none
14	4/3/2018	Siting Criteria	Siting Criteria	None	1	None
15	4/3/2018	Temperature2meter	Climatronics	none	100093	5708
16	4/3/2018	Zero air pump	Twin Tower Engineering	90721	TT70/E4	526297

DAS Data Form

DAS Time Max Error: 1

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2689	CAN407	Martin Valvur	04/03/2018	DAS	Primary

Das Date: 4 /3 /2018
Das Time: 10:38:00
Das Day: 93

Audit Date 4 /3 /2018
Audit Time 10:37:00
Audit Day 93

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

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

Mfg Fluke
Parameter DAS
Serial Number 95740243
Tfer Desc. DVM
Tfer ID 01312
Slope 1.00000
Intercept 0.00000
Cert Date 2/14/2018
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
12	0.0000	-0.0005	-0.0003	V	V	0.0002
12	0.1000	0.0997	0.0997	V	V	0.0000
12	0.3000	0.2995	0.2996	V	V	0.0001
12	0.5000	0.5000	0.4999	V	V	-0.0001
12	0.7000	0.6997	0.6997	V	V	0.0000
12	0.9000	0.9000	0.9001	V	V	0.0001
12	1.0000	0.9991	0.9992	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Mykrolis	AW9403022	CAN407	Martin Valvur	04/03/2018	flow rate	03388

Mfg Tylan

SN/Owner ID none 03678

Parameter MFC power supply

Mfg BIOS **Parameter** Flow Rate

Serial Number 148613 **Tfer Desc.** BIOS 220-H

Tfer ID 01421

Slope 0.98450 **Intercept** 0.10300

Cert Date 3/1/2018 **CorrCoff** 1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
2.73%	3.08%		

Cal Factor Zero -0.006

Cal Factor Full Scale 5.338

Rotometer Reading: 3.4

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignal	PctDifference
primary	pump off	0.000	0.000	0.01	0.0000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.0000	0.03	l/m	l/m	
primary	test pt 1	2.990	2.930	2.81	0.0000	3.01	l/m	l/m	2.73%
primary	test pt 2	3.000	2.940	2.81	0.0000	3.01	l/m	l/m	2.38%
primary	test pt 3	2.980	2.920	2.81	0.0000	3.01	l/m	l/m	3.08%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	225 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030745086	CAN407	Martin Valvur	04/03/2018	Ozone	none

Slope:	0.99814	**Slope:**	0.00000
Intercept	-0.26156	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.4%	3.4%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00801	**Intercept**	-0.05199
Cert Date	9/11/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.14	0.19	0.27	ppb	
primary	2	16.64	16.55	15.99	ppb	-3.38%
primary	3	38.43	38.17	37.61	ppb	-1.47%
primary	4	68.96	68.46	68.16	ppb	-0.44%
primary	5	109.42	108.60	108.20	ppb	-0.37%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	-0.2	**Status**	pass
Sensor Component	Span	**Condition**	1.008	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	-0.015	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.000	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	93.9 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	605.3 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	31.8 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	101.2 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	604.7 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	5708	CAN407	Martin Valvur	04/03/2018	Temperature2meter	none

Mfg Fluke

Parameter Temperature

Serial Number 3275143

Tfer Desc. RTD

Tfer ID 01229

Slope 0.99986

Intercept -0.01977

Cert Date 1/24/2018

CorrCoff 1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.21	0.47		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.02	0.04	0.0000	0.13	C	0.09
primary	Temp Mid Rang	24.47	24.49	0.0000	24.41	C	-0.08
primary	Temp High Rang	47.97	48.00	0.0000	47.53	C	-0.47

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CAN407	Martin Valvur	04/03/2018	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
0.72	1.10

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Fluke

Parameter Shelter Temperatur

Serial Number 3275143

Tfer Desc. RTD

Tfer ID 01229

Slope 0.99986

Intercept -0.01977

Cert Date 1/24/2018

CorrCoff 1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.77	23.79	0.000	24.9	C	1.06
primary	Temp Mid Range	23.76	23.78	0.000	24.9	C	1.1
primary	Temp Mid Range	21.61	21.63	0.000	21.6	C	0.01

Sensor Component System Memo

Condition

Status pass

Infrastructure Data For

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 04/03/2018

Shelter Make	**Shelter Model**	**Shelter Size**
NPS	R46453	640 cuft

Sensor Component	Sample Tower Type	**Condition**	Type B	**Status**	pass
Sensor Component	Conduit	**Condition**	Good	**Status**	pass
Sensor Component	Met Tower	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Trap	**Condition**	Not 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	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:** SitingCriteriaCom

The small parking lot at the visitors center is approximately 100m to the northeast.

2 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 04/03/2018

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Musselman Arch
Operating Group	NPS	**Map Scale**	
AQS #	49-037-0101	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	woodland - mixed, desert range	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	(435) 259-4141	**Audit Latitude**	38.458323
Site Address 1	Visitors Center	**Audit Longitude**	-109.82126
Site Address 2	route 313	**Audit Elevation**	1794
County	San Juan	**Audit Declination**	11.6

			Present	
City, State	Moab, UT			
Zip Code	84532	**Fire Extinguisher**	☑	Inspected April 2015
Time Zone	Mountain	**First Aid Kit**	☑	in vehicle
Primary Operator		**Safety Glasses**	☐	
Primary Op. Phone #		**Safety Hard Hat**	☐	
Primary Op. E-mail		**Climbing Belt**	☐	
Backup Operator		**Security Fence**	☐	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑ **Make** NPS **Model** R46453 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is in good condition, well organized and well maintained.

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 04/03/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The small parking lot at the visitors center is approximately 100m to the northeast.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 04/03/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 04/03/2018

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 04/03/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 10 meters
4	Describe dry dep sample tube.		3/8 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 04/03/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☑

11 Tower comments?

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 04/03/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑		☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	Flow & observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 04/03/2018

Site operation procedures

1 Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? ☐

2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? ☐

3 Is the site visited regularly on the required Tuesday schedule? ☑

4 Are the standard CASTNET operational procedures being flollowed by the site operator? ☑

5 Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation) ☑

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Monthly	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Alarm values only weekly	☑
In-line Filter Replacement (at inlet)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	As needed	☑

1 Do multi-point calibration gases go through the complete sample train including all filters? ☑ Unknown

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 04/03/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	Dataview and SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID CAN407 **Technician** Martin Valvur **Site Visit Date** 04/03/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	EliteBook	CNV1360668	none
DAS	Environmental Sys Corp	8816	2689	90665
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	079600005251	none
flow rate	Mykrolis	FC280SAV-4S	AW9403022	03388
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	01357
MFC power supply	Tylan	RO-32	none	03678
Modem	Sierra wireless	GX450	LA54620441001003	none
Ozone	ThermoElectron Inc	49i A3NAA	1030745086	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1030745084	none
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	Climatronics	100093	5708	none
Zero air pump	Twin Tower Engineering	TT70/E4	526297	90721

Site Inventory by Site Visit

Site Visit	Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
JOT403-Martin Valvur-04/05/2018						
1	4/5/2018	DAS	Environmental Sys Corp	90599	8816	2271
2	4/5/2018	Elevation	Elevation	None	1	None
3	4/5/2018	Filter pack flow pump	Thomas	none	107CAB18B	070000013426
4	4/5/2018	flow rate	Tylan	03378	FC280AV	AW9403016
5	4/5/2018	Infrastructure	Infrastructure	none	none	none
6	4/5/2018	MFC power supply	Tylan	03683	RO-32	FP9403017
7	4/5/2018	Modem	Sixnet	none	BT6801	680X5215960043
8	4/5/2018	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460006
9	4/5/2018	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130950194
10	4/5/2018	Sample Tower	Aluma Tower	923310	B	none
11	4/5/2018	Shelter Temperature	ARS	none	none	none
12	4/5/2018	Siting Criteria	Siting Criteria	None	1	None
13	4/5/2018	Temperature2meter	RM Young	none	41342	14960
14	4/5/2018	Zero air pump	Werther International	none	PC70/4	606491

DAS Data Form

DAS Time Max Error: 0.95

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2271	JOT403	Martin Valvur	04/05/2018	DAS	Primary

Das Date: 4 /5 /2018

Das Time: 7:56:03

Das Day: 95

Audit Date 4 /5 /2018

Audit Time 7:57:00

Audit Day 95

Low Channel:

Avg Diff: 0.0001

Max Diff: 0.0002

High Channel:

Avg Diff: 0.0001

Max Diff: 0.0002

Mfg HY

Parameter DAS

Serial Number 12010039329

Tfer Desc. Source generator (D

Tfer ID 01322

Slope 1.00000

Intercept 0.00000

Cert Date 6/15/2014

CorrCoff 1.00000

Mfg Fluke

Parameter DAS

Serial Number 95740243

Tfer Desc. DVM

Tfer ID 01312

Slope 1.00000

Intercept 0.00000

Cert Date 2/14/2018

CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
3	0.0000	-0.0002	0.0000	V	V	0.0002
3	0.1000	0.0997	0.0999	V	V	0.0002
3	0.3000	0.2993	0.2993	V	V	0.0000
3	0.5000	0.4999	0.4999	V	V	0.0000
3	0.7000	0.7000	0.6998	V	V	-0.0002
3	0.9000	0.8999	0.9000	V	V	0.0001
3	1.0000	0.9996	0.9996	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403016	JOT403	Martin Valvur	04/05/2018	flow rate	03378

Mfg Tylan

SN/Owner ID FP9403017 03683

Parameter MFC power supply

Mfg BIOS

Parameter Flow Rate

Serial Number 148613

Tfer Desc. BIOS 220-H

Tfer ID 01421

Slope 0.98450

Intercept 0.10300

Cert Date 3/1/2018

CorrCoff 1.00000

DAS 1: A Avg % Diff:	A Max % Di	DAS 2: A Avg %Dif	A Max % Di
1.58%	1.69%		

Cal Factor Zero 0.024

Cal Factor Full Scale 5.58

Rotometer Reading: 3.2

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.09	0.0000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	-0.07	0.0000	-0.01	l/m	l/m	
primary	test pt 1	3.020	2.960	2.94	0.0000	3.01	l/m	l/m	1.69%
primary	test pt 2	3.030	2.970	2.94	0.0000	3.01	l/m	l/m	1.35%
primary	test pt 3	3.020	2.960	2.94	0.0000	3.01	l/m	l/m	1.69%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460006	JOT403	Martin Valvur	04/05/2018	Ozone	none

Slope:	1.00731	**Slope:**	0.00000
Intercept	0.20872	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.2%	1.8%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00801	**Intercept**	-0.05199
Cert Date	9/11/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.09	0.14	0.46	ppb	
primary	2	14.17	14.10	14.35	ppb	1.77%
primary	3	36.62	36.38	36.67	ppb	0.80%
primary	4	67.26	66.77	67.64	ppb	1.30%
primary	5	108.66	107.84	108.80	ppb	0.89%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	-0.3	**Status**	pass
Sensor Component	Span	**Condition**	1.026	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.04	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.000	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	84.2 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.72 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	654.5 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	35.3 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	78.2 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.70 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	653.6 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14960	JOT403	Martin Valvur	04/05/2018	Temperature2meter	none

Mfg Fluke **Parameter** Temperature

Serial Number 3275143 **Tfer Desc.** RTD

Tfer ID 01229

Slope 0.99986 **Intercept** -0.01977

Cert Date 1/24/2018 **CorrCoff** 1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.13	0.16		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.13	0.15	0.0000	-0.01	C	-0.16
primary	Temp Mid Rang	25.73	25.75	0.0000	25.60	C	-0.15
primary	Temp High Rang	45.47	45.50	0.0000	45.41	C	-0.09

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	JOT403	Martin Valvur	04/05/2018	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
0.58	0.69

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Fluke

Parameter Shelter Temperatur

Serial Number 3275143

Tfer Desc. RTD

Tfer ID 01229

Slope 0.99986

Intercept -0.01977

Cert Date 1/24/2018

CorrCoff 1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.55	24.57	0.000	25.2	C	0.61
primary	Temp Mid Range	23.83	23.85	0.000	24.5	C	0.69
primary	Temp Mid Range	23.84	23.86	0.000	24.3	C	0.43

Sensor Component System Memo

Condition

Status pass

Infrastructure Data For

Site ID JOT403 **Technician** Martin Valvur **Site Visit Date** 04/05/2018

Shelter Make	Shelter Model	Shelter Size
ShelterOne	E8129-28036	768 cuft

Sensor Component	Sample Tower Type	**Condition**	Type B	**Status**	pass
Sensor Component	Conduit	**Condition**	Good	**Status**	pass
Sensor Component	Met Tower	**Condition**	Good	**Status**	pass
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	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:** ShelterCleanNotes

The shelter is only a few years old and is in good condition, clean and well organized but not grounded.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID JOT403 **Technician** Martin Valvur **Site Visit Date** 04/05/2018

Site Sponsor (agency)	NPS/EPA	**USGS Map**		Yucca Valley South
Operating Group	NPS	**Map Scale**		
AQS #	06-071-9002	**Map Date**		
Meteorological Type	RM Young			
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**		34.0714
Deposition Measurement	dry, wet	**QAPP Longitude**		-116.3906
Land Use	desert	**QAPP Elevation Meters**		1244
Terrain	complex	**QAPP Declination**		
Conforms to MLM	No	**QAPP Declination Date**		
Site Telephone	(760) 228-1927	**Audit Latitude**		34.069569
Site Address 1		**Audit Longitude**		-116.388933
Site Address 2		**Audit Elevation**		1243
County	San Bernardino	**Audit Declination**		12
City, State	Yacca Valley, CA		**Present**	
Zip Code	92284	**Fire Extinguisher**	☑	Inspected March 2014
Time Zone	Pacific	**First Aid Kit**	☑	
Primary Operator		**Safety Glasses**	☐	
Primary Op. Phone #		**Safety Hard Hat**	☐	
Primary Op. E-mail		**Climbing Belt**	☐	
Backup Operator		**Security Fence**	☐	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑ **Make** ShelterOne **Model** E8129-28036 **Shelter Size** 768 cuft

Shelter Clean ☑ **Notes** The shelter is only a few years old and is in good condition, clean and well organized but not grounded.

Site OK ☑ **Notes**

Driving Directions At the intersection of route 62 and route 247 in Yucca Valley, take Joshua Lane south (route 247). Follow the signs for Joshua Tree National Monument. The site is up the dirt road through the locked gate (cable) toward the water tower. (gate lock = 1123 shelter lock = 5570)

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID JOT403 **Technician** Martin Valvur **Site Visit Date** 04/05/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form F-02058-1500-S3-rev002

Site ID JOT403 **Technician** Martin Valvur **Site Visit Date** 04/05/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID JOT403 **Technician** Martin Valvur **Site Visit Date** 04/05/2018

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID JOT403

Technician Martin Valvur

Site Visit Date 04/05/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID JOT403

Technician Martin Valvur

Site Visit Date 04/05/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	Met sensors only
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☐	Shelter not grounded
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☐

11 Tower comments? The sample tower is bolted to the shelter

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID JOT403 **Technician** Martin Valvur **Site Visit Date** 04/05/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑		☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	Flow & observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form F-02058-1500-S8-rev002

Site ID JOT403 **Technician** Martin Valvur **Site Visit Date** 04/05/2018

Site operation procedures

1 Has the site operator attended a formal CASTNET training course? If yes, when and who instructed? ☑ ARS provides refresher training during maintenance visits

2 Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed? ☐

3 Is the site visited regularly on the required Tuesday schedule? ☑

4 Are the standard CASTNET operational procedures being flollowed by the site operator? ☑

5 Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation) ☑

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

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

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

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

1 Do multi-point calibration gases go through the complete sample train including all filters? ☑

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID JOT403 **Technician** Martin Valvur **Site Visit Date** 04/05/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings (50%)
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Every 2 weeks	☑
Sample Line Check for Dirt/Water	☐		☐

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

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID JOT403 **Technician** Martin Valvur **Site Visit Date** 04/05/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8816	2271	90599
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	070000013426	none
flow rate	Tylan	FC280AV	AW9403016	03378
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9403017	03683
Modem	Sixnet	BT6801	680X5215960043	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460006	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1130950194	none
Sample Tower	Aluma Tower	B	none	923310
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	14960	none
Zero air pump	Werther International	PC70/4	606491	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
IRL141-Sandy Grenville-04/10/2018						
1	4/10/2018	Computer	Dell	007024	Inspiron 15	8W2MC12
2	4/10/2018	DAS	Campbell	000340	CR3000	2119
3	4/10/2018	Elevation	Elevation	None	1	None
4	4/10/2018	Filter pack flow pump	Thomas	02759	107CAB18	1192001899
5	4/10/2018	Flow Rate	Apex	000593	AXMC105LPMDPCV	illegible
6	4/10/2018	Infrastructure	Infrastructure	none	none	none
7	4/10/2018	Modem	Raven	06384	H4222-C	0802310499
8	4/10/2018	Ozone	ThermoElectron Inc	000609	49i A1NAA	1009241782
9	4/10/2018	Ozone Standard	ThermoElectron Inc	000446	49i A3NAA	CM08200022
10	4/10/2018	Sample Tower	Aluma Tower	000020	B	AT-61152-A-H8-F
11	4/10/2018	Shelter Temperature	Campbell	none	107-L	none
12	4/10/2018	Siting Criteria	Siting Criteria	None	1	None
13	4/10/2018	Temperature	RM Young	illegible	41342VC	14804
14	4/10/2018	Zero air pump	Werther International	06909	C 70/4	000829161

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2119	IRL141	Sandy Grenville	04/10/2018	DAS	Primary

Das Date: 4 /10/2018
Das Time: 9:40:34
Das Day: 100

Audit Date 4 /10/2018
Audit Time 9:40:34
Audit Day 100

Low Channel:

Avg Diff: 0.0000
Max Diff: 0.0002

High Channel:

Avg Diff: 0.0000
Max Diff: 0.0002

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

Mfg Fluke
Parameter DAS
Serial Number 95740135
Tfer Desc. DVM
Tfer ID 01311
Slope 1.00000
Intercept 0.00000
Cert Date 2/13/2018
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6995	0.6995	V	V	0.0000
7	0.9000	0.8993	0.8993	V	V	0.0000
7	1.0000	0.9993	0.9991	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	IRL141	Sandy Grenville	04/10/2018	Flow Rate	000593

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 220-H
Tfer ID	01414		
Slope	1.00055	**Intercept**	-0.01570
Cert Date	2/21/2018	**CorrCoff**	1.00000

DAS 1:

DAS 2:

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
1.10%	1.32%		

Cal Factor Zero -0.01

Cal Factor Full Scale 0.97

Rotometer Reading: 1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	-0.01	l/m	l/m	
primary	test pt 1	1.498	1.510	1.54	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 2	1.502	1.520	1.54	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.501	1.520	1.54	0.000	1.50	l/m	l/m	-1.32%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.8 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
ThermoElectron Inc	1009241782	IRL141	Sandy Grenville	04/10/2018	Ozone	000609

Slope:	0.99181	**Slope:**	0.00000
Intercept	0.26706	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.7%	1.1%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00504	**Intercept**	0.32915
Cert Date	9/12/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.10	-0.22	0.20	ppb	
primary	2	15.10	14.69	14.80	ppb	0.75%
primary	3	35.10	34.59	34.20	ppb	-1.13%
primary	4	67.90	67.23	67.30	ppb	0.10%
primary	5	109.90	109.02	108.30	ppb	-0.66%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.20	**Status**	pass
Sensor Component	Span	**Condition**	1.016	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	96.2 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.73 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	731.8 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	32.2 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	98.7 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.73 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	732.1 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14804	IRL141	Sandy Grenville	04/10/2018	Temperature	illegible

Mfg Extech **Parameter** Temperature

Serial Number H232734 **Tfer Desc.** RTD

Tfer ID 01227

Slope 1.00798 **Intercept** 0.09168

Cert Date 2/13/2018 **CorrCoff** 1.00000

DAS 1: Abs Avg Err	DAS 1: Abs Max Er	DAS 2: Abs Avg Err	DAS 2: Abs Max Er
0.26	0.63		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.14	0.05	0.000	0.1	C	0.03
primary	Temp Mid Range	25.15	24.86	0.000	24.7	C	-0.13
primary	Temp High Range	48.68	48.20	0.000	47.6	C	-0.63

Sensor Component Shield **Condition** Clean **Status** pass

Sensor Component Blower **Condition** Functioning **Status** pass

Sensor Component Blower Status Switch **Condition** N/A **Status** pass

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	IRL141	Sandy Grenville	04/10/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.40	0.83		

Mfg	Extech	**Parameter**	Shelter Temperatur
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00798	**Intercept**	0.09168
Cert Date	2/13/2018	**CorrCoff**	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.08	22.81	0.000	23.0	C	0.17
primary	Temp Mid Range	25.02	24.73	0.000	25.6	C	0.83
primary	Temp Mid Range	24.68	24.39	0.000	24.6	C	0.19

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

Infrastructure Data For

Site ID IRL141 **Technician** Sandy Grenville **Site Visit Date** 04/10/2018

Shelter Make	**Shelter Model**	**Shelter Size**
Ekto	8810	640 cuft

Sensor Component	Sample Tower Type	**Condition**	Type B	**Status**	pass
Sensor Component	Conduit	**Condition**	N/A	**Status**	pass
Sensor Component	Met Tower	**Condition**	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**	Fair	**Status**	pass
Sensor Component	Shelter Roof	**Condition**	Fair	**Status**	pass
Sensor Component	Shelter Floor	**Condition**	Poor	**Status**	pass
Sensor Component	Signal Cable	**Condition**	Fair	**Status**	pass
Sensor Component	Tubing Type	**Condition**	3/8 teflon	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	IRL141	Sandy Grenville	04/10/2018	Moisture Present	Apex	4169	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is doing an excellent job of handling and changing the filter pack.

2 **Parameter:** SiteOpsProcedures

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

3 **Parameter:** SitingCriteriaCom

Sebastian has an estimated population of 18,000. The park operates a boat ramp with vehicle parking near the site. The site is surrounded on three sides by boat traffic using the ramp.

4 **Parameter:** ShelterCleanNotes

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

5 **Parameter:** MetOpMaintCom

The meteorological signals were not functioning upon arrival. The site operator removed the relative humidity signal which returned other signals to normal. Signal cables are showing signs of wear with some missing insulation and bear wires.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID IRL141 **Technician** Sandy Grenville **Site Visit Date** 04/10/2018

Site Sponsor (agency)	EPA/SJRWMD	**USGS Map**	Sebastian
Operating Group	IRC Health Dept	**Map Scale**	
AQS #	12-061-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	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 Feb 2016
Time Zone	Eastern	**First Aid Kit**	☑	
Primary Operator		**Safety Glasses**	☑	
Primary Op. Phone #		**Safety Hard Hat**	☑	
Primary Op. E-mail		**Climbing Belt**	☑	
Backup Operator		**Security Fence**	☑	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is still clean and well organized.. The shelter floor and the bottom of the walls are severely rotting and now has extensive mold growth. It has deteriorated since the previous audit.

Site OK ☑ **Notes**

Driving Directions From I-95 take exit 180, east on 192 to AIA. Turn right (south) and proceed approximately 18 miles over the Sebastian Inlet bridge. Once over the bridge, turn right at the entrance to the park and check in at the guard station. The site is at the west end of the road past the boat launch ramp.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID IRL141 **Technician** Sandy Grenville **Site Visit Date** 04/10/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km	5 to 10 km	☐
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m	100 m	☐
Small parking lot	100 m	10 - 20 m	☐
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☐

Siting Criteria Comment

Sebastian has an estimated population of 18,000. The park operates a boat ramp with vehicle parking near the site. The site is surrounded on three sides by boat traffic using the ramp.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID IRL141

Technician Sandy Grenville

Site Visit Date 04/10/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID IRL141 **Technician** Sandy Grenville **Site Visit Date** 04/10/2018

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

Provide any additional 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 signals were not functioning upon arrival. The site operator removed the relative humidity signal which returned other signals to normal. Signal cables are showing signs of wear with some missing insulation and bear wires.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID IRL141 **Technician** Sandy Grenville **Site Visit Date** 04/10/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 15 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☐	Moisture in tubing only
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID IRL141

Technician Sandy Grenville

Site Visit Date 04/10/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☑

11 Tower comments?

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID IRL141 **Technician** Sandy Grenville **Site Visit Date** 04/10/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Feb 2014	☑
HASP	☑	Feb 2014	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☑		☑
Preventive maintenance schedul	☐		☐

1 Is the station log properly completed during every site visit? ☑

2 Are the Site Status Report Forms being completed and current? ☑

3 Are the chain-of-custody forms properly used to document sample transfer to and from lab? ☑

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID IRL141 **Technician** Sandy Grenville **Site Visit Date** 04/10/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	on-site 7/9/2001 by MACTEC employee EOH
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID IRL141 **Technician** Sandy Grenville **Site Visit Date** 04/10/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

The site operator is doing an excellent job of handling and changing the filter pack.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID IRL141 **Technician** Sandy Grenville **Site Visit Date** 04/10/2018

Site Visit Sensors

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	illegible	000593
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0802310499	06384
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	C 70/4	000829161	06909

Site Inventory by Site Visit

Site Visit	Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
SUM156-Sandy Grenville-04/12/2018						
1	4/12/2018	Computer	Dell	07029	Inspiron 15	Unknown
2	4/12/2018	DAS	Campbell	000335	CR3000	2114
3	4/12/2018	Elevation	Elevation	None	1	None
4	4/12/2018	Filter pack flow pump	Thomas	00235	107CA18	00688001783
5	4/12/2018	Flow Rate	Apex	000685	AXMC105LPMDPCV	illegible
6	4/12/2018	Infrastructure	Infrastructure	none	none	none
7	4/12/2018	Ozone	ThermoElectron Inc	000724	49i A1NAA	1105347328
8	4/12/2018	Ozone Standard	ThermoElectron Inc	000511	49i A3NAA	0922236888
9	4/12/2018	Sample Tower	Aluma Tower	03542	A	none
10	4/12/2018	Shelter Temperature	Campbell	none	107-L	none
11	4/12/2018	Siting Criteria	Siting Criteria	None	1	None
12	4/12/2018	Temperature	RM Young	05043	41342VO	9639
13	4/12/2018	Zero air pump	Werther International	06897	C 70/4	000821893

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2114	SUM156	Sandy Grenville	04/12/2018	DAS	Primary

Das Date: 4 /12/2018
Das Time: 10:27:20
Das Day: 102

Audit Date 4 /12/2018
Audit Time 10:27:20
Audit Day 102

Low Channel:

Avg Diff: 0.0001
Max Diff: 0.0001

High Channel:

Avg Diff: 0.0001
Max Diff: 0.0001

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

Mfg Fluke
Parameter DAS
Serial Number 95740135
Tfer Desc. DVM
Tfer ID 01311
Slope 1.00000
Intercept 0.00000
Cert Date 2/13/2018
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2996	0.2997	V	V	0.0001
7	0.5000	0.4995	0.4995	V	V	0.0000
7	0.7000	0.6994	0.6994	V	V	0.0000
7	0.9000	0.8993	0.8992	V	V	-0.0001
7	1.0000	0.9991	0.9990	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	SUM156	Sandy Grenville	04/12/2018	Flow Rate	000685

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 220-H
Tfer ID	01414		
Slope	1.00055	**Intercept**	-0.01570
Cert Date	2/21/2018	**CorrCoff**	1.00000

DAS 1:

DAS 2:

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
2.17%	2.60%		

Cal Factor Zero 0

Cal Factor Full Scale 1

Rotometer Reading: 1.35

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.00	l/m	l/m	
primary	test pt 1	1.518	1.530	1.51	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 2	1.522	1.540	1.50	0.000	1.50	l/m	l/m	-2.60%
primary	test pt 3	1.512	1.530	1.50	0.000	1.50	l/m	l/m	-1.96%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347328	SUM156	Sandy Grenville	04/12/2018	Ozone	000724

Slope:	1.00155	**Slope:**	0.00000
Intercept	-1.06424	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.5%	4.9%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00504	**Intercept**	0.32915
Cert Date	9/12/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.04	-0.28	-1.65	ppb	
primary	2	15.30	14.89	14.16	ppb	-4.90%
primary	3	35.00	34.49	33.70	ppb	-2.29%
primary	4	68.70	68.02	66.76	ppb	-1.85%
primary	5	110.00	109.12	108.30	ppb	-0.75%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.7	**Status**	pass
Sensor Component	Span	**Condition**	1.015	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	110.6 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.3 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.73 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	714.2 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	37.1 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	97.6 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.66 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	713.5 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
RM Young	9639	SUM156	Sandy Grenville	04/12/2018	Temperature	05043

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00798	**Intercept**	0.09168
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.22	0.29		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.15	0.06	0.000	0.4	C	0.29
primary	Temp Mid Range	24.90	24.61	0.000	24.4	C	-0.23
primary	Temp High Range	49.63	49.15	0.000	49.0	C	-0.15

Sensor Component	Shield	**Condition**	Dirty	**Status**	Fail
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	SUM156	Sandy Grenville	04/12/2018	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
0.91	1.39

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232734

Tfer Desc. RTD

Tfer ID 01227

Slope 1.00798

Intercept 0.09168

Cert Date 2/13/2018

CorrCoff 1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.80	26.50	0.000	26.0	C	-0.55
primary	Temp Mid Range	28.50	28.18	0.000	27.4	C	-0.79
primary	Temp Mid Range	23.24	22.97	0.000	24.4	C	1.39

Sensor Component System Memo

Condition

Status pass

Infrastructure Data For

Site ID SUM156 **Technician** Sandy Grenville **Site Visit Date** 04/12/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component	Sample Tower Type	**Condition**	Type A	**Status**	pass
Sensor Component	Conduit	**Condition**	Good	**Status**	pass
Sensor Component	Met Tower	**Condition**	N/A	**Status**	pass
Sensor Component	Moisture Trap	**Condition**	Installed	**Status**	pass
Sensor Component	Power Cables	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Temp Control	**Condition**	Functioning	**Status**	pass
Sensor Component	Rotometer	**Condition**	Installed	**Status**	pass
Sensor Component	Sample Tower	**Condition**	Fair	**Status**	pass
Sensor Component	Shelter Condition	**Condition**	Fair	**Status**	pass
Sensor Component	Shelter Door	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Roof	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Floor	**Condition**	Fair	**Status**	pass
Sensor Component	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.	Hazard	Problem
Flow Rate	SUM156	Sandy Grenville	04/12/2018	Moisture Present	Apex	4171	☐	☐

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

Field Systems Comments

1 **Parameter:** DasComments

The meteorological tower has been removed. The temperature sensor is mounted in a naturally aspirated shield on the sample tower which is not grounded.

2 **Parameter:** SitingCriteriaCom

The site is surrounded by pine trees on land managed by the forest service. A few trees are now 17 meters tall and within 17 meters of the sample tower. Most trees are 30 meters from the sample tower.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.. The site operator does an excellent job of organizing and maintaining the site.

4 **Parameter:** PollAnalyzerCom

There is water in the flow tubing outside the shelter. Trees to the north are less than 20 meters from the sample inlets.

5 **Parameter:** MetOpMaintCom

The temperature sensor shield is dirty and the signal cable is showing signs of wear.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID SUM156 **Technician** Sandy Grenville **Site Visit Date** 04/12/2018

Site Sponsor (agency)	EPA/USFS	**USGS Map**		Sumatra
Operating Group	USFS/private	**Map Scale**		
AQS #	12-077-9991	**Map Date**		
Meteorological Type	R.M. Young			
Air Pollutant Analyzer	Ozone	**QAPP Latitude**		
Deposition Measurement	dry, wet	**QAPP Longitude**		
Land Use	wetlands, woodland - evergreen	**QAPP Elevation Meters**		
Terrain	flat	**QAPP Declination**		
Conforms to MLM	Yes	**QAPP Declination Date**		
Site Telephone	(850) 670-8376	**Audit Latitude**		30.110226
Site Address 1	Rt 65	**Audit Longitude**		-84.99038
Site Address 2	Apalachicola National Forest	**Audit Elevation**		16
County	Liberty	**Audit Declination**		-3
City, State	Bristol, FL		**Present**	
Zip Code	32321	**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	none	**Climbing Belt**	☐	
Backup Operator	none	**Security Fence**	☐	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is clean and well organized.. The site operator does an excellent job of organizing and maintaining the site.

Site OK ☑ **Notes**

Driving Directions From Tallahassee take Hwy 20 west about 25 miles to Hosford. Turn left (south) on Hwy 65 at the intersection in Hosford. Continue about 22 miles on Hwy 65 past Wilma. Turn right on a dirt road and bear left continuing south parallel to Hwy 65. The site will be visible on the right.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID SUM156 **Technician** Sandy Grenville **Site Visit Date** 04/12/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	17 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The site is surrounded by pine trees on land managed by the forest service. A few trees are now 17 meters tall and within 17 meters of the sample tower. Most trees are 30 meters from the sample tower.

Field Systems Data Form F-02058-1500-S3-rev002

Site ID SUM156 **Technician** Sandy Grenville **Site Visit Date** 04/12/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID SUM156

Technician Sandy Grenville

Site Visit Date 04/12/2018

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

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

The temperature sensor shield is dirty and the signal cable is showing signs of wear.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID SUM156 **Technician** Sandy Grenville **Site Visit Date** 04/12/2018

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

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☐	Trees 17 meters

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 15 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☐	Moisture in tubing only
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

There is water in the flow tubing outside the shelter. Trees to the north are less than 20 meters from the sample inlets.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID SUM156 **Technician** Sandy Grenville **Site Visit Date** 04/12/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☐

11 Tower comments?

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

The meteorological tower has been removed. The temperature sensor is mounted in a naturally aspirated shield on the sample tower which is not grounded.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID SUM156 **Technician** Sandy Grenville **Site Visit Date** 04/12/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2010	☐
HASP	☑	Oct 2010	☐
Field Ops Manual	☐		☐
Calibration Reports	☐	2/2/2016	☑
Ozone z/s/p Control Charts	☐		☑
Preventive maintenance schedul	☐		☑

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form F-02058-1500-S8-rev002

Site ID SUM156 **Technician** Sandy Grenville **Site Visit Date** 04/12/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained on-site in 1989
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID SUM156 **Technician** Sandy Grenville **Site Visit Date** 04/12/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID SUM156 **Technician** Sandy Grenville **Site Visit Date** 04/12/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07029
DAS	Campbell	CR3000	2114	000335
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	00688001783	00235
Flow Rate	Apex	AXMC105LPMDPC	illegible	000685
Infrastructure	Infrastructure	none	none	none
Ozone	ThermoElectron Inc	49i A1NAA	1105347328	000724
Ozone Standard	ThermoElectron Inc	49i A3NAA	0922236888	000511
Sample Tower	Aluma Tower	A	none	03542
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	9639	05043
Zero air pump	Werther International	C 70/4	000821893	06897

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
PET427-Martin Valvur-04/16/2018						
1	4/16/2018	Computer	Hewlett Packard	none	6560 b	5CB22906TB
2	4/16/2018	DAS	Environmental Sys Corp	90641	8816	2526
3	4/16/2018	Elevation	Elevation	None	1	None
4	4/16/2018	Filter pack flow pump	Thomas	none	107CAB18B	071100039615
5	4/16/2018	Flow Rate	Alicat	none	MC-10SLPM-D-PCV	150339
6	4/16/2018	Infrastructure	Infrastructure	none	none	none
7	4/16/2018	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460048
8	4/16/2018	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1211052489
9	4/16/2018	Sample Tower	Aluma Tower	none	B	none
10	4/16/2018	Shelter Temperature	ARS	none	none	none
11	4/16/2018	Siting Criteria	Siting Criteria	None	1	None
12	4/16/2018	Temperature2meter	RM Young	none	41342	029201
13	4/16/2018	Zero air pump	Werther International	none	PC 70/4	531382

DAS Data Form

DAS Time Max Error: 0.33

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2526	PET427	Martin Valvur	04/16/2018	DAS	Primary

Das Date: 4 /16/2018

Das Time: 8:44:25

Das Day: 106

Audit Date 4 /16/2018

Audit Time 8:44:45

Audit Day 106

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

Mfg HY

Parameter DAS

Serial Number 12010039329

Tfer Desc. Source generator (D

Tfer ID 01322

Slope 1.00000

Intercept 0.00000

Cert Date 6/15/2014

CorrCoff 1.00000

Mfg Fluke

Parameter DAS

Serial Number 95740243

Tfer Desc. DVM

Tfer ID 01312

Slope 1.00000

Intercept 0.00000

Cert Date 2/14/2018

CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
14	0.0000	-0.0004	-0.0003	V	V	0.0001
14	0.1000	0.0996	0.0999	V	V	0.0003
14	0.3000	0.2995	0.2993	V	V	-0.0002
14	0.5000	0.4996	0.4996	V	V	0.0000
14	0.7000	0.6992	0.6992	V	V	0.0000
14	0.9000	0.8998	0.8997	V	V	-0.0001
14	1.0000	0.9996	0.9997	V	V	0.0001

Flow Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Alicat	150339	PET427	Martin Valvur	04/16/2018	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	0.98450	**Intercept**	0.10300
Cert Date	3/1/2018	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**		**Cal Factor Zero**	-0.015
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Full Scale**	5.028
0.39%	0.57%			**Rotometer Reading:**	3.45

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.0000	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.0000	-0.01	l/m	l/m	
primary	test pt 1	3.042	2.990	3.00	0.0000	3.01	l/m	l/m	0.57%
primary	test pt 2	3.044	2.990	3.00	0.0000	3.01	l/m	l/m	0.54%
primary	test pt 3	3.063	3.010	3.00	0.0000	3.01	l/m	l/m	-0.07%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.2 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460048	PET427	Martin Valvur	04/16/2018	Ozone	none

Slope:	0.99262	**Slope:**	0.00000
Intercept	-0.14499	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
1.4%	2.0%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00801	**Intercept**	-0.05199
Cert Date	9/11/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.26	0.30	0.43	ppb	
primary	2	13.81	13.75	13.48	ppb	-1.96%
primary	3	36.12	35.88	35.25	ppb	-1.76%
primary	4	69.50	68.99	68.08	ppb	-1.32%
primary	5	116.96	116.08	115.30	ppb	-0.67%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.1	**Status**	pass
Sensor Component	Span	**Condition**	0.997	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0002	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.0000	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	107.6 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	609.8 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	33.8 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	109.3 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	609.5 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	029201	PET427	Martin Valvur	04/16/2018	Temperature2meter	none

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99986	**Intercept**	-0.01977
Cert Date	1/24/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.66	0.76		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.03	0.05	0.0000	0.58	C	0.53
primary	Temp Mid Rang	24.72	24.74	0.0000	25.42	C	0.68
primary	Temp High Rang	47.16	47.19	0.0000	47.95	C	0.76

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	PET427	Martin Valvur	04/16/2018	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
0.35	0.79

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Fluke

Parameter Shelter Temperatur

Serial Number 3275143

Tfer Desc. RTD

Tfer ID 01229

Slope 0.99986

Intercept -0.01977

Cert Date 1/24/2018

CorrCoff 1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.48	25.50	0.000	24.7	C	-0.79
primary	Temp Mid Range	25.59	25.61	0.000	25.7	C	0.04
primary	Temp Mid Range	27.09	27.11	0.000	27.3	C	0.22

Sensor Component System Memo

Condition

Status pass

Infrastructure Data For

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/16/2018

Shelter Make	**Shelter Model**	**Shelter Size**
Ekto	8814	896 cuft

Sensor Component	Sample Tower Type	**Condition**	Type B	**Status**	pass
Sensor Component	Conduit	**Condition**	Good	**Status**	pass
Sensor Component	Met Tower	**Condition**	Good	**Status**	pass
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	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:** SiteOpsProcComm

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

2 **Parameter:** DasComments

The heating and air conditioning systems run simultaneously. The towers are not grounded.

3 **Parameter:** DocumentationCo

The most recent calibration and maintenance report is not available onsite.

4 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form F-02058-1500-S1-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/16/2018

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

	Present	
Fire Extinguisher	☑	Inspected March 2018
First Aid Kit	☐	
Safety Glasses	☐	
Safety Hard Hat	☐	
Climbing Belt	☐	
Security Fence	☐	
Secure Shelter	☑	
Stable Entry Step	☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8814 **Shelter Size** 896 cuft

Shelter Clean ☑ **Notes** The shelter is dusty, but in good condition, well organized and maintained.

Site OK ☑ **Notes**

Driving Directions From I-40 take exit 311 to the Petrified Forest . The site operator's office is located in the visitors center. The site is another 25 miles further south on the park road near the Rainbow Forest at the south end of the park, 1.5 miles west of the main road on a closed side road. The gate at the side road is usually open. The park ranger horse stable is located past the site on the side road.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/16/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/16/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/16/2018

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/16/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 8 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/16/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☐
10	Is the sample tower stable and grounded?	☑	☐

11 Tower comments?

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

The heating and air conditioning systems run simultaneously. The towers are not grounded.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/16/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A
Wind speed sensor	☐	☐	☑
Wind direction sensor	☐	☐	☑
Temperature sensor	☐	☑	☐
Relative humidity sensor	☐	☐	☑
Solar radiation sensor	☐	☐	☑
Surface wetness sensor	☐	☐	☑
Wind sensor translator	☐	☐	☑
Temperature translator	☐	☐	☑
Humidity sensor translator	☐	☐	☑
Solar radiation translator	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑
Ozone analyzer	☑	☐	☐
Filter pack flow controller	☐	☑	☐
Filter pack MFC power supply	☐	☑	☐

	Yes	No	N/A
Data logger	☑	☐	☐
Data logger	☐	☐	☑
Strip chart recorder	☐	☐	☑
Computer	☐	☑	☐
Modem	☐	☑	☐
Printer	☑	☐	☐
Zero air pump	☑	☐	☐
Filter flow pump	☐	☑	☐
Surge protector	☐	☐	☑
UPS	☐	☐	☑
Lightning protection device	☐	☐	☑
Shelter heater	☐	☑	☐
Shelter air conditioner	☑	☐	☐

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

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2015	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑	Not current	☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	Flow & observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☑	Control charts not used

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

The most recent calibration and maintenance report is not available onsite.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/16/2018

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Every 4 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Every 4 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Semiannually	☑

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/16/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed various times
2	Are the Site Status Report Forms being completed and filed correctly?	☑	No observations
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☐	
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☐	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	second day
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

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

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID PET427 **Technician** Martin Valvur **Site Visit Date** 04/16/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906TB	none
DAS	Environmental Sys Corp	8816	2526	90641
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	071100039615	none
Flow Rate	Alicat	MC-10SLPM-D-PC	150339	none
Infrastructure	Infrastructure	none	none	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460048	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1211052489	none
Sample Tower	Aluma Tower	B	none	none
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	029201	none
Zero air pump	Werther International	PC 70/4	531382	none

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number

GRC474-Martin Valvur-04/17/2018

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
1	4/17/2018	Computer	Hewlett Packard	none	6560 b	5CB22906T9
2	4/17/2018	DAS	Environmental Sys Corp	90602	8816	2270
3	4/17/2018	Elevation	Elevation	None	1	None
4	4/17/2018	Filter pack flow pump	Thomas	none	107CAB110	109500000031
5	4/17/2018	flow rate	Tylan	none	FC280SAV	AW9805027
6	4/17/2018	Infrastructure	Infrastructure	none	none	none
7	4/17/2018	MFC power supply	Tylan	none	RO-32	illegible
8	4/17/2018	Modem	Sierra wireless	none	GX450	LA54620247001003
9	4/17/2018	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943902
10	4/17/2018	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1130450191
11	4/17/2018	Printer	Hewlett Packard	none	842C	unknown
12	4/17/2018	Sample Tower	Aluma Tower	03570	B	none
13	4/17/2018	Shelter Temperature	ARS	none	none	none
14	4/17/2018	Siting Criteria	Siting Criteria	None	1	None
15	4/17/2018	Temperature2meter	RM Young	none	41342VC	17626
16	4/17/2018	Zero air pump	Werther International	none	PC70/4	531380

DAS Data Form

DAS Time Max Error: 1.37

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2270	GRC474	Martin Valvur	04/17/2018	DAS	Primary

Das Date: 4 /17/2018
Das Time: 10:44:23
Das Day: 107

Audit Date 4 /17/2018
Audit Time 10:45:45
Audit Day 107

Low Channel:

Avg Diff: 0.0003
Max Diff: 0.0006

High Channel:

Avg Diff: 0.0003
Max Diff: 0.0006

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

Mfg Fluke
Parameter DAS
Serial Number 95740243
Tfer Desc. DVM
Tfer ID 01312
Slope 1.00000
Intercept 0.00000
Cert Date 2/14/2018
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
13	0.0000	-0.0003	-0.0003	V	V	0.0000
13	0.1000	0.0997	0.0997	V	V	0.0000
13	0.3000	0.2994	0.2993	V	V	-0.0001
13	0.5000	0.4972	0.4975	V	V	0.0003
13	0.7000	0.6994	0.6999	V	V	0.0005
13	0.9000	0.8992	0.8997	V	V	0.0005
13	1.0000	0.9990	0.9996	V	V	0.0006

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9805027	GRC474	Martin Valvur	04/17/2018	flow rate	none

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

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	0.98450	**Intercept**	0.10300
Cert Date	3/1/2018	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.44%	1.55%		

Cal Factor Zero 0.124

Cal Factor Full Scale 5.567

Rotometer Reading: 3.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.18	0.0000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.18	0.0000	-0.02	l/m	l/m	
primary	test pt 1	3.027	2.970	2.67	0.0000	3.02	l/m	l/m	1.55%
primary	test pt 2	3.037	2.980	2.67	0.0000	3.02	l/m	l/m	1.21%
primary	test pt 3	3.030	2.970	2.67	0.0000	3.02	l/m	l/m	1.55%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	225 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1023943902	GRC474	Martin Valvur	04/17/2018	Ozone	none

Slope:	0.99403	**Slope:**	0.00000
Intercept	-0.42301	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
2.1%	3.3%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00801	**Intercept**	-0.05199
Cert Date	9/11/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.12	0.17	0.11	ppb	
primary	2	14.98	14.91	14.42	ppb	-3.29%
primary	3	36.98	36.73	35.94	ppb	-2.15%
primary	4	67.85	67.36	65.85	ppb	-2.24%
primary	5	115.43	114.56	113.90	ppb	-0.58%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	-0.1	**Status**	pass
Sensor Component	Span	**Condition**	1.013	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0002	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.0003	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	83.6 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.69 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	591.8 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	29.5 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	75.5 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.69 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	591.5 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	17626	GRC474	Martin Valvur	04/17/2018	Temperature2meter	none

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99986	**Intercept**	-0.01977
Cert Date	1/24/2018	**CorrCoff**	1.00000

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

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.04	0.06	0.0000	0.19	C	0.13
primary	Temp Mid Rang	25.19	25.21	0.0000	25.32	C	0.11
primary	Temp High Rang	47.57	47.60	0.0000	47.62	C	0.02

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	GRC474	Martin Valvur	04/17/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.76	0.95		

Mfg	Fluke	**Parameter**	Shelter Temperatur
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99986	**Intercept**	-0.01977
Cert Date	1/24/2018	**CorrCoff**	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	18.60	18.62	0.000	19.1	C	0.44
primary	Temp Mid Range	18.07	18.09	0.000	19.0	C	0.89
primary	Temp Mid Range	20.36	20.38	0.000	21.3	C	0.95

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

Infrastructure Data For

Site ID GRC474

Technician Martin Valvur

Site Visit Date 04/17/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component	Sample Tower Type	**Condition**	Type B	**Status**	pass
Sensor Component	Conduit	**Condition**	Good	**Status**	pass
Sensor Component	Met Tower	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Trap	**Condition**	Not 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	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:** SiteOpsProcedures

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

2 **Parameter:** ShelterCleanNotes

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

3 **Parameter:** MetOpMaintCom

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/17/2018

Site Sponsor (agency)	NPS/EPA	**USGS Map**		Grand Canyon
Operating Group	NPS	**Map Scale**		
AQS #	04-005-8001	**Map Date**		
Meteorological Type	R.M. Young			
Air Pollutant Analyzer	Ozone, UV-B	**QAPP Latitude**		
Deposition Measurement	dry, wet, IMPROVE	**QAPP Longitude**		
Land Use	woodland - evergreen	**QAPP Elevation Meters**		
Terrain	complex	**QAPP Declination**		
Conforms to MLM	No	**QAPP Declination Date**		
Site Telephone	(928) 638-2031	**Audit Latitude**		36.058642
Site Address 1	2D Albright Ave	**Audit Longitude**		-112.183575
Site Address 2	PO Box 129	**Audit Elevation**		2070
County	Coconino	**Audit Declination**		11.5
City, State	Grand Canyon, AZ		**Present**	
Zip Code	86023	**Fire Extinguisher**	☑	No inspection date
Time Zone	Arizona	**First Aid Kit**	☑	
Primary Operator		**Safety Glasses**	☐	
Primary Op. Phone #		**Safety Hard Hat**	☐	
Primary Op. E-mail		**Climbing Belt**	☐	
Backup Operator		**Security Fence**	☐	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is in fair condition, clean, neat, and well organized. Some floor tiles are missing and broken.

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/17/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form F-02058-1500-S3-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/17/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	Above shelter
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/17/2018

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

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

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

Field Systems Data Form F-02058-1500-S5-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/17/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/17/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☐

11 Tower comments? Sample tower not grounded but bolted to the shelter

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/17/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A
Wind speed sensor	☐	☐	☑
Wind direction sensor	☐	☐	☑
Temperature sensor	☐	☑	☐
Relative humidity sensor	☐	☐	☑
Solar radiation sensor	☐	☐	☑
Surface wetness sensor	☐	☐	☑
Wind sensor translator	☐	☐	☑
Temperature translator	☐	☐	☑
Humidity sensor translator	☐	☐	☑
Solar radiation translator	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑
Ozone analyzer	☐	☑	☐
Filter pack flow controller	☐	☑	☐
Filter pack MFC power supply	☐	☑	☐

	Yes	No	N/A
Data logger	☐	☑	☐
Data logger	☐	☐	☑
Strip chart recorder	☐	☐	☑
Computer	☐	☑	☐
Modem	☐	☑	☐
Printer	☐	☑	☐
Zero air pump	☐	☑	☐
Filter flow pump	☐	☑	☐
Surge protector	☐	☑	☐
UPS	☐	☑	☐
Lightning protection device	☐	☑	☐
Shelter heater	☐	☑	☐
Shelter air conditioner	☑	☐	☐

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

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2015	☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑	Not current	☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	Flow & observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form F-02058-1500-S8-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/17/2018

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Every 3 or 4 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Every 3 or 4 weeks	☑
In-line Filter Replacement (at analyze	☐	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

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

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

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

Field Systems Data Form **F-02058-1500-S9-rev002**

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/17/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings 95% of the time
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Not present	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑

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

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID GRC474 **Technician** Martin Valvur **Site Visit Date** 04/17/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6560 b	5CB22906T9	none
DAS	Environmental Sys Corp	8816	2270	90602
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB110	109500000031	none
flow rate	Tylan	FC280SAV	AW9805027	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	illegible	none
Modem	Sierra wireless	GX450	LA54620247001003	none
Ozone	ThermoElectron Inc	49i A3NAA	1023943902	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1130450191	none
Printer	Hewlett Packard	842C	unknown	none
Sample Tower	Aluma Tower	B	none	03570
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342VC	17626	none
Zero air pump	Werther International	PC70/4	531380	none

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
CHA467-Martin Valvur-04/19/2018						
1	4/19/2018	Computer	Hewlett Packard	none	65606	5CB22906V1
2	4/19/2018	DAS	Environmental Sys Corp	90611	8816	2613
3	4/19/2018	Elevation	Elevation	None	1	None
4	4/19/2018	Filter pack flow pump	Thomas	none	107CAB18	051600053774
5	4/19/2018	flow rate	Tylan	none	FC280SAV	AW9706014
6	4/19/2018	Infrastructure	Infrastructure	none	none	none
7	4/19/2018	MFC power supply	Tylan	none	RO-32	FP99706005
8	4/19/2018	Modem	US Robotics	09615	56k	unknown
9	4/19/2018	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460007
10	4/19/2018	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460051
11	4/19/2018	Sample Tower	Aluma Tower	03566	A	none
12	4/19/2018	Shelter Temperature	ARS	none	none	none
13	4/19/2018	Siting Criteria	Siting Criteria	None	1	None
14	4/19/2018	Temperature2meter	RM Young	none	41342	018535
15	4/19/2018	Zero air pump	Werther International	none	PC70/4	000665785

DAS Data Form

DAS Time Max Error: 0.25

Mfg	**Serial Number**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Use Desc.**
Environmental Sys	2613	CHA467	Martin Valvur	04/19/2018	DAS	Primary

Das Date: 4 /19/2018
Das Time: 9:53:00
Das Day: 109

Audit Date 4 /19/2018
Audit Time 9:52:45
Audit Day 109

Low Channel:

Avg Diff:	**Max Diff:**
0.0003	0.0004

High Channel:

Avg Diff:	**Max Diff:**
0.0003	0.0004

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

Mfg Fluke
Parameter DAS
Serial Number 95740243
Tfer Desc. DVM
Tfer ID 01312
Slope 1.00000
Intercept 0.00000
Cert Date 2/14/2018
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
13	0.0000	-0.0008	-0.0005	V	V	0.0003
13	0.1000	0.0999	0.1000	V	V	0.0001
13	0.3000	0.2997	0.2997	V	V	0.0000
13	0.5000	0.4987	0.4991	V	V	0.0004
13	0.7000	0.6996	0.7000	V	V	0.0004
13	0.9000	0.8993	0.8996	V	V	0.0003
13	1.0000	0.9997	1.0000	V	V	0.0003

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9706014	CHA467	Martin Valvur	04/19/2018	flow rate	none

Mfg Tylan

SN/Owner ID FP99706005 none

Parameter MFC power supply

Mfg BIOS

Parameter Flow Rate

Serial Number 148613

Tfer Desc. BIOS 220-H

Tfer ID 01421

Slope 0.98450

Intercept 0.10300

Cert Date 3/1/2018

CorrCoff 1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
0.49%	0.87%		

Cal Factor Zero 0.433

Cal Factor Full Scale 5.818

Rotometer Reading: 3.3

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.40	0.0000	0.04	l/m	l/m	
primary	leak check	0.000	0.000	-0.40	0.0000	0.04	l/m	l/m	
primary	test pt 1	3.058	3.000	2.40	0.0000	3.03	l/m	l/m	0.87%
primary	test pt 2	3.073	3.020	2.40	0.0000	3.02	l/m	l/m	0.10%
primary	test pt 3	3.071	3.010	2.40	0.0000	3.03	l/m	l/m	0.50%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	6.3 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.3 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460007	CHA467	Martin Valvur	04/19/2018	Ozone	none

Slope: 0.98088
Intercept -0.96843
CorrCoff 0.99997

Slope: 0.00000
Intercept 0.00000
CorrCoff 0.00000

DAS 1:

A Avg % Diff:	A Max % Di
4.9%	7.7%

DAS 2:

A Avg %Dif	A Max % Di

Mfg ThermoElectron Inc
Parameter ozone
Serial Number 49CPS-70008-364
Tfer Desc. Ozone primary stan
Tfer ID 01110
Slope 1.00801
Intercept -0.05199
Cert Date 9/11/2017
CorrCoff 1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.19	0.24	-0.43	ppb	
primary	2	14.69	14.62	13.49	ppb	-7.73%
primary	3	36.31	36.07	34.06	ppb	-5.57%
primary	4	67.67	67.18	64.54	ppb	-3.93%
primary	5	116.95	116.07	113.20	ppb	-2.47%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Not tested	pass
Battery Backup	N/A	pass
Offset	0.4	pass
Span	1.021	pass
Zero Voltage	-0.0002	pass
Fullscale Voltage	0.9997	pass
Cell A Freq.	94.5 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	627.5 mmHg	pass
Cell A Tmp.	33.0 C	pass
Cell B Freq.	95.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	627.2 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	018535	CHA467	Martin Valvur	04/19/2018	Temperature2meter	none

Mfg Fluke **Parameter** Temperature

Serial Number 3275143 **Tfer Desc.** RTD

Tfer ID 01229

Slope 0.99986 **Intercept** -0.01977

Cert Date 1/24/2018 **CorrCoff** 1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.39	0.44		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.07	0.09	0.0000	0.39	C	0.3
primary	Temp Mid Rang	24.59	24.61	0.0000	25.05	C	0.44
primary	Temp High Rang	46.46	46.49	0.0000	46.92	C	0.43

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CHA467	Martin Valvur	04/19/2018	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
0.50	0.99

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Fluke

Parameter Shelter Temperatur

Serial Number 3275143

Tfer Desc. RTD

Tfer ID 01229

Slope 0.99986

Intercept -0.01977

Cert Date 1/24/2018

CorrCoff 1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.80	22.82	0.000	23.8	C	0.99
primary	Temp Mid Range	24.46	24.48	0.000	24.8	C	0.3
primary	Temp Mid Range	24.89	24.91	0.000	25.1	C	0.2

Sensor Component System Memo

Condition

Status pass

Infrastructure Data For

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2018

Shelter Make	**Shelter Model**	**Shelter Size**
Ekto	8810	640 cuft

Sensor Component	Sample Tower Type	**Condition**	Type B	**Status**	pass
Sensor Component	Conduit	**Condition**	Good	**Status**	pass
Sensor Component	Met Tower	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Trap	**Condition**	Not installed	**Status**	pass
Sensor Component	Power Cables	**Condition**	Fair	**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	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

The site operator routinely reviews the previous week's data.

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** MetSensorComme

The temperature sensor is mounted on the south side of the meteorological tower.

5 **Parameter:** MetOpMaintCom

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2018

Site Sponsor (agency)	NPS/EPA	**USGS Map**		Bowie Mountain South
Operating Group	NPS	**Map Scale**		
AQS #	04-003-8001	**Map Date**		
Meteorological Type	R.M. Young			
Air Pollutant Analyzer	Ozone, neph, IMPROVE	**QAPP Latitude**		
Deposition Measurement	dry, wet	**QAPP Longitude**		
Land Use	desert range, woodland - mixed	**QAPP Elevation Meters**		
Terrain	complex	**QAPP Declination**		
Conforms to MLM	No	**QAPP Declination Date**		
Site Telephone	(520) 824-4182	**Audit Latitude**		32.009405
Site Address 1	13063 East Bontia Canyon Road	**Audit Longitude**		-109.389058
Site Address 2		**Audit Elevation**		1569
County	Cochise	**Audit Declination**		9.6
City, State	Wilcox, AZ		**Present**	
Zip Code	85632	**Fire Extinguisher**	☑	Inspected Dec 2017
Time Zone	Mountain	**First Aid Kit**	☑	
Primary Operator		**Safety Glasses**	☐	
Primary Op. Phone #		**Safety Hard Hat**	☐	
Primary Op. E-mail		**Climbing Belt**	☑	
Backup Operator		**Security Fence**	☐	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is in good condition, clean, well organized, and well maintained.

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☐	South
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

The temperature sensor is mounted on the south side of the meteorological tower.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2018

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

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID CHA467

Technician Martin Valvur

Site Visit Date 04/19/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 15 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☐
10	Is the sample tower stable and grounded?	☑	☐

11 Tower comments? towers bolted to shelter

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A
Wind speed sensor	☐	☐	☑
Wind direction sensor	☐	☐	☑
Temperature sensor	☐	☑	☐
Relative humidity sensor	☐	☐	☑
Solar radiation sensor	☐	☐	☑
Surface wetness sensor	☐	☐	☑
Wind sensor translator	☐	☐	☑
Temperature translator	☐	☐	☑
Humidity sensor translator	☐	☐	☑
Solar radiation translator	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑
Ozone analyzer	☐	☑	☐
Filter pack flow controller	☐	☑	☐
Filter pack MFC power supply	☐	☑	☐

	Yes	No	N/A
Data logger	☑	☐	☐
Data logger	☐	☐	☑
Strip chart recorder	☐	☐	☑
Computer	☑	☐	☐
Modem	☐	☑	☐
Printer	☐	☐	☑
Zero air pump	☐	☑	☐
Filter flow pump	☐	☑	☐
Surge protector	☐	☐	☑
UPS	☐	☐	☑
Lightning protection device	☐	☐	☑
Shelter heater	☐	☑	☐
Shelter air conditioner	☑	☐	☐

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

	Present		Current
Station Log	☑	Dataview	☑
SSRF	☑		☑
Site Ops Manual	☑		☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑	Not current	☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	Dataview
2	Are the Site Status Report Forms being completed and current?	☑	Flow & observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2018

Site operation procedures

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

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

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

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

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

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

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

The site operator routinely reviews the previous week's data.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	Dataview and SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID CHA467 **Technician** Martin Valvur **Site Visit Date** 04/19/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	65606	5CB22906V1	none
DAS	Environmental Sys Corp	8816	2613	90611
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	051600053774	none
flow rate	Tylan	FC280SAV	AW9706014	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP99706005	none
Modem	US Robotics	56k	unknown	09615
Ozone	ThermoElectron Inc	49i A3NAA	CM08460007	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	CM08460051	none
Sample Tower	Aluma Tower	A	none	03566
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	018535	none
Zero air pump	Werther International	PC70/4	000665785	none

Site Inventory by Site Visit

Site Visit	Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GAS153-Sandy Grenville-05/10/2018						
1	5/10/2018	Computer	Dell	07019	Inspiron 15	GK2MC12
2	5/10/2018	DAS	Campbell	000635	CR3000	4934
3	5/10/2018	Elevation	Elevation	None	1	None
4	5/10/2018	Filter pack flow pump	Thomas	04858	107CAB18	608102A
5	5/10/2018	Flow Rate	Apex	000643	AXMC105LPMDPCV	illegible
6	5/10/2018	Infrastructure	Infrastructure	none	none	none
7	5/10/2018	Modem	Raven	06805	H4222-C	0934411884
8	5/10/2018	Ozone	ThermoElectron Inc	000705	49i A1NAA	1030244807
9	5/10/2018	Ozone Standard	ThermoElectron Inc	000371	49i A3NAA	0726124692
10	5/10/2018	Sample Tower	Aluma Tower	000138	B	none
11	5/10/2018	Shelter Temperature	Campbell	none	107-L	none
12	5/10/2018	Siting Criteria	Siting Criteria	None	1	None
13	5/10/2018	Temperature	RM Young	04319	41342	4038
14	5/10/2018	UPS	APC	missing	BP6505	NB0009260535
15	5/10/2018	Zero air pump	Werther International	06865	C 70/4	000814277

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	4934	GAS153	Sandy Grenville	05/10/2018	DAS	Primary

Das Date: 5 /10/2018
Das Time: 14:27:42
Das Day: 130

Audit Date 5 /10/2018
Audit Time 14:27:42
Audit Day 130

Low Channel:

Avg Diff: 0.0001
Max Diff: 0.0003

High Channel:

Avg Diff: 0.0001
Max Diff: 0.0003

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

Mfg Fluke
Parameter DAS
Serial Number 95740135
Tfer Desc. DVM
Tfer ID 01311
Slope 1.00000
Intercept 0.00000
Cert Date 2/13/2018
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0003	V	V	0.0003
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6995	0.6995	V	V	0.0000
7	0.9000	0.8994	0.8994	V	V	0.0000
7	1.0000	0.9992	0.9992	V	V	0.0000

Flow Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Apex	illegible	GAS153	Sandy Grenville	05/10/2018	Flow Rate	000643

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 220-H
Tfer ID	01414		
Slope	1.00055	**Intercept**	-0.01570
Cert Date	2/21/2018	**CorrCoff**	1.00000

DAS 1:

DAS 2:

A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.02%	3.23%		

Cal Factor Zero -0.02

Cal Factor Full Scale 1

Rotometer Reading: 1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.01	0.000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.02	l/m	l/m	
primary	test pt 1	1.533	1.550	1.50	0.000	1.50	l/m	l/m	-3.23%
primary	test pt 2	1.531	1.550	1.49	0.000	1.50	l/m	l/m	-3.23%
primary	test pt 3	1.530	1.540	1.49	0.000	1.50	l/m	l/m	-2.60%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	1.6 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.7 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	190 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
ThermoElectron Inc	1030244807	GAS153	Sandy Grenville	05/10/2018	Ozone	000705

Slope:	0.93379	**Slope:**	0.00000
Intercept	-1.32697	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
11.2%	17.0%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00504	**Intercept**	0.32915
Cert Date	9/12/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.00	-0.32	-1.25	ppb	
primary	2	14.90	14.49	12.03	ppb	-16.98%
primary	3	35.00	34.49	30.40	ppb	-11.86%
primary	4	68.00	67.33	61.81	ppb	-8.20%
primary	5	109.70	108.82	100.30	ppb	-7.83%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	Not functioning	**Status**	Fail
Sensor Component	Offset	**Condition**	0.70	**Status**	pass
Sensor Component	Span	**Condition**	1.038	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	109.7 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.7 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.19 lpm	**Status**	Fail
Sensor Component	Cell A Pressure	**Condition**	734.9 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	37.3 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	97.6 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.7 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.21 lpm	**Status**	Fail
Sensor Component	Cell B Pressure	**Condition**	734.6 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	about 2%	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4038	GAS153	Sandy Grenville	05/10/2018	Temperature	04319

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00798	**Intercept**	0.09168
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.03	0.04		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.19	0.10	0.000	0.1	C	-0.04
primary	Temp Mid Range	25.36	25.07	0.000	25.1	C	0.02
primary	Temp High Range	48.30	47.83	0.000	47.8	C	-0.04

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	GAS153	Sandy Grenville	05/10/2018	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
0.55	1.08

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232734

Tfer Desc. RTD

Tfer ID 01227

Slope 1.00798

Intercept 0.09168

Cert Date 2/13/2018

CorrCoff 1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.11	24.82	0.000	25.4	C	0.53
primary	Temp Mid Range	28.18	27.87	0.000	27.8	C	-0.03
primary	Temp Mid Range	23.92	23.64	0.000	24.7	C	1.08

Sensor Component System Memo

Condition

Status pass

Infrastructure Data For

Site ID GAS153 **Technician** Sandy Grenville **Site Visit Date** 05/10/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component	Sample Tower Type	**Condition**	Type B	**Status**	pass
Sensor Component	Conduit	**Condition**	N/A	**Status**	pass
Sensor Component	Met Tower	**Condition**	N/A	**Status**	pass
Sensor Component	Moisture Trap	**Condition**	Installed	**Status**	pass
Sensor Component	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	Signal Cable	**Condition**	Good	**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.	Hazard	Problem
Ozone	GAS153	Sandy Grenville	05/10/2018	Cell B Flow	ThermoElectron	3480	☐	☐
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Ozone	GAS153	Sandy Grenville	05/10/2018	Cell A Flow	ThermoElectron	3480	☐	☐
This analyzer diagnostic check is outside the manufacturer's recommended value.								

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	GAS153	**Technician**	Sandy Grenville	**Site Visit Date**	05/10/2018

Site Sponsor (agency)	EPA	**USGS Map**	Hollonville
Operating Group	UGA	**Map Scale**	
AQS #	13-231-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	
Terrain	gently rolling	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
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

			Present	
City, State	Williamson, GA			
Zip Code	30292	**Fire Extinguisher**	☑	New in 2015
Time Zone	Eastern	**First Aid Kit**	☑	
Primary Operator		**Safety Glasses**	☐	
Primary Op. Phone #		**Safety Hard Hat**	☑	
Primary Op. E-mail		**Climbing Belt**	☐	
Backup Operator		**Security Fence**	☐	
Backup Op. Phone #		**Secure Shelter**	☐	Not locked
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**					
Site OK	☑	**Notes**					

Driving Directions From I-75 take exit 205 (Rt 16) west to Griffin. Continue west through Griffin to 19/41 south. Turn south on 19/41 and take the next exit (Rt 362) west toward Williamson. Continue 7.2 miles on 362 through Williamson. Bear right on the dirt road marked Blanton Mill Road, approximately 0.9 miles to the gated Bledsoe Farm on the right. The site is past the farm office and sheds on the north side of the farm.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID GAS153 **Technician** Sandy Grenville **Site Visit Date** 05/10/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form F-02058-1500-S3-rev002

Site ID GAS153 **Technician** Sandy Grenville **Site Visit Date** 05/10/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID GAS153 **Technician** Sandy Grenville **Site Visit Date** 05/10/2018

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID GAS153

Technician Sandy Grenville

Site Visit Date 05/10/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	Moisture in tubing only
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID GAS153

Technician Sandy Grenville

Site Visit Date 05/10/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑

11	Tower comments?	Met tower removed

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID GAS153 **Technician** Sandy Grenville **Site Visit Date** 05/10/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☐		☐
HASP	☑	Oct 2011	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form F-02058-1500-S8-rev002

Site ID GAS153 **Technician** Sandy Grenville **Site Visit Date** 05/10/2018

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	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?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	Call-in only

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID GAS153

Technician Sandy Grenville

Site Visit Date 05/10/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, call-in
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID GAS153 **Technician** Sandy Grenville **Site Visit Date** 05/10/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	GK2MC12	07019
DAS	Campbell	CR3000	4934	000635
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	608102A	04858
Flow Rate	Apex	AXMC105LPMDPC	illegible	000643
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0934411884	06805
Ozone	ThermoElectron Inc	49i A1NAA	1030244807	000705
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124692	000371
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

SND152-Sandy Grenville-05/11/2018

	Site Visit Date	***Parameter***	***Mfg***	***Owner ID***	***Model Number***	***Serial Number***
1	5/11/2018	Computer	Dell	07047	Inspiron 15	BY3MC12
2	5/11/2018	DAS	Campbell	000357	CR3000	2135
3	5/11/2018	Elevation	Elevation	None	1	None
4	5/11/2018	Filter pack flow pump	Thomas	04855	107CAB18	060300020200
5	5/11/2018	Flow Rate	Apex	000856	AXMC105LPMDPCV	illegible
6	5/11/2018	Infrastructure	Infrastructure	none	none	none
7	5/11/2018	Modem	Raven	06458	V4221-V	0808337422
8	5/11/2018	Ozone	ThermoElectron Inc	000725	49i A1NAA	1105347328
9	5/11/2018	Ozone Standard	ThermoElectron Inc	000704	49i A3NAA	1030244816
10	5/11/2018	Sample Tower	Aluma Tower	000148	B	none
11	5/11/2018	Shelter Temperature	Campbell	none	107-L	none
12	5/11/2018	Siting Criteria	Siting Criteria	None	1	None
13	5/11/2018	Temperature	RM Young	06405	41342	14038
14	5/11/2018	Zero air pump	Werther International	06900	PC70/4	000821894

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2135	SND152	Sandy Grenville	05/11/2018	DAS	Primary

Das Date: 5 /11/2018
Das Time: 11:16:46
Das Day: 131

Audit Date 5 /11/2018
Audit Time 11:16:46
Audit Day 131

Low Channel:

High Channel:

Low Channel Avg Diff:	Low Channel Max Diff:	High Channel Avg Diff:	High Channel Max Diff:
0.0000	0.0001	0.0000	0.0001

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

Mfg Fluke
Parameter DAS
Serial Number 95740135
Tfer Desc. DVM
Tfer ID 01311
Slope 1.00000
Intercept 0.00000
Cert Date 2/13/2018
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2998	0.2998	V	V	0.0000
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6995	0.6995	V	V	0.0000
7	0.9000	0.8994	0.8994	V	V	0.0000
7	1.0000	0.9992	0.9993	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	SND152	Sandy Grenville	05/11/2018	Flow Rate	000856

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 220-H
Tfer ID	01414		
Slope	1.00055	**Intercept**	-0.01570
Cert Date	2/21/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.32%	1.32%		

Cal Factor Zero -0.05

Cal Factor Full Scale 0.95

Rotometer Reading: 1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.04	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	-0.04	l/m	l/m	
primary	test pt 1	1.506	1.520	1.55	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.506	1.520	1.55	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.505	1.520	1.55	0.000	1.50	l/m	l/m	-1.32%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.7 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	200 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
ThermoElectron Inc	1105347328	SND152	Sandy Grenville	05/11/2018	Ozone	000725

Slope:	0.99526	**Slope:**	0.00000
Intercept	-0.53683	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.3%	4.8%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00504	**Intercept**	0.32915
Cert Date	9/12/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.05	-0.27	-0.68	ppb	
primary	2	15.10	14.69	13.98	ppb	-4.83%
primary	3	34.90	34.39	33.77	ppb	-1.80%
primary	4	67.70	67.03	65.94	ppb	-1.63%
primary	5	110.00	109.12	108.20	ppb	-0.84%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.6	**Status**	pass
Sensor Component	Span	**Condition**	1.013	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	104.3 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.61 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	694.4 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	34.9 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	92.2 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.69 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	694.4 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14038	SND152	Sandy Grenville	05/11/2018	Temperature	06405

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00798	**Intercept**	0.09168
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.04	0.06		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.16	0.07	0.000	0.0	C	-0.04
primary	Temp Mid Range	25.60	25.31	0.000	25.3	C	-0.06
primary	Temp High Range	48.91	48.43	0.000	48.4	C	-0.01

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	SND152	Sandy Grenville	05/11/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.62	0.77		

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232734

Tfer Desc. RTD

Tfer ID 01227

Slope 1.00798

Intercept 0.09168

Cert Date 2/13/2018

CorrCoff 1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.30	25.01	0.000	25.7	C	0.73
primary	Temp Mid Range	24.18	23.90	0.000	24.3	C	0.36
primary	Temp Mid Range	29.69	29.36	0.000	28.6	C	-0.77

Sensor Component System Memo

Condition

Status pass

Infrastructure Data For

Site ID SND152 **Technician** Sandy Grenville **Site Visit Date** 05/11/2018

Shelter Make	**Shelter Model**	**Shelter Size**
Ekto	8810	640 cuft

Sensor Component	Sample Tower Type	**Condition**	Type B	**Status**	pass
Sensor Component	Conduit	**Condition**	N/A	**Status**	pass
Sensor Component	Met Tower	**Condition**	N/A	**Status**	pass
Sensor Component	Moisture Trap	**Condition**	Installed	**Status**	pass
Sensor Component	Power Cables	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Temp Control	**Condition**	Functioning	**Status**	pass
Sensor Component	Rotometer	**Condition**	Installed	**Status**	pass
Sensor Component	Sample Tower	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Condition	**Condition**	Fair	**Status**	pass
Sensor Component	Shelter Door	**Condition**	Fair	**Status**	pass
Sensor Component	Shelter Roof	**Condition**	Fair	**Status**	pass
Sensor Component	Shelter Floor	**Condition**	Fair	**Status**	pass
Sensor Component	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:** DasComments

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

2 **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.

3 **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.

4 **Parameter:** ShelterCleanNotes

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

5 **Parameter:** MetSensorComme

The temperature sensor is mounted to the sample tower and is oriented to the west. The shield has faded to gray in color and is no longer white which may affect the reflectivity.

6 **Parameter:** MetOpMaintCom

The temperature sensor signal cable is now in poor condition with several sections of tape and many kinks.

Field Systems Data Form F-02058-1500-S1-rev002

Site ID SND152 **Technician** Sandy Grenville **Site Visit Date** 05/11/2018

Site Sponsor (agency)	EPA	**USGS Map**		Crossville
Operating Group	Auburn Univ./private	**Map Scale**		
AQS #	01-049-9991	**Map Date**		
Meteorological Type	R.M. Young			
Air Pollutant Analyzer	Ozone, PM10	**QAPP Latitude**		
Deposition Measurement	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**	☐	
Backup Operator		**Security Fence**	☑	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is kept clean, neat, and very well organized. The shelter floor has deteriorated since the previous audit with areas of extreme rot just inside the door and along the north wall.

Site OK ☑ **Notes**

Driving Directions From I-59 take exit 205, Highway 68, west toward Crossville. The site is on the right at the Sand Mountain Research and Extension Station just at the east edge of Crossville. The combination to the gate lock is 22-32-10.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID SND152 **Technician** Sandy Grenville **Site Visit Date** 05/11/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m	100 m	☐
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m	20 m	☐
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☐

Siting Criteria Comment

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.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID SND152

Technician Sandy Grenville

Site Visit Date 05/11/2018

1	**Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?**	☑	N/A
2	**Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)**	☑	N/A
3	**Are the tower and sensors plumb?**	☑	N/A
4	**Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?**	☐	Shield pointing west
5	**Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)**	☑	
6	**Is the solar radiation sensor plumb?**	☑	N/A
7	**Is it sited to avoid shading, or any artificial or reflected light?**	☑	N/A
8	**Is the rain gauge plumb?**	☑	N/A
9	**Is it sited to avoid sheltering effects from buildings, trees, towers, etc?**	☑	N/A
10	**Is the surface wetness sensor sited with the grid surface facing north?**	☑	N/A
11	**Is it inclined approximately 30 degrees?**	☑	N/A

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

The temperature sensor is mounted to the sample tower and is oriented to the west. The shield has faded to gray in color and is no longer white which may affect the reflectivity.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID SND152 **Technician** Sandy Grenville **Site Visit Date** 05/11/2018

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID SND152 **Technician** Sandy Grenville **Site Visit Date** 05/11/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID SND152

Technician Sandy Grenville

Site Visit Date 05/11/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑

11 Tower comments? Met tower removed

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID SND152 **Technician** Sandy Grenville **Site Visit Date** 05/11/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Feb 2014	☑
HASP	☑	Feb 2014	☑
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☑
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID SND152 **Technician** Sandy Grenville **Site Visit Date** 05/11/2018

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐		☑
Analyzer Diagnostics Tests	☐	Not performed	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☑	Weekly	☑
Zero Air Desiccant Check	☑	Weekly	☑

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID SND152 **Technician** Sandy Grenville **Site Visit Date** 05/11/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID SND152 **Technician** Sandy Grenville **Site Visit Date** 05/11/2018

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	060300020200	04855
Flow Rate	Apex	AXMC105LPMDPC	illegible	000856
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808337422	06458
Ozone	ThermoElectron Inc	49i A1NAA	1105347328	000725
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244816	000704
Sample Tower	Aluma Tower	B	none	000148
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14038	06405
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
ESP127-Sandy Grenville-05/12/2018						
1	5/12/2018	Computer	Dell	07060	Inspiron 15	894MC12
2	5/12/2018	DAS	Campbell	illegible	CR3000	3817
3	5/12/2018	Elevation	Elevation	None	1	None
4	5/12/2018	Filter pack flow pump	Thomas	02975	107CAB18	0493002476
5	5/12/2018	Flow Rate	Apex	000642	AXMC105LPMDPCV	54755
6	5/12/2018	Infrastructure	Infrastructure	none	none	none
7	5/12/2018	Modem	Raven	06606	H4223-C	0844355622
8	5/12/2018	Ozone	ThermoElectron Inc	000695	49i A1NAA	1030244801
9	5/12/2018	Ozone Standard	ThermoElectron Inc	000327	49i A3NAA	0622717852
10	5/12/2018	Sample Tower	Aluma Tower	03550	A	none
11	5/12/2018	Shelter Temperature	Campbell	none	107-L	none
12	5/12/2018	Siting Criteria	Siting Criteria	None	1	None
13	5/12/2018	Temperature	RM Young	06406	41342VC	14039
14	5/12/2018	Zero air pump	Werther International	06909	C 70/4	000829161

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	3817	ESP127	Sandy Grenville	05/12/2018	DAS	Primary

Das Date: 5 /12/2018
Das Time: 14:08:00
Das Day: 132

Audit Date 5 /12/2018
Audit Time 14:08:00
Audit Day 132

Low Channel:

Avg Diff:	**Max Diff:**
0.0001	0.0002

High Channel:

Avg Diff:	**Max Diff:**
0.0001	0.0002

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

Mfg Fluke
Parameter DAS
Serial Number 95740135
Tfer Desc. DVM
Tfer ID 01311
Slope 1.00000
Intercept 0.00000
Cert Date 2/13/2018
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6995	0.6995	V	V	0.0000
7	0.9000	0.8994	0.8992	V	V	-0.0002
7	1.0000	0.9993	0.9991	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54755	ESP127	Sandy Grenville	05/12/2018	Flow Rate	000642

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 220-H
Tfer ID	01414		
Slope	1.00055	**Intercept**	-0.01570
Cert Date	2/21/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.38%	2.60%		

Cal Factor Zero	0.02
Cal Factor Full Scale	1
Rotometer Reading:	1.4

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	test pt 1	1.528	1.540	1.51	0.000	1.50	l/m	l/m	-2.60%
primary	test pt 2	1.528	1.540	1.51	0.000	1.51	l/m	l/m	-1.95%
primary	test pt 3	1.530	1.540	1.51	0.000	1.50	l/m	l/m	-2.60%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.2 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-0.5 cm	**Status**	Fail
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass

Ozone Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
ThermoElectron Inc	1030244801	ESP127	Sandy Grenville	05/12/2018	Ozone	000695

Slope:	0.98976	**Slope:**	0.00000
Intercept	-0.44844	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.4%	3.5%		

Mfg ThermoElectron Inc

Parameter ozone

Serial Number 0517112167

Tfer Desc. Ozone primary stan

Tfer ID 01113

Slope 1.00504

Intercept 0.32915

Cert Date 9/12/2017

CorrCoff 1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	-0.31	-0.69	ppb	
primary	2	15.00	14.59	14.08	ppb	-3.50%
primary	3	34.80	34.29	33.40	ppb	-2.60%
primary	4	67.60	66.93	65.59	ppb	-2.00%
primary	5	109.80	108.92	107.50	ppb	-1.30%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.40	**Status**	pass
Sensor Component	Span	**Condition**	1.008	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	104.1 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.7 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.70 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	697.7 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	31.8 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	98.8 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.70 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	697.4 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14039	ESP127	Sandy Grenville	05/12/2018	Temperature	06406

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00798	**Intercept**	0.09168
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.34	0.63		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.19	0.10	0.000	0.4	C	0.3
primary	Temp Mid Range	25.79	25.49	0.000	25.4	C	-0.09
primary	Temp High Range	48.72	48.24	0.000	48.9	C	0.63

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	ESP127	Sandy Grenville	05/12/2018	Shelter Temperature	none

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

Mfg	Extech	**Parameter**	Shelter Temperatur
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00798	**Intercept**	0.09168
Cert Date	2/13/2018	**CorrCoff**	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.93	23.65	0.000	23.7	C	0.08
primary	Temp Mid Range	29.24	28.92	0.000	29.2	C	0.28
primary	Temp Mid Range	22.30	22.03	0.000	22.4	C	0.37

Sensor Component	Condition	Status
System Memo		pass

Infrastructure Data For

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 05/12/2018

Shelter Make	**Shelter Model**	**Shelter Size**
Ekto	8810	640 cuft

Sensor Component	Sample Tower Type	**Condition**	Type A	**Status**	pass
Sensor Component	Conduit	**Condition**	N/A	**Status**	pass
Sensor Component	Met Tower	**Condition**	N/A	**Status**	pass
Sensor Component	Moisture Trap	**Condition**	Installed	**Status**	pass
Sensor Component	Power Cables	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Temp Control	**Condition**	Functioning	**Status**	pass
Sensor Component	Rotometer	**Condition**	Installed	**Status**	pass
Sensor Component	Sample Tower	**Condition**	Fair	**Status**	pass
Sensor Component	Shelter Condition	**Condition**	Fair	**Status**	pass
Sensor Component	Shelter Door	**Condition**	Fair	**Status**	pass
Sensor Component	Shelter Roof	**Condition**	Fair	**Status**	pass
Sensor Component	Shelter Floor	**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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	ESP127	Sandy Grenville	05/12/2018	Filter Position	Apex	3540	☐	☐

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:** DasComments

The Shelter is dirty and cluttered with no trash can and dead beetles on the counter top. The heater and air conditioner are operating simultaneously.

2 **Parameter:** ShelterCleanNotes

The shelter has been improved since the previous audit, however there is still some rot in the walls.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 05/12/2018

Site Sponsor (agency)	EPA	**USGS Map**	Silver Point
Operating Group	private, TN DEC	**Map Scale**	
AQS #	47-041-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	rolling - complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(615) 597-6556	**Audit Latitude**	36.03893
Site Address 1	Craft Center Rd.	**Audit Longitude**	-85.73305
Site Address 2	Hurricane Bridge	**Audit Elevation**	302
County	DeKalb	**Audit Declination**	-3.5

			Present	
City, State	Smithville, TN			
Zip Code	37166	**Fire Extinguisher**	☑	New in 2015
Time Zone	Central	**First Aid Kit**	☑	
Primary Operator		**Safety Glasses**	☑	
Primary Op. Phone #		**Safety Hard Hat**	☑	
Primary Op. E-mail		**Climbing Belt**	☐	
Backup Operator		**Security Fence**	☑	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter has been improved since the previous audit, however there is still some rot in the walls.

Site OK ☑ **Notes**

Driving Directions From interstate 40 take exit 273, south on 56. Immediately after crossing the Hurricane Bridge over the Caney Fork River, turn left at the sign for Tennessee Tech and the Appalachian Center for Crafts. Continue about 1 mile to the locked (518) yellow gate on the right. The site is up the hill through the gate.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 05/12/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	30 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 05/12/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID ESP127

Technician Sandy Grenville

Site Visit Date 05/12/2018

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

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

Field Systems Data Form F-02058-1500-S5-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 05/12/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 05/12/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑

11 Tower comments?

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

The Shelter is dirty and cluttered with no trash can and dead beetles on the counter top. The heater and air conditioner are operating simultaneously.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 05/12/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☐
SSRF	☑		☑
Site Ops Manual	☑	Oct 2010	☐
HASP	☑	Nov 2010	☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	Minimal information
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form F-02058-1500-S8-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 05/12/2018

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 05/12/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, call-in
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID ESP127 **Technician** Sandy Grenville **Site Visit Date** 05/12/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	894MC12	07060
DAS	Campbell	CR3000	3817	illegible
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0493002476	02975
Flow Rate	Apex	AXMC105LPMDPC	54755	000642
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4223-C	0844355622	06606
Ozone	ThermoElectron Inc	49i A1NAA	1030244801	000695
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717852	000327
Sample Tower	Aluma Tower	A	none	03550
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14039	06406
Zero air pump	Werther International	C 70/4	000829161	06909

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number

SPD111-Sandy Grenville-05/13/2018

1	5/13/2018	Computer	Dell	07057	Inspiron 15	4H4MC12
2	5/13/2018	DAS	Campbell	000342	CR3000	2121
3	5/13/2018	Elevation	Elevation	None	1	None
4	5/13/2018	Filter pack flow pump	Thomas	04861	107CAB18	00019997
5	5/13/2018	Flow Rate	Apex	000459	AXMC105LPMDPCV	40577
6	5/13/2018	Infrastructure	Infrastructure	none	none	none
7	5/13/2018	Modem	Raven	06463	V4221-V	0808337428
8	5/13/2018	Ozone	ThermoElectron Inc	000742	49i A1NAA	1105347313
9	5/13/2018	Ozone Standard	ThermoElectron Inc	000450	49i A3NAA	CM08200026
10	5/13/2018	Sample Tower	Aluma Tower	03548	A	none
11	5/13/2018	Shelter Temperature	Campbell	none	107-L	none
12	5/13/2018	Siting Criteria	Siting Criteria	None	1	None
13	5/13/2018	Temperature	RM Young	04314	41342	4011
14	5/13/2018	UPS	APC	06096	RS800	080331133278
15	5/13/2018	Zero air pump	Werther International	06928	C 70/4	000822222

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2121	SPD111	Sandy Grenville	05/13/2018	DAS	Primary

Das Date: 5 /13/2018
Das Time: 12:41:20
Das Day: 133

Audit Date 5 /13/2018
Audit Time 12:41:20
Audit Day 133

Low Channel:

Avg Diff: 0.0001
Max Diff: 0.0002

High Channel:

Avg Diff: 0.0001
Max Diff: 0.0002

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

Mfg Fluke
Parameter DAS
Serial Number 95740135
Tfer Desc. DVM
Tfer ID 01311
Slope 1.00000
Intercept 0.00000
Cert Date 2/13/2018
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6995	0.6994	V	V	-0.0001
7	0.9000	0.8994	0.8992	V	V	-0.0002
7	1.0000	0.9993	0.9991	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	40577	SPD111	Sandy Grenville	05/13/2018	Flow Rate	000459

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number		**Tfer Desc.**	BIOS 220-H
Tfer ID	01414		
Slope	1.00055	**Intercept**	-0.01570
Cert Date	2/21/2018	**CorrCoff**	1.00000

DAS 1:

DAS 2:

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
1.32%	1.32%		

Cal Factor Zero -0.02

Cal Factor Full Scale 0.97

Rotometer Reading: 1.7

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	-0.01	l/m	l/m	
primary	test pt 1	1.504	1.520	1.53	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.507	1.520	1.53	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.509	1.520	1.53	0.000	1.50	l/m	l/m	-1.32%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.3 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347313	SPD111	Sandy Grenville	05/13/2018	Ozone	000742

Slope:	0.99197	**Slope:**	0.00000
Intercept	0.14502	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
1.0%	1.3%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00504	**Intercept**	0.32915
Cert Date	9/12/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	-0.31	-0.44	ppb	
primary	2	14.90	14.49	14.66	ppb	1.17%
primary	3	34.69	34.18	34.53	ppb	1.02%
primary	4	68.10	67.43	66.58	ppb	-1.26%
primary	5	110.00	109.12	108.50	ppb	-0.57%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.3	**Status**	pass
Sensor Component	Span	**Condition**	1.005	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	95.9 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.7 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	702.0 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	35.0 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	101.4 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.65 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	Not tested	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4011	SPD111	Sandy Grenville	05/13/2018	Temperature	04314

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00798	**Intercept**	0.09168
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.10	0.12		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.17	0.08	0.000	0.2	C	0.12
primary	Temp Mid Range	25.29	25.00	0.000	24.9	C	-0.09
primary	Temp High Range	48.00	47.53	0.000	47.5	C	-0.08

Sensor Component	Shield	**Condition**	Moderately clean	**Status**	pass
Sensor Component	Blower	**Condition**	N/A	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	SPD111	Sandy Grenville	05/13/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.67	0.89		

Mfg Extech

Parameter Shelter Temperatur

Serial Number H232734

Tfer Desc. RTD

Tfer ID 01227

Slope 1.00798

Intercept 0.09168

Cert Date 2/13/2018

CorrCoff 1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.37	22.10	0.000	22.7	C	0.63
primary	Temp Mid Range	25.46	25.17	0.000	26.1	C	0.89
primary	Temp Mid Range	27.61	27.30	0.000	26.8	C	-0.5

Sensor Component System Memo

Condition

Status pass

Infrastructure Data For

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 05/13/2018

Shelter Make	**Shelter Model**	**Shelter Size**
Ekto	8810	640 cuft

Sensor Component	Sample Tower Type	**Condition**	Type A	**Status**	pass
Sensor Component	Conduit	**Condition**	N/A	**Status**	pass
Sensor Component	Met Tower	**Condition**	N/A	**Status**	pass
Sensor Component	Moisture Trap	**Condition**	Installed	**Status**	pass
Sensor Component	Power Cables	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Temp Control	**Condition**	Functioning	**Status**	pass
Sensor Component	Rotometer	**Condition**	Installed	**Status**	pass
Sensor Component	Sample Tower	**Condition**	Fair	**Status**	pass
Sensor Component	Shelter Condition	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Door	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Roof	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Floor	**Condition**	Good	**Status**	pass
Sensor Component	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:** DasComments

The sample tower is an older Type A tower and some small cracks are present in the tower legs. The tower clamps are very rusty.

2 **Parameter:** SitingCriteriaCom

The site is in a pasture with as many as 75 cattle. The cattle are fed within 100 meters of the site. When the site is visited the cattle approach to within 10 meters of the site.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** MetOpMaintCom

The temperature signal cables is showing signs of wear.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 05/13/2018

Site Sponsor (agency)	EPA	**USGS Map**		Ausmus
Operating Group	private	**Map Scale**		
AQS #	47-025-9991	**Map Date**		
Meteorological Type	R.M. Young			
Air Pollutant Analyzer	Ozone	**QAPP Latitude**		
Deposition Measurement	dry, wet	**QAPP Longitude**		
Land Use	Agriculture, dairy, woodland - mixed	**QAPP Elevation Meters**		
Terrain	rolling / complex	**QAPP Declination**		
Conforms to MLM	Marginally	**QAPP Declination Date**		
Site Telephone	4238698159	**Audit Latitude**		36.46983
Site Address 1	718 Russell Hill Road	**Audit Longitude**		-83.826511
Site Address 2		**Audit Elevation**		361
County	Claiborne	**Audit Declination**		-5.1
City, State	, TN		**Present**	
Zip Code	37870	**Fire Extinguisher**	☑	New in 2015
Time Zone	Eastern	**First Aid Kit**	☑	
Primary Operator		**Safety Glasses**	☑	
Primary Op. Phone #		**Safety Hard Hat**	☑	
Primary Op. E-mail		**Climbing Belt**	☑	
Backup Operator		**Security Fence**	☐	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑ **Make** Ekto **Model** 8810 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is in good condition. The shelter is clean, neat, well organized and well maintained.

Site OK ☑ **Notes**

Driving Directions From I-75 take exit 134, 25W to 63 and LaFollette. Continue through LaFollette on 63 into Claiborne county. Just past mile marker 6 and the B&B gas and tire station in Claiborne county, turn right on an unmarked road. This road will end at a Tee after about 150 yds. Turn left at the Tee and then an immediate right at the next intersection onto Russell Hill Rd. The site will be on the right in the pasture behind the silo.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 05/13/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m	100 m	☐
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☐

Siting Criteria Comment

The site is in a pasture with as many as 75 cattle. The cattle are fed within 100 meters of the site. When the site is visited the cattle approach to within 10 meters of the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID SPD111

Technician Sandy Grenville

Site Visit Date 05/13/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 05/13/2018

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

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

The temperature signal cables is showing signs of wear.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 05/13/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	75 % saturated
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 05/13/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☐

11 **Tower comments?** Met tower removed

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

The sample tower is an older Type A tower and some small cracks are present in the tower legs. The tower clamps are very rusty.

Field Systems Data Form F-02058-1500-S7-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 05/13/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Nov 2011	☐
HASP	☑	Feb 2014	☑
Field Ops Manual	☑	July 1990	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 05/13/2018

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 05/13/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID SPD111 **Technician** Sandy Grenville **Site Visit Date** 05/13/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	4H4MC12	07057
DAS	Campbell	CR3000	2121	000342
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	00019997	04861
Flow Rate	Apex	AXMC105LPMDPC	40577	000459
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808337428	06463
Ozone	ThermoElectron Inc	49i A1NAA	1105347313	000742
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200026	000450
Sample Tower	Aluma Tower	A	none	03548
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4011	04314
UPS	APC	RS800	080331133278	06096
Zero air pump	Werther International	C 70/4	000822222	06928

Site Inventory by Site Visit

DIN431-Martin Valvur-05/17/2018

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
1	5/17/2018	Computer	Hewlett Packard	none	ProBook	5CB22906V2
2	5/17/2018	DAS	Environmental Sys Corp	90652	8816	2565
3	5/17/2018	elevation	Elevation	none	none	none
4	5/17/2018	Filter pack flow pump	Thomas	none	107CA18	0191007241
5	5/17/2018	flow rate	Mykrolis	none	FC280SAV-4S	AW902153
6	5/17/2018	Infrastructure	Infrastructure	none	none	none
7	5/17/2018	MFC power supply	Tylan	none	RO-32	FP9706002
8	5/17/2018	Modem	US Robotics	none	V.92	1MCWZ4iN2382
9	5/17/2018	Ozone	ThermoElectron Inc	none	49i A3NAA	1211052490
10	5/17/2018	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	CM08460050
11	5/17/2018	Shelter Temperature	ARS	none	unknown	none
12	5/17/2018	siting criteria	Siting Criteria	none	none	None
13	5/17/2018	Temperature2meter	RM Young	none	41342	4273
14	5/17/2018	Zero air pump	Werther International	none	PC70/4	531395

DAS Data Form

DAS Time Max Error: 1.57

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2565	DIN431	Martin Valvur	05/17/2018	DAS	Primary

Das Date: 5 /17/2018
Das Time: 8:56:00
Das Day: 137

Audit Date 5 /17/2018
Audit Time 8:54:26
Audit Day 137

Low Channel:

Avg Diff: 0.0002
Max Diff: 0.0003

High Channel:

Avg Diff: 0.0002
Max Diff: 0.0003

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

Mfg Fluke
Parameter DAS
Serial Number 95740243
Tfer Desc. DVM
Tfer ID 01312
Slope 1.00000
Intercept 0.00000
Cert Date 2/14/2018
CorrCoff 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
10	0.0000	-0.0003	-0.0002	V	V	0.0001
10	0.1000	0.0995	0.0997	V	V	0.0002
10	0.3000	0.2994	0.2996	V	V	0.0002
10	0.5000	0.4992	0.4993	V	V	0.0001
10	0.7000	0.6995	0.6997	V	V	0.0002
10	0.9000	0.8995	0.8998	V	V	0.0003
10	1.0000	0.9999	0.9999	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Mykrolis	AW902153	DIN431	Martin Valvur	05/17/2018	flow rate	none

Mfg Tylan

SN/Owner ID FP9706002 none

Parameter MFC power supply

Mfg BIOS

Parameter Flow Rate

Serial Number 148613

Tfer Desc. BIOS 220-H

Tfer ID 01421

Slope 0.98450

Intercept 0.10300

Cert Date 3/1/2018

CorrCoff 1.00000

DAS 1:

DAS 2:

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
0.47%	0.63%		

Cal Factor Zero 0.044

Cal Factor Full Scale 10.91

Rotometer Reading: 3.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.04	0.0000	0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.04	0.0000	0.03	l/m	l/m	
primary	test pt 1	3.040	2.980	1.35	0.0000	2.99	l/m	l/m	0.47%
primary	test pt 2	3.072	3.020	1.35	0.0000	3.00	l/m	l/m	-0.63%
primary	test pt 3	3.071	3.010	1.35	0.0000	3.00	l/m	l/m	-0.30%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1211052490	DIN431	Martin Valvur	05/17/2018	Ozone	none

Slope:	0.98450	**Slope:**	0.00000
Intercept	0.64081	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.4%	3.0%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00801	**Intercept**	-0.05199
Cert Date	9/11/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.15	0.20	0.73	ppb	
primary	2	14.31	14.24	14.67	ppb	3.02%
primary	3	38.00	37.74	37.51	ppb	-0.61%
primary	4	67.48	66.99	67.33	ppb	0.51%
primary	5	110.34	109.51	108.10	ppb	-1.29%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	-0.4	**Status**	pass
Sensor Component	Span	**Condition**	1.004	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	0.0001	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.0000	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	80.2 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.3 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.67 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	620.0 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	35.5 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	76.8 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.4 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.65 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	619.1 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
RM Young	4273	DIN431	Martin Valvur	05/17/2018	Temperature2meter	none

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99986	**Intercept**	-0.01977
Cert Date	1/24/2018	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.05	0.06		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.03	0.05	0.0000	0.00	C	-0.05
primary	Temp Mid Rang	24.13	24.15	0.0000	24.21	C	0.06
primary	Temp High Rang	48.37	48.40	0.0000	48.43	C	0.03

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	DIN431	Martin Valvur	05/17/2018	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
0.31	0.57

DAS 2:

Abs Avg Err	Abs Max Er

Mfg Fluke

Parameter Shelter Temperatur

Serial Number 3275143

Tfer Desc. RTD

Tfer ID 01229

Slope 0.99986

Intercept -0.01977

Cert Date 1/24/2018

CorrCoff 1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.34	25.36	0.000	25.5	C	0.12
primary	Temp Mid Range	26.44	26.46	0.000	26.7	C	0.23
primary	Temp Mid Range	25.43	25.45	0.000	26.0	C	0.57

Sensor Component System Memo

Condition

Status pass

Infrastructure Data For

Site ID DIN431 **Technician** Martin Valvur **Site Visit Date** 05/17/2018

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

Sensor Component	Sample Tower Type	**Condition**	Type B	**Status**	pass
Sensor Component	Conduit	**Condition**	Good	**Status**	pass
Sensor Component	Met Tower	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Trap	**Condition**	Not 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	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:** SiteOpsProcComm

Filter handling procedures have improved since the previous audit. Gloves are being used to handle the filter.

2 **Parameter:** DasComments

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

3 **Parameter:** SiteOpsProcedures

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

4 **Parameter:** SitingCriteriaCom

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

5 **Parameter:** ShelterCleanNotes

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

6 **Parameter:** MetSensorComme

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	DIN431	**Technician**	Martin Valvur	**Site Visit Date**	05/17/2018

Site Sponsor (agency)	NPS	**USGS Map**		Dinosaur Quarry
Operating Group	NPS	**Map Scale**		
AQS #	49-047-1002	**Map Date**		
Meteorological Type	R.M. Young			
Air Pollutant Analyzer	Ozone	**QAPP Latitude**		40.4373
Deposition Measurement	dry	**QAPP Longitude**		-109.3046
Land Use	Desert	**QAPP Elevation Meters**		1463
Terrain	complex	**QAPP Declination**		10.7
Conforms to MLM	Marginally	**QAPP Declination Date**		
Site Telephone		**Audit Latitude**		40.4373
Site Address 1		**Audit Longitude**		-109.3046
Site Address 2		**Audit Elevation**		1463
County	Uintah	**Audit Declination**		10.7
City, State	Jensen, UT		**Present**	
Zip Code	84035	**Fire Extinguisher**	☐	Not present
Time Zone	Mountain	**First Aid Kit**	☐	
Primary Operator		**Safety Glasses**	☐	
Primary Op. Phone #		**Safety Hard Hat**	☐	
Primary Op. E-mail		**Climbing Belt**	☐	
Backup Operator		**Security Fence**	☐	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

Shelter Working Room ☑ **Make** American Portable B **Model** A0810 **Shelter Size** 640 cuft

Shelter Clean ☑ **Notes** The shelter is in good condition, clean, and well organized.

Site OK ☑ **Notes**

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

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID DIN431 **Technician** Martin Valvur **Site Visit Date** 05/17/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m	40 m	☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID DIN431 **Technician** Martin Valvur **Site Visit Date** 05/17/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☐	Mounted on south of tower, over shelter
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☐	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID DIN431 **Technician** Martin Valvur **Site Visit Date** 05/17/2018

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID DIN431 **Technician** Martin Valvur **Site Visit Date** 05/17/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	No
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID DIN431 **Technician** Martin Valvur **Site Visit Date** 05/17/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☑

11 Tower comments? One tower only

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID DIN431 **Technician** Martin Valvur **Site Visit Date** 05/17/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A
Wind speed sensor	☐	☐	☑
Wind direction sensor	☐	☐	☑
Temperature sensor	☑	☐	☐
Relative humidity sensor	☐	☐	☑
Solar radiation sensor	☐	☐	☑
Surface wetness sensor	☐	☐	☑
Wind sensor translator	☐	☐	☑
Temperature translator	☐	☐	☑
Humidity sensor translator	☐	☐	☑
Solar radiation translator	☐	☐	☑
Tipping bucket rain gauge	☐	☐	☑
Ozone analyzer	☑	☐	☐
Filter pack flow controller	☐	☑	☐
Filter pack MFC power supply	☐	☑	☐

	Yes	No	N/A
Data logger	☑	☐	☐
Data logger	☐	☐	☑
Strip chart recorder	☐	☐	☑
Computer	☐	☑	☐
Modem	☐	☑	☐
Printer	☐	☐	☑
Zero air pump	☐	☑	☐
Filter flow pump	☐	☑	☐
Surge protector	☐	☐	☑
UPS	☐	☐	☑
Lightning protection device	☐	☐	☑
Shelter heater	☐	☑	☐
Shelter air conditioner	☐	☑	☐

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

	Present		Current
Station Log	☐	Not present	☐
SSRF	☑		☑
Site Ops Manual	☐	Not present	☐
HASP	☐	Not present	☐
Field Ops Manual	☐	Not present	☐
Calibration Reports	☑	1/20/2014	☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	Flow & observation sections
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	Control charts not used

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

Field Systems Data Form F-02058-1500-S8-rev002

Site ID DIN431 **Technician** Martin Valvur **Site Visit Date** 05/17/2018

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐	Not performed	☐
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐	Not performed	☐
Analyzer Diagnostics Tests	☐	Not performed	☐
In-line Filter Replacement (at inlet)	☑	Monthly	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☐	Not performed	☐
Zero Air Desiccant Check	☑	Semiannually	☑

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID DIN431

Technician Martin Valvur

Site Visit Date 05/17/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed various times
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☐	Not performed	☐
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	Semiannually	☑
Sample Line Check for Dirt/Water	☐	Not performed	☐

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

Filter handling procedures have improved since the previous audit. Gloves are being used to handle the filter.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID DIN431 **Technician** Martin Valvur **Site Visit Date** 05/17/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	5CB22906V2	none
DAS	Environmental Sys Corp	8816	2565	90652
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	107CA18	0191007241	none
flow rate	Mykrolis	FC280SAV-4S	AW902153	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9706002	none
Modem	US Robotics	V.92	1MCWZ4iN2382	none
Ozone	ThermoElectron Inc	49i A3NAA	1211052490	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	CM08460050	none
Shelter Temperature	ARS	unknown	none	none
siting criteria	Siting Criteria	none	None	none
Temperature2meter	RM Young	41342	4273	none
Zero air pump	Werther International	PC70/4	531395	none

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
FOR605-Martin Valvur-06/06/2018						
1	6/6/2018	DAS	Campbell	49922	CR1000	illegible
2	6/6/2018	elevation	Elevation	none	none	none
3	6/6/2018	Flow Rate	Omega	none	FMA6518ST-RS232	394013-3
4	6/6/2018	Infrastructure	Infrastructure	none	none	none
5	6/6/2018	Precipitation	Handar	none	444A	2998
6	6/6/2018	Relative Humidity	Vaisala	none	HMP45AC	Z3210004
7	6/6/2018	siting criteria	Siting Criteria	none	none	None
8	6/6/2018	Solar Radiation	Licor	none	LI-200	PY47986
9	6/6/2018	Temperature	Unknown	none	Unknown	none
10	6/6/2018	Wind Direction	Met One	illegible	024	J5213
11	6/6/2018	Wind Speed	Met One	none	014	K2278

Flow Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Omega	394013-3	FOR605	Martin Valvur	06/06/2018	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	0.98450	**Intercept**	0.10300
Cert Date	3/1/2018	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.39%	0.49%		

Cal Factor Zero 0.18

Cal Factor Full Scale 1.015

Rotometer Reading: 0

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.06	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.16	l/m	l/m	
primary	test pt 1	3.122	3.070	0.00	0.000	3.06	l/m	l/m	-0.49%
primary	test pt 2	3.119	3.060	0.00	0.000	3.05	l/m	l/m	-0.20%
primary	test pt 3	3.121	3.070	0.00	0.000	3.06	l/m	l/m	-0.49%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	N/A	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Met One	K2278	FOR605	Martin Valvur	06/06/2018	Wind Speed	none

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA4353	**Tfer Desc.**	wind speed motor (h
Tfer ID	01457		
Slope	1.00000	**Intercept**	0.00000
Cert Date	4/19/2018	**CorrCoff**	1.00000

Prop or Cups SN N/A

Prop or Cups Torque 0.3 **to** 0.3

Prop Correction Fact N/A

	DAS 1:		DAS 2:	
	Low Range	High Range	Low Range	High Range
Abs Avg Err				
Abs Max Er				

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Direction Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Met One	J5213	FOR605	Martin Valvur	06/06/2018	Wind Direction	illegible

Mfg Ushikata **Parameter** wind direction

Serial Number 190037 **Tfer Desc.** transit

Tfer ID 01265

Slope 1.00000 **Intercept** 0.00000

Cert Date 3/5/2018 **CorrCoff** 1.00000

Vane SN: N/A **C. A. Align. deg. true:** 355

VaneTorque 5 **to** 5

	DAS 1: **Orientation**	**Linearity:**	**DAS 2:** **Orientation**	**Linearity:**
Abs Avg Err	3.0			
Abs Max Er	5			

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01265	5	☐	0.000	5	0		0
primary	01265	85	☐	0.000	90	5		5
primary	01265	175	☐	0.000	177	2		2
primary	01265	267	☐	0.000	272	5		5

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Unknown	none	FOR605	Martin Valvur	06/06/2018	Temperature	none

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	0.99986	**Intercept**	-0.01977
Cert Date	1/24/2018	**CorrCoff**	1.00000

DAS 1:		**DAS 2:**	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.06	0.08		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.03	0.05	0.000	0.0	C	-0.04
primary	Temp Mid Range	23.45	23.47	0.000	23.6	C	0.08
primary	Temp High Range	47.81	47.84	0.000	47.8	C	-0.05

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	Z3210004	FOR605	Martin Valvur	06/06/2018	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	75296	**Tfer Desc.**	GTL
Tfer ID	01220		
Slope	0.95430	**Intercept**	1.78964
Cert Date	2/8/2018	**CorrCoff**	0.99980

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.4	3.9		
Abs Max Er	0.5	3.9		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	33.2	32.8	0.000	32.3	-0.5
primary	RH Low Range	GTL	52.9	51.8	52.9	0.000	52.7	-0.2
primary	RH High Range	GTL	93.6	86.6	93.6	0.000	89.7	-3.9

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY47986	FOR605	Martin Valvur	06/06/2018	Solar Radiation	none

Mfg Eppley
Parameter solar radiation
Serial Number 23824
Tfer Desc. SR transfer sensor
Tfer ID 01247
Slope 1.00000
Intercept 0.00000
Cert Date 2/14/2018
CorrCoff 1.00000

DAS 1:		**DAS 2:**	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
6.2%	7.4%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	6/6/2018	9:00	608	608	575	-5.4%
primary	6/6/2018	10:00	774	774	742	-4.2%
primary	6/6/2018	11:00	872	872	823	-5.6%
primary	6/6/2018	12:00	910	910	841	-7.6%
primary	6/6/2018	13:00	975	975	903	-7.4%

Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Sensor Level	**Condition**	Level	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Handar	2998	FOR605	Martin Valvur	06/06/2018	Precipitation	none

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

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.1%	2.1%		

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	5 sec	7.25	7.10	mm	mm	ml	-2.1%

Sensor Component	Properly Sited	**Condition**	45 degree rule	**Status**	pass
Sensor Component	Gauge Drain Screen	**Condition**	Installed	**Status**	pass
Sensor Component	Funnel Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Gauge Screen	**Condition**	Installed	**Status**	pass
Sensor Component	Gauge Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Level	**Condition**	Level	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Infrastructure Data For

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/06/2018

Shelter Make	**Shelter Model**	**Shelter Size**

Sensor Component	Sample Tower Type	**Condition**	Other	**Status**	pass
Sensor Component	Conduit	**Condition**	Good	**Status**	pass
Sensor Component	Met Tower	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Trap	**Condition**	Not installed	**Status**	pass
Sensor Component	Power Cables	**Condition**	Fair	**Status**	pass
Sensor Component	Shelter Temp Control	**Condition**	N/A	**Status**	pass
Sensor Component	Rotometer	**Condition**	Not installed	**Status**	pass
Sensor Component	Sample Tower	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Condition	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Door	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Roof	**Condition**	Good	**Status**	pass
Sensor Component	Shelter Floor	**Condition**	N/A	**Status**	pass
Sensor Component	Signal Cable	**Condition**	Good	**Status**	pass
Sensor Component	Tubing Type	**Condition**	3/8 teflon	**Status**	pass
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass

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. The site operator mentioned that he occasionally does not receive site support in a timely manner.

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 1.2 meters above the ground.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/06/2018

Site Sponsor (agency)	EPA	**USGS Map**		
Operating Group	BLM	**Map Scale**		
AQS #		**Map Date**		
Meteorological Type	Met One			
Air Pollutant Analyzer		**QAPP Latitude**		
Deposition Measurement	dry	**QAPP Longitude**		
Land Use	Range	**QAPP Elevation Meters**		
Terrain	Rolling	**QAPP Declination**		
Conforms to MLM	Marginally	**QAPP Declination Date**		
Site Telephone		**Audit Latitude**		44.339232
Site Address 1		**Audit Longitude**		-105.92023
Site Address 2		**Audit Elevation**		1402
County	Campbell	**Audit Declination**		9.3
City, State	Gillette, WY		**Present**	
Zip Code	82716	**Fire Extinguisher**	☐	
Time Zone	Mountain	**First Aid Kit**	☐	
Primary Operator		**Safety Glasses**	☐	
Primary Op. Phone #		**Safety Hard Hat**	☐	
Primary Op. E-mail		**Climbing Belt**	☐	
Backup Operator		**Security Fence**	☐	
Backup Op. Phone #		**Secure Shelter**	☑	
Backup Op. E-mail		**Stable Entry Step**	☑	

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

Shelter Clean ☐ **Notes** This is a small footprint site with instruments mounted in enclosure on tripod tower.

Site OK ☐ **Notes**

Driving Directions

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/06/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/06/2018

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:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/06/2018

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

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

The temperature sensor is now separate from the humidity sensor. The relative humidity measurement is 1.2 meters above the ground.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/06/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 teflon by 8 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	N/A
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☐	

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

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-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/06/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☑

11 Tower comments?

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

Field Systems Data Form F-02058-1500-S7-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/06/2018

Documentation

Does the site have the required instrument and equipment manuals?

	Yes	No	N/A
Wind speed sensor	☐	☐	☐
Wind direction sensor	☐	☐	☐
Temperature sensor	☐	☐	☐
Relative humidity sensor	☐	☐	☐
Solar radiation sensor	☐	☐	☐
Surface wetness sensor	☐	☐	☐
Wind sensor translator	☐	☐	☐
Temperature translator	☐	☐	☐
Humidity sensor translator	☐	☐	☐
Solar radiation translator	☐	☐	☐
Tipping bucket rain gauge	☐	☐	☐
Ozone analyzer	☐	☐	☐
Filter pack flow controller	☐	☐	☐
Filter pack MFC power supply	☐	☐	☐

	Yes	No	N/A
Data logger	☐	☐	☐
Data logger	☐	☐	☐
Strip chart recorder	☐	☐	☐
Computer	☐	☐	☐
Modem	☐	☐	☐
Printer	☐	☐	☐
Zero air pump	☐	☐	☐
Filter flow pump	☐	☐	☐
Surge protector	☐	☐	☐
UPS	☐	☐	☐
Lightning protection device	☐	☐	☐
Shelter heater	☐	☐	☐
Shelter air conditioner	☐	☐	☐

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

	Present		Current
Station Log	☐		☐
SSRF	☑		☐
Site Ops Manual	☐		☐
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

There is no 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.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/06/2018

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form F-02058-1500-S9-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/06/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	Flow section only
3	Are data downloads and backups being performed as scheduled?	☑	No longer required
4	Are general observations being made and recorded? How?	☐	
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	One set of gloves only
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

The dry deposition sample height is approximately 6 meters and not 10 meters. The observation section of the SSRF is not used. The site operator mentioned that he occasionally does not receive site support in a timely manner.

Field Systems Data Form

F-02058-1500-S10-rev002

Site ID FOR605 **Technician** Martin Valvur **Site Visit Date** 06/06/2018

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
Precipitation	Handar	444A	2998	none
Relative Humidity	Vaisala	HMP45AC	Z3210004	none
siting criteria	Siting Criteria	none	None	none
Solar Radiation	Licor	LI-200	PY47986	none
Temperature	Unknown	Unknown	none	none
Wind Direction	Met One	024	J5213	illegible
Wind Speed	Met One	014	K2278	none

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 7/21/2018 10:58:05 AM

SiteVisitDate	Site	Technician
04/26/2018	ALC188	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00068	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.87301	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.7	%	**P**
5	Ozone % difference max	P	7	10	4	4.7	%	**P**

EEMS Spot Report

Data Compiled: 7/22/2018 9:45:27 AM

SiteVisitDate	Site	Technician
06/04/2018	BAS601	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00258	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.02374	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.6	%	**P**
5	Ozone % difference max	P	7	10	4	1.2	%	**P**

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell A Tmp. **CommentCode** 99

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

EEMS Spot Report

Data Compiled: 7/21/2018 10:51:18 AM

SiteVisitDate	Site	Technician
04/23/2018	BBE401	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99145	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.70388	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99993	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.2	%	**P**
5	Ozone % difference max	P	7	10	4	9.9	%	**P**

EEMS Spot Report

Data Compiled: 7/22/2018 10:55:45 PM

SiteVisitDate	Site	Technician
06/16/2018	CAD150	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97654	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.28958	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
4	Ozone % difference avg	P	7	10	4	6.1	%	**P**
5	Ozone % difference max	P	7	10	4	9.6	%	**P**

EEMS Spot Report

Data Compiled: 7/19/2018 5:37:37 PM

SiteVisitDate	Site	Technician
04/03/2018	CAN407	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.21	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.47	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99814	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.26156	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.4	%	**P**
7	Ozone % difference max	P	7	10	4	3.4	%	**P**
8	Flow Rate average % difference	P	10	5	10	2.73	%	**P**
9	Flow Rate max % difference	P	10	5	10	3.08	%	**P**
10	DAS Voltage average error	P	12	0.003	63	0.0001	V	**P**
11	Shelter Temperature average error	P	5	2	18	0.72	c	**P**
12	Shelter Temperature max error	P	5	2	18	1.1	c	**P**

SiteVisitDate	Site	Technician
04/03/2018	CAN407	Martin Valvur

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The small parking lot at the visitors center is approximately 100m to the northeast.

2 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 7/22/2018 11:10:56 PM

SiteVisitDate	Site	Technician
06/23/2018	CDZ171	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99861	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.01538	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.2	%	**P**
5	Ozone % difference max	P	7	10	4	6.5	%	**P**

EEMS Spot Report

Data Compiled: 7/21/2018 10:35:04 AM

SiteVisitDate	Site	Technician
04/19/2018	CHA467	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.39	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.44	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98088	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.96843	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	4.9	%	**P**
7	Ozone % difference max	P	7	10	4	7.7	%	**P**
8	Flow Rate average % difference	P	10	5	10	0.49	%	**P**
9	Flow Rate max % difference	P	10	5	10	0.87	%	**P**
10	DAS Voltage average error	P	13	0.003	70	0.0003	V	**P**
11	Shelter Temperature average error	P	5	2	18	0.50	c	**P**
12	Shelter Temperature max error	P	5	2	18	0.99	c	**P**

SiteVisitDate	Site	Technician
04/19/2018	CHA467	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The site operator routinely reviews the previous week's data.

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** MetSensorComme

The temperature sensor is mounted on the south side of the meteorological tower.

5 **Parameter:** MetOpMaintCom

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

EEMS Spot Report

Data Compiled: 7/22/2018 11:05:40 PM

SiteVisitDate	Site	Technician
06/17/2018	CHE185	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.94545	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.67160	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99994	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.0	%	**P**
5	Ozone % difference max	P	7	10	4	5.6	%	**P**

EEMS Spot Report

Data Compiled: 7/22/2018 10:50:25 PM

SiteVisitDate	Site	Technician
06/15/2018	CVL151	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01283	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.14547	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99984	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.1	%	**P**
5	Ozone % difference max	P	7	10	4	10.2	%	**Fail**

EEMS Spot Report

Data Compiled: 7/22/2018 9:36:24 AM

SiteVisitDate	Site	Technician
05/17/2018	DIN431	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.05	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.06	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98450	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.64081	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.4	%	**P**
7	Ozone % difference max	P	7	10	4	3.0	%	**P**
8	Flow Rate average % difference	P	10	5	10	0.47	%	**P**
9	Flow Rate max % difference	P	10	5	10	0.63	%	**P**
10	DAS Voltage average error	P	10	0.003	70	0.0002	V	**P**
11	Shelter Temperature average error	P	5	2	9	0.31	c	**P**
12	Shelter Temperature max error	P	5	2	9	0.57	c	**P**

SiteVisitDate	**Site**	**Technician**
05/17/2018	DIN431	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Filter handling procedures have improved since the previous audit. Gloves are being used to handle the filter.

2 **Parameter:** DasComments

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

3 **Parameter:** SiteOpsProcedures

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

4 **Parameter:** SitingCriteriaCom

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

5 **Parameter:** ShelterCleanNotes

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

6 **Parameter:** MetSensorComme

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

EEMS Spot Report

Data Compiled: 7/21/2018 12:56:11 PM

SiteVisitDate	Site	Technician
05/12/2018	ESP127	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.34	c	**P**
2	Temperature max error	P	4	0.5	3	0.63	c	**Fail**
3	Ozone Slope	P	0	1.1	4	0.98976	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.44844	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.3	%	**P**
7	Ozone % difference max	P	7	10	4	3.5	%	**P**
8	Flow Rate average % difference	P	10	5	6	2.38	%	**P**
9	Flow Rate max % difference	P	10	5	6	2.6	%	**P**
10	DAS Voltage average error	P	7	0.003	63	0.0001	V	**P**
11	Shelter Temperature average error	P	5	2	15	0.24	c	**P**
12	Shelter Temperature max error	P	5	2	15	0.37	c	**P**

SiteVisitDate	**Site**	**Technician**
05/12/2018	ESP127	Sandy Grenville

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** DasComments

The Shelter is dirty and cluttered with no trash can and dead beetles on the counter top. The heater and air conditioner are operating simultaneously.

2 **Parameter:** ShelterCleanNotes

The shelter has been improved since the previous audit, however there is still some rot in the walls.

EEMS Spot Report

Data Compiled: 7/22/2018 10:29:49 PM

SiteVisitDate	Site	Technician
06/06/2018	FOR605	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Wind Direction Input Deg True average error (de	P	2	5	8	3.0	degrees	**P**
2	Wind Direction Input Deg True max error (deg)	P	2	5	8	5	degrees	**P**
3	Temperature average error	P	4	0.5	3	0.06	c	**P**
4	Temperature max error	P	4	0.5	3	0.08	c	**P**
5	Relative Humidity average above 85%	P	6	10	1	3.9	%	**P**
6	Relative Humidity max above 85%	P	6	10	1	3.9	%	**P**
7	Relative Humidity average below 85%	P	6	10	2	0.3	%	**P**
8	Relative Humidity max below 85%	P	6	10	2	0.5	%	**P**
9	Solar Radiation % diff of avg	P	9	10	15	6.17	%	**P**
10	Solar Radiation % diff of max STD value	P	9	10	15	7.4	%	**P**
11	Precipitation average % difference	P	1	10	1	2.1	%	**P**
12	Precipitation max % difference	P	1	10	1	2.1	%	**P**
13	Flow Rate average % difference	P	10	5	2	0.39	%	**P**
14	Flow Rate max % difference	P	10	5	2	0.49	%	**P**

SiteVisitDate	**Site**	**Technician**
06/06/2018	FOR605	Martin Valvur

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. The site operator mentioned that he occasionally does not receive site support in a timely manner.

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 1.2 meters above the ground.

EEMS Spot Report

Data Compiled: 7/21/2018 11:41:30 AM

SiteVisitDate	Site	Technician
05/10/2018	GAS153	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	18	0.03	c	**P**
2	Temperature max error	P	4	0.5	18	0.04	c	**P**
3	Ozone Slope	P	0	1.1	4	0.93379	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.32697	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	11.2	%	**Fail**
7	Ozone % difference max	P	7	10	4	17.0	%	**Fail**
8	Flow Rate average % difference	P	10	5	3	3.02	%	**P**
9	Flow Rate max % difference	P	10	5	3	3.23	%	**P**
10	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**
11	Shelter Temperature average error	P	5	2	15	0.55	c	**P**
12	Shelter Temperature max error	P	5	2	15	1.08	c	**P**

SiteVisitDate	**Site**	**Technician**
05/10/2018	GAS153	Sandy Grenville

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell B Flow **CommentCode** 99

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

2 **Parameter:** Ozone **SensorComponent:** Cell A Flow **CommentCode** 99

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

EEMS Spot Report

Data Compiled: 7/21/2018 9:55:29 AM

SiteVisitDate	Site	Technician
04/17/2018	GRC474	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.09	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.13	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99403	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.42301	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.1	%	**P**
7	Ozone % difference max	P	7	10	4	3.3	%	**P**
8	Flow Rate average % difference	P	10	5	9	1.44	%	**P**
9	Flow Rate max % difference	P	10	5	9	1.55	%	**P**
10	DAS Voltage average error	P	13	0.003	70	0.0003	V	**P**
11	Shelter Temperature average error	P	5	2	18	0.76	c	**P**
12	Shelter Temperature max error	P	5	2	18	0.95	c	**P**

SiteVisitDate	**Site**	**Technician**
04/17/2018	GRC474	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** ShelterCleanNotes

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

3 **Parameter:** MetOpMaintCom

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

EEMS Spot Report

Data Compiled: 7/19/2018 8:33:44 PM

SiteVisitDate	Site	Technician
04/10/2018	IRL141	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.26	c	**P**
2	Temperature max error	P	4	0.5	9	0.63	c	**Fail**
3	Ozone Slope	P	0	1.1	4	0.99181	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.26706	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.7	%	**P**
7	Ozone % difference max	P	7	10	4	1.1	%	**P**
8	Flow Rate average % difference	P	10	5	3	1.1	%	**P**
9	Flow Rate max % difference	P	10	5	3	1.32	%	**P**
10	DAS Voltage average error	P	7	0.003	63	0.0000	V	**P**
11	Shelter Temperature average error	P	5	2	15	0.40	c	**P**
12	Shelter Temperature max error	P	5	2	15	0.83	c	**P**

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator is doing an excellent job of handling and changing the filter pack.

2 **Parameter:** SiteOpsProcedures

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

3 **Parameter:** SitingCriteriaCom

Sebastian has an estimated population of 18,000. The park operates a boat ramp with vehicle parking near the site. The site is surrounded on three sides by boat traffic using the ramp.

4 **Parameter:** ShelterCleanNotes

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

5 **Parameter:** MetOpMaintCom

The meteorological signals were not functioning upon arrival. The site operator removed the relative humidity signal which returned other signals to normal. Signal cables are showing signs of wear with some missing insulation and bear wires.

EEMS Spot Report

Data Compiled: 7/19/2018 7:36:57 PM

SiteVisitDate	Site	Technician
04/05/2018	JOT403	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.13	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.16	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00731	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.20872	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.2	%	**P**
7	Ozone % difference max	P	7	10	4	1.8	%	**P**
8	Flow Rate average % difference	P	10	5	10	1.58	%	**P**
9	Flow Rate max % difference	P	10	5	10	1.69	%	**P**
10	DAS Voltage average error	P	3	0.003	56	0.0001	V	**P**
11	Shelter Temperature average error	P	5	2	18	0.58	c	**P**
12	Shelter Temperature max error	P	5	2	18	0.69	c	**P**

SiteVisitDate	Site	Technician
04/05/2018	JOT403	Martin Valvur

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is only a few years old and is in good condition, clean and well organized but not grounded.

EEMS Spot Report

Data Compiled: 7/22/2018 10:43:35 PM

SiteVisitDate	Site	Technician
06/07/2018	NEC602	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01187	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.41665	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99994	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.1	%	**P**
5	Ozone % difference max	P	7	10	4	11.5	%	**Fail**

EEMS Spot Report

Data Compiled: 7/21/2018 9:08:33 AM

SiteVisitDate	Site	Technician
04/16/2018	PET427	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.66	c	**Fail**
2	Temperature2meter max error	P	5	0.5	3	0.76	c	**Fail**
3	Ozone Slope	P	0	1.1	4	0.99262	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.14499	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.4	%	**P**
7	Ozone % difference max	P	7	10	4	2.0	%	**P**
8	Flow Rate average % difference	P	10	5	2	0.39	%	**P**
9	Flow Rate max % difference	P	10	5	2	0.57	%	**P**
10	DAS Voltage average error	P	14	0.003	63	0.0001	V	**P**
11	Shelter Temperature average error	P	5	2	18	0.35	c	**P**
12	Shelter Temperature max error	P	5	2	18	0.79	c	**P**

SiteVisitDate	Site	Technician
04/16/2018	PET427	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

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

2 **Parameter:** DasComments

The heating and air conditioning systems run simultaneously. The towers are not grounded.

3 **Parameter:** DocumentationCo

The most recent calibration and maintenance report is not available onsite.

4 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 7/21/2018 12:14:05 PM

SiteVisitDate	Site	Technician
05/11/2018	SND152	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.04	c	**P**
2	Temperature max error	P	4	0.5	9	0.06	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99526	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.53683	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.3	%	**P**
7	Ozone % difference max	P	7	10	4	4.8	%	**P**
8	Flow Rate average % difference	P	10	5	2	1.32	%	**P**
9	Flow Rate max % difference	P	10	5	2	1.32	%	**P**
10	DAS Voltage average error	P	7	0.003	63	0.0000	V	**P**
11	Shelter Temperature average error	P	5	2	15	0.62	c	**P**
12	Shelter Temperature max error	P	5	2	15	0.77	c	**P**

SiteVisitDate	**Site**	**Technician**
05/11/2018	SND152	Sandy Grenville

Field Systems Comments

1 **Parameter:** DasComments

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

2 **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.

3 **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.

4 **Parameter:** ShelterCleanNotes

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

5 **Parameter:** MetSensorComme

The temperature sensor is mounted to the sample tower and is oriented to the west. The shield has faded to gray in color and is no longer white which may affect the reflectivity.

6 **Parameter:** MetOpMaintCom

The temperature sensor signal cable is now in poor condition with several sections of tape and many kinks.

EEMS Spot Report

Data Compiled: 7/22/2018 8:48:36 AM

SiteVisitDate	Site	Technician
05/13/2018	SPD111	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	15	0.10	c	**P**
2	Temperature max error	P	4	0.5	15	0.12	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99197	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.14502	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.0	%	**P**
7	Ozone % difference max	P	7	10	4	1.3	%	**P**
8	Flow Rate average % difference	P	10	5	9	1.32	%	**P**
9	Flow Rate max % difference	P	10	5	9	1.32	%	**P**
10	DAS Voltage average error	P	7	0.003	63	0.0001	V	**P**
11	Shelter Temperature average error	P	5	2	15	0.67	c	**P**
12	Shelter Temperature max error	P	5	2	15	0.89	c	**P**

SiteVisitDate	Site	Technician
05/13/2018	SPD111	Sandy Grenville

Field Systems Comments

1 **Parameter:** DasComments

The sample tower is an older Type A tower and some small cracks are present in the tower legs. The tower clamps are very rusty.

2 **Parameter:** SitingCriteriaCom

The site is in a pasture with as many as 75 cattle. The cattle are fed within 100 meters of the site. When the site is visited the cattle approach to within 10 meters of the site.

3 **Parameter:** ShelterCleanNotes

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

4 **Parameter:** MetOpMaintCom

The temperature signal cables is showing signs of wear.

EEMS Spot Report

Data Compiled: 7/19/2018 10:38:38 PM

SiteVisitDate	Site	Technician
04/12/2018	SUM156	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	12	0.22	c	**P**
2	Temperature max error	P	4	0.5	12	0.29	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00155	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.06424	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.4	%	**P**
7	Ozone % difference max	P	7	10	4	4.9	%	**P**
8	Flow Rate average % difference	P	10	5	3	2.17	%	**P**
9	Flow Rate max % difference	P	10	5	3	2.6	%	**P**
10	DAS Voltage average error	P	7	0.003	63	0.0001	V	**P**
11	Shelter Temperature average error	P	5	2	15	0.91	c	**P**
12	Shelter Temperature max error	P	5	2	15	1.39	c	**P**

SiteVisitDate	**Site**	**Technician**
04/12/2018	SUM156	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:** DasComments

The meteorological tower has been removed. The temperature sensor is mounted in a naturally aspirated shield on the sample tower which is not grounded.

2 **Parameter:** SitingCriteriaCom

The site is surrounded by pine trees on land managed by the forest service. A few trees are now 17 meters tall and within 17 meters of the sample tower. Most trees are 30 meters from the sample tower.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.. The site operator does an excellent job of organizing and maintaining the site.

4 **Parameter:** PollAnalyzerCom

There is water in the flow tubing outside the shelter. Trees to the north are less than 20 meters from the sample inlets.

5 **Parameter:** MetOpMaintCom

The temperature sensor shield is dirty and the signal cable is showing signs of wear.

EEMS Spot Report

Data Compiled: 7/19/2018 7:34:13 PM

SiteVisitDate	Site	Technician
04/06/2018	ZIO433	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00431	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.28805	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.8	%	**P**
5	Ozone % difference max	P	7	10	4	3.6	%	**P**

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
ZIO433-Martin Valvur-04/06/2018						
1	4/6/2018	DAS	Environmental Sys Corp	missing	8816	unknown1
2	4/6/2018	Ozone	ThermoElectron Inc	90568	49C	49C-59348-322
3	4/6/2018	Ozone Standard	ThermoElectron Inc	90728	49C	49C-70528-366

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-59348-322	ZIO433	Martin Valvur	04/06/2018	Ozone	90568

Slope: 1.00431 **Slope:** 0.00000

Intercept 0.28805 **Intercept** 0.00000

CorrCoff 0.99998 **CorrCoff** 0.00000

DAS 1:

A Avg % Diff: 1.8% **A Max % Di** 3.6%

DAS 2:

A Avg %Dif **A Max % Di**

Mfg ThermoElectron Inc **Parameter** ozone

Serial Number 49CPS-70008-364 **Tfer Desc.** Ozone primary stan

Tfer ID 01110

Slope 1.00801 **Intercept** -0.05199

Cert Date 9/11/2017 **CorrCoff** 1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.14	0.19	0.10	ppb	
primary	2	15.13	15.06	15.60	ppb	3.59%
primary	3	36.79	36.54	37.25	ppb	1.94%
primary	4	65.90	65.42	66.10	ppb	1.04%
primary	5	108.34	107.53	108.10	ppb	0.53%

Sensor Component Sample Train **Condition** Good **Status** pass

Sensor Component 22.5 degree rule **Condition** **Status** pass

Sensor Component Inlet Filter Condition **Condition** Clean **Status** pass

Sensor Component Battery Backup **Condition** N/A **Status** pass

Sensor Component Offset **Condition** -0.1 **Status** pass

Sensor Component Span **Condition** 1.008 **Status** pass

Sensor Component Zero Voltage **Condition** 0.0018 **Status** pass

Sensor Component Fullscale Voltage **Condition** 1.0028 **Status** pass

Sensor Component Cell A Freq. **Condition** 103.0 kHz **Status** pass

Sensor Component Cell A Noise **Condition** 0.8 ppb **Status** pass

Sensor Component Cell A Flow **Condition** 0.74 lpm **Status** pass

Sensor Component Cell A Pressure **Condition** 643.0 mmHg **Status** pass

Sensor Component Cell A Tmp. **Condition** 36.0 C **Status** pass

Sensor Component Cell B Freq. **Condition** 114.6 kHz **Status** pass

Sensor Component Cell B Noise **Condition** 0.6 ppb **Status** pass

Sensor Component Cell B Flow **Condition** 0.74 lpm **Status** pass

Sensor Component Cell B Pressure **Condition** 642.9 mmHg **Status** pass

Sensor Component Cell B Tmp. **Condition** **Status** pass

Sensor Component Line Loss **Condition** Not tested **Status** pass

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

Site Inventory by Site Visit

Site Visit Date		***Parameter***	***Mfg***	***Owner ID***	***Model Number***	***Serial Number***
BBE401-Sandy Grenville-04/23/2018						
1	4/23/2018	DAS	Environmental Sys Corp	90767	8816	4592
2	4/23/2018	Ozone	ThermoElectron Inc	90517	49C	49C-58468-318
3	4/23/2018	Ozone Standard	ThermoElectron Inc	90831	49C	0520012325
4	4/23/2018	Zero air pump	Twin Tower Engineering	none	TT70/4E	526293

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-58468-318	BBE401	Sandy Grenville	04/23/2018	Ozone	90517

Slope:	0.99145	**Slope:**	0.00000
Intercept	-0.70388	**Intercept**	0.00000
CorrCoff	0.99993	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.2%	9.9%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00504	**Intercept**	0.32915
Cert Date	9/12/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.11	-0.21	-0.19	ppb	
primary	2	15.20	14.79	13.33	ppb	-9.87%
primary	3	34.90	34.39	33.05	ppb	-3.90%
primary	4	67.80	67.13	66.00	ppb	-1.68%
primary	5	111.80	110.91	109.36	ppb	-1.40%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.1	**Status**	pass
Sensor Component	Span	**Condition**	1.004	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	Not tested	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	Not tested	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	96.8 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	1.3 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.73 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	654.8 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	33.2 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	81.3 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.76 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	655.0 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
ALC188-Sandy Grenville-04/26/2018						
1	4/26/2018	DAS	Campbell	000422	CR3000	2523
2	4/26/2018	Ozone	ThermoElectron Inc	000745	49i A1NAA	1105347310
3	4/26/2018	Ozone Standard	ThermoElectron Inc	000694	49i A3NAA	1030244815
4	4/26/2018	Zero air pump	Werther International	06916	C 70/4	000829158

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347310	ALC188	Sandy Grenville	04/26/2018	Ozone	000745

Slope:	1.00068	**Slope:**	0.00000
Intercept	-0.87301	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
2.7%	4.7%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00504	**Intercept**	0.32915
Cert Date	9/12/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	1.70	1.36	0.78	ppb	
primary	2	14.90	14.49	13.81	ppb	-4.69%
primary	3	34.80	34.29	33.04	ppb	-3.65%
primary	4	68.30	67.63	66.35	ppb	-1.89%
primary	5	110.10	109.22	108.80	ppb	-0.38%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	-0.70	**Status**	pass
Sensor Component	Span	**Condition**	1.034	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	104.1 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.59 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	711.1 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	32.2 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	93.1 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.69 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	711.4 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BAS601-Martin Valvur-06/04/2018						
1	6/4/2018	DAS	Campbell	none	CR1000	unknown1
2	6/4/2018	Ozone	ThermoElectron Inc	L0534684	49i A1NAA	1214552973
3	6/4/2018	Ozone Standard	ThermoElectron Inc	none	49i E3CAA	1214552971
4	6/4/2018	Zero air pump	Thomas	none	107CAB18	100800033636

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1214552973	BAS601	Martin Valvur	06/04/2018	Ozone	L0534684

Slope:	1.00258	**Slope:**	0.00000
Intercept	0.02374	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
0.6%	1.3%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00801	**Intercept**	-0.05199
Cert Date	9/11/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.23	0.27	0.47	ppb	
primary	2	15.28	15.21	15.02	ppb	-1.25%
primary	3	35.93	35.69	35.94	ppb	0.70%
primary	4	68.42	67.92	68.00	ppb	0.12%
primary	5	114.79	113.92	114.30	ppb	0.33%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Not tested	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.1	**Status**	pass
Sensor Component	Span	**Condition**	1.029	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	97.5 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.66 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	647.1 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	46.9 C	**Status**	Fail
Sensor Component	Cell B Freq.	**Condition**	68.8 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.69 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	646.5 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	BAS601	Martin Valvur	06/04/2018	Cell A Tmp.	ThermoElectron	3802	☐	☐

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

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
NEC602-Martin Valvur-06/07/2018						
1	6/7/2018	DAS	Campbell	none	CR1000	41007
2	6/7/2018	Filter pack flow pump	Thomas	none	107CAB18A	079600005244
3	6/7/2018	Ozone	ThermoElectron Inc	none	49i A1NAA	1214552974
4	6/7/2018	Ozone Standard	ThermoElectron Inc	L0534683	49i E3CAA	1214552972

Ozone Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
ThermoElectron Inc	1214552974	NEC602	Martin Valvur	06/07/2018	Ozone	none

Slope:	1.01187	**Slope:**	0.00000
Intercept	-1.41665	**Intercept**	0.00000
CorrCoff	0.99994	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.1%	11.5%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00801	**Intercept**	-0.05199
Cert Date	9/11/2017	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.19	0.24	-0.45	ppb	
primary	2	15.69	15.61	13.82	ppb	-11.47%
primary	3	35.10	34.87	33.52	ppb	-3.87%
primary	4	67.82	67.33	66.70	ppb	-0.94%
primary	5	111.45	110.61	110.70	ppb	0.08%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.4	**Status**	pass
Sensor Component	Span	**Condition**	1.062	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	87.1 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	1.1 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.61 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	627.4 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	36.4 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	67.4 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.8 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.62 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	626.8 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Site Inventory by Site Visit

Site Visit Date		Parameter	Mfg	Owner ID	Model Number	Serial Number
CVL151-Sandy Grenville-06/15/2018						
1	6/15/2018	DAS	Campbell	000410	CR3000	2508
2	6/15/2018	Ozone	ThermoElectron Inc	000698	49i A1NAA	1030244797
3	6/15/2018	Ozone Standard	ThermoElectron Inc	000464	49i A3NAA	0622717858
4	6/15/2018	Zero air pump	Werther International	06867	C 70/4	000814279

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244797	CVL151	Sandy Grenville	06/15/2018	Ozone	000698

Slope:	1.01283	**Slope:**	0.00000
Intercept	-1.14547	**Intercept**	0.00000
CorrCoff	0.99984	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
4.1%	10.2%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00470	**Intercept**	0.08880
Cert Date	6/12/2018	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.11	0.02	-0.03	ppb	
primary	2	14.00	13.84	12.43	ppb	-10.19%
primary	3	34.40	34.15	32.63	ppb	-4.45%
primary	4	68.00	67.59	66.92	ppb	-0.99%
primary	5	110.00	109.39	110.20	ppb	0.74%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.000	**Status**	pass
Sensor Component	Span	**Condition**	1.112	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	90.2 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.62 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	715.9 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	35.8 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	116.2 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	1.0 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.58 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	715.6 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CAD150-Sandy Grenville-06/16/2018						
1	6/16/2018	DAS	Campbell	000421	CR3000	2530
2	6/16/2018	Ozone	ThermoElectron Inc	000624	49i A1NAA	1009241792
3	6/16/2018	Ozone Standard	ThermoElectron Inc	000439	49i A3NAA	CM08200015
4	6/16/2018	Zero air pump	Werther International	06914	C 70/4	000829156

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241792	CAD150	Sandy Grenville	06/16/2018	Ozone	000624

Slope:	0.97654	**Slope:**	0.00000
Intercept	-1.28958	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

DAS 1:

DAS 2:

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
6.1%	9.6%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00470	**Intercept**	0.08880
Cert Date	6/12/2018	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	1.50	1.40	0.25	ppb	
primary	2	15.00	14.84	13.41	ppb	-9.64%
primary	3	35.00	34.74	32.42	ppb	-6.68%
primary	4	67.50	67.09	63.70	ppb	-5.05%
primary	5	109.80	109.19	105.70	ppb	-3.20%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.20	**Status**	pass
Sensor Component	Span	**Condition**	1.037	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	104.7 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.71 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	722.4 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	33.7 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	89.1 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.74 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	723.0 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CHE185-Sandy Grenville-06/17/2018						
1	6/17/2018	DAS	Environmental Sys Corp	120283	8832	A0382
2	6/17/2018	Ozone	Ecotech	87161	EC9810B	10-0064
3	6/17/2018	Ozone Standard	Ecotech	70864	GasCal1000	01-0429
4	6/17/2018	Zero air pump	Ecotech	none	8301LC	01-0658

Ozone Data Form

Mfg	**Serial Number Ta**	**Site**	**Technician**	**Site Visit Date**	**Parameter**	**Owner ID**
Ecotech	10-0064	CHE185	Sandy Grenville	06/17/2018	Ozone	87161

Slope:	0.94545	**Slope:**	0.00000
Intercept	0.67160	**Intercept**	0.00000
CorrCoff	0.99994	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.0%	5.6%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00470	**Intercept**	0.08880
Cert Date	6/12/2018	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.50	0.40	1.30	ppb	
primary	2	16.00	15.83	16.00	ppb	1.07%
primary	3	34.90	34.64	32.70	ppb	-5.60%
primary	4	68.00	67.59	64.40	ppb	-4.72%
primary	5	109.60	108.99	104.00	ppb	-4.58%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	Functioning	**Status**	pass
Sensor Component	Offset	**Condition**	N/A	**Status**	pass
Sensor Component	Span	**Condition**	1.017	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.49 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	707.9 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	37.4 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	N/A	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	N/A	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	N/A	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	N/A	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	about 3%	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
CDZ171-Sandy Grenville-06/23/2018						
1	6/23/2018	DAS	Campbell	000352	CR3000	2130
2	6/23/2018	Ozone	ThermoElectron Inc	000727	49i A1NAA	1105347320
3	6/23/2018	Ozone Standard	ThermoElectron Inc	000544	49i A3NAA	0929938242
4	6/23/2018	Zero air pump	Werther International	06879	C 70/4	000814275

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347320	CDZ171	Sandy Grenville	06/23/2018	Ozone	000727

Slope:	0.99861	**Slope:**	0.00000
Intercept	-1.01538	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

DAS 1: **DAS 2:**

A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
3.3%	6.5%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00470	**Intercept**	0.08880
Cert Date	6/12/2018	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.80	0.70	-0.20	ppb	
primary	2	15.00	14.84	13.88	ppb	-6.47%
primary	3	34.80	34.54	33.20	ppb	-3.88%
primary	4	67.70	67.29	66.20	ppb	-1.62%
primary	5	108.70	108.10	107.00	ppb	-1.02%

Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.000	**Status**	pass
Sensor Component	Span	**Condition**	1.018	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	N/A	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	88.7 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.7 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.74 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	697.7 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	35.3 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	91.8 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.9 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.79 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	Not tested	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass