2016 – 3rd Quarter Report
Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

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Prepared for:

U. S. Environmental Protection Agency

Prepared by:

environmental engineering
& measurement services, inc.

1128 NW 39th Drive
Gainesville, FL 32605

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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. Currently, the National Oceanic and Atmospheric Administration's multilayer inferential model (NOAA-MLM) described by Meyers et al. [1998] is used to derive deposition velocity estimates.

As of October 2016, the network is comprised of 95 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment Canada, Bureau of Land Management (BLM) and several independent partners. AMEC Foster Wheeler (AMEC) is responsible for operating the EPA and Environment Canada 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. Only four EPA sponsored sites that are operated by AMEC continue to operate meteorological sensors. Those sites are BEL116, BVL30, CHE185,

and PAL190. Five new sites in WY sponsored by EPA and operated by the BLM/ARS also operate meteorological sensors and are BAS601, NEC602, BUF603, FOR604, and SHE604. No site audits at stations operating meteorological sensors were performed during third quarter 2016.

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, ROM206, and BEL116. Those variables were audited at the BVL130 station during third quarter 2016. All of the trace gas results for those audits were found to be within acceptance criteria. The preliminary reports of those results were delivered following the audits and are not included in this report.

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
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

Sensor	Parameter	Audit Challenge	Acceptance Criteria
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	$0.9000 \leq m \leq 1.1000$
Ozone	Intercept		$-5.0 \text{ ppb} \leq b \leq 5.0 \text{ ppb}$
Ozone	Correlation Coefficient		$0.9950 \leq r$
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 Third Quarter 2016

This report consists of the systems and performance and other audit results from the CASTNET sites visited during the third quarter (July through September) of 2016. 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
DEN417	Without Met	NPS	07/07/2016	Denali National Park
SAL133	Without Met	EPA	07/19/2016	Salamonie Reservoir
MKG113	Without Met	EPA	08/15/2016	M. K. Goddard St. Park
ANA115	Without Met	EPA	08/15/2016	Ann Arbor
UVL124	Without Met	EPA	08/16/2016	Unionville
KEF112	Without Met	EPA	08/17/2016	Kane Experimental Forest
HOX148	Without Met	EPA	08/18/2016	Hoxeyville
PSU106	Without Met	EPA	08/22/2016	Penn State
RED004	Flow only	EPA	08/30/2016	Red Lake Nation
WST109	Without Met	EPA	09/15/2016	Woodstock
ABT147	Without Met	EPA	09/17/2016	Abington

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
STK138	Ozone	EPA	07/20/2016	Stockton
ALH157	Ozone	EPA	07/21/2016	Alhambra
VIN140	Ozone	EPA	07/22/2016	Vincennes
CNT169	Ozone	EPA	08/18/2016	Centennial
LRL117	Ozone	EPA	08/23/2016	Laurel Hill
NEC602	Ozone	BLM	08/24/2016	Newcastle
VOY413	Ozone	NPS	08/29/2016	Voyageurs NP
PRK134	Ozone	EPA	09/01/2016	Perkinstown
SAN189	Ozone	EPA	09/09/2016	Santee Sioux
GRB411	Ozone	NPS	09/18/2016	Great Basin NP
BVL130	Ozone, NO_y, SO_2, CO	EPA	09/24/2016	Bondville
GLR468	Ozone	NPS	09/26/2016	Glacier NP

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 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).

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 Sites Visited Third Quarter 2016

This report covers the results from the NADP sites surveyed during the third quarter (July through September) of 2016. The station names and dates of the audits are presented in Table 4.

Table 4. Sites Surveyed – Third Quarter 2016

Side ID	Network	Visit Date	Station Name
AK01	NTN	7/11/2016	Poker Creek
AK03	NTN	7/7/2016	Denali National Park-Mt. McKinley
AK97	NTN	7/5/2016	Katmai National Park-King Salmon
CO93	NTN	7/26/2016	Dry Lake
IL46	NTN/AMoN	7/21/2016	Alhambra
IL73	AMoN	7/20/2016	Stockton
IN20	NTN	7/19/2016	Roush Lake
IN22	NTN	7/22/2016	Southwest Purdue Agriculture Center
IN41	NTN	7/19/2016	Agronomy Center for Research and Extension
ID02	NTN	8/5/2016	Priest River Experimental Forest
ID03	NTN/AMoN	8/2/2016	Craters of the Moon National Monument
ID11	NTN	8/3/2016	Reynolds Creek
MI52	MDN/NTN/AMoN	8/15/2016	Ann Arbor
MI99	NTN	8/22/2016	Chassell
MN23	MDN/NTN	8/30/2016	Camp Ripley
MN28	NTN	8/31/2016	Grindstone Lake
MN32	NTN	8/29/2016	Voyageurs National Park-Sullivan Bay
ND00	NTN	8/23/2016	Theodore Roosevelt National Park-Painted Canyon
OR09	NTN	8/11/2016	Silver Lake Ranger Station
OR10	NTN	8/9/2016	H. J. Andrews Experimental Forest

Side ID	Network	Visit Date	Station Name
OR18	NTN	8/4/2016	Starkey Experimental Forest
OR97	NTN	8/10/2016	Hyslop Farm
PA13	MDN/NTN	8/21/2016	Allegheny Portage Railroad National Historic Site
PA29	MDN/NTN/AMoN	8/17/2016	Kane Experimental Forest
PA30	MDN/NTN	8/15/2016	Erie
PA42	MDN/NTN	8/22/2016	Leading Ridge
PA90	MDN	8/19/2016	Hills Creek State Park
SD04	NTN	8/24/2016	Wind Cave National Park-Elk Mountain
WI08	MDN/NTN	8/23/2016	Brule River
WI36	MDN/NTN	8/23/2016	Trout Lake
CT15	AMoN	9/17/2016	Abington
IL11	AMoN	9/24/2016	Bondville
MA22	NTN	9/14/2016	Boston University
MA98	NTN	9/14/2016	Arnold Arboretum
MT00	NTN	9/29/2016	Little Bighorn Battlefield National Monument
MT05	MDN/NTN	9/26/2016	Glacier National Park-Fire Weather Station
MT07	NTN	9/28/2016	Clancy
MT95	MDN	9/29/2016	Badger Peak
NY06	MDN/NTN	9/13/2016	Bronx
NY10	NTN	9/27/2016	Chautauqua
NY43	MDN/NTN	9/28/2016	Rochester
NY94	NTN	9/29/2016	Nick's Lake
OH71/71OH	NTN	9/26/2016	Wooster

Side ID	Network	Visit Date	Station Name
PA47	MDN/NTN	9/12/2016	Millersville
PA60	MDN	9/18/2016	Valley Forge
MT95	MDN	9/29/2016	Badger Peak

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*
DEN417-Martin Valvur-07/07/2016					
1 7/7/2016	Computer	Hewlett Packard	none	ProBook	5CB22906R7
2 7/7/2016	DAS	Environmental Sys Corp	90600	8816	2274
3 7/7/2016	Elevation	Elevation	None	1	None
4 7/7/2016	Filter pack flow pump	Thomas	none	107CAB18B	099800009739
5 7/7/2016	Flow Rate	Tylan	90966	FC280SAV	AW9706011
6 7/7/2016	Infrastructure	Infrastructure	none	none	none
7 7/7/2016	Mainframe	Climatronics	none	100081	1293
8 7/7/2016	Mainframe power supply	Climatronics	none	101074	685
9 7/7/2016	Met tower	Glen Martin Engineering	none	unknown	none
10 7/7/2016	MFC power supply	Tylan	90967	RO-32	FP9706004
11 7/7/2016	Modem	US Robotics	none	33.6 fax modem	unknown
12 7/7/2016	Ozone	ThermoElectron Inc	90778	49C	49C-77033-384
13 7/7/2016	Ozone Standard	ThermoElectron Inc	none	49C	49C-71310-368
14 7/7/2016	Printer	Hewlett Packard	none	840C	unknown
15 7/7/2016	Sample Tower	Aluma Tower	none	B	AT-71102-7I-5
16 7/7/2016	Shelter Temperature	ARS	none	none	006
17 7/7/2016	Siting Criteria	Siting Criteria	None	1	None
18 7/7/2016	Temperature2meter	RM Young	none	41342	018533
19 7/7/2016	Zero air pump	Werther International	none	PC70/4	526281

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2274	DEN417	Martin Valvur	07/07/2016	DAS	Primary

Das Date: 7 /7 /2016
Das Time: 8:20:00
Das Day: 189

Audit Date 7 /7 /2016
Audit Time 8:20:00
Audit Day 189

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0003	0.0002	0.0003

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0004	-0.0005	V	V	-0.0001
7	0.1000	0.0994	0.0997	V	V	0.0003
7	0.3000	0.2996	0.2997	V	V	0.0001
7	0.5000	0.4994	0.4997	V	V	0.0003
7	0.7000	0.7002	0.6999	V	V	-0.0003
7	0.9000	0.8996	0.8999	V	V	0.0003
7	1.0000	1.0000	1.0001	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9706011	DEN417	Martin Valvur	07/07/2016	Flow Rate	90966

Mfg	Tylan
SN/Owner ID	FP9706004 90967
Parameter	MFC power supply

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	0.99895	**Intercept**	0.01185
Cert Date	2/10/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
0.61%	0.64%			

Cal Factor Zero	0
Cal Factor Full Scale	0
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	-0.19	-0.146	-0.06	l/m	l/m	
primary	leak check	0.000	0.000	-0.18	-0.141	-0.05	l/m	l/m	
primary	test pt 1	2.992	2.980	2.58	2.586	3.00	l/m	l/m	0.60%
primary	test pt 2	2.992	2.980	2.58	2.586	3.00	l/m	l/m	0.64%
primary	test pt 3	2.989	2.980	2.58	2.586	3.00	l/m	l/m	0.60%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	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**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-0.5 cm	**Status**	fail
Sensor Component	Filter Azimuth	**Condition**	10 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	49C-77033-384	DEN417	Martin Valvur	07/07/2016	Ozone	90778

Slope:	1.06973	**Slope:**	0.00000
Intercept	-1.07240	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.7%	6.1%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.06	0.20	-0.69	ppb	
primary	2	27.93	28.24	28.88	ppb	2.27%
primary	3	50.31	50.65	53.20	ppb	5.03%
primary	4	80.18	80.57	85.02	ppb	5.52%
primary	5	110.40	110.85	117.60	ppb	6.09%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	1.2	pass
Span	1.030	pass
Zero Voltage	-0.0016	pass
Fullscale Voltage	0.9990	pass
Cell A Freq.	117.1 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.65 lpm	pass
Cell A Pressure	6.78.7 mmHg	pass
Cell A Tmp.	33.3 C	pass
Cell B Freq.	90.9 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.	N/A	pass
Line Loss	< 1 %	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	018533	DEN417	Martin Valvur	07/07/2016	Temperature2meter	none

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99980	Intercept	-0.02840
Cert Date	1/19/2016	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.12	0.28		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.04	0.07	0.000	0.13	C	0.06
primary	Temp Mid Rang	23.33	23.36	0.000	23.34	C	-0.02
primary	Temp High Rang	48.71	48.75	0.000	48.47	C	-0.28

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	006	DEN417	Martin Valvur	07/07/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.35	2.90		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	0.99980	Intercept	-0.02840
Cert Date	1/19/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.51	22.54	0.000	23.6	C	1.01
primary	Temp Mid Range	20.66	20.69	0.000	23.6	C	2.9
primary	Temp Mid Range	23.97	24.00	0.000	24.1	C	0.14

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
DEN417	Martin Valvur	07/07/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8814	896 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Good	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	DEN417	Martin Valvur	07/07/2016	Filter Position	Tylan	3168	☐	☑

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator uses one gloved hand, and the same glove, to remove and install the filter pack. Leak checks are performed when the ambient temperature is above -10 C.

2 **Parameter:** ShelterCleanNotes

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	DEN417	**Technician**	Martin Valvur	**Site Visit Date**	07/07/2016

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Healy C-4
Operating Group	NPS	**Map Scale**	
AQS #	02-068-0003	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	ozone, IMPROVE	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone	(907) 683-9638	**Audit Latitude**	63.7232
Site Address 1	mile 238 Parks Highway	**Audit Longitude**	-148.9676
Site Address 2		**Audit Elevation**	663
County	Denali Borough	**Audit Declination**	19.3
City, State	Denali Park, AK		**Present**
Zip Code	99755	**Fire Extinguisher**	☐
Time Zone	Alaska Time Zone	**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**	8814	**Shelter Size**	896 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, clean, neat, and very well organized.				
Site OK	☑	**Notes**					

Driving Directions

From either Anchorage or Fairbanks, take the Parks Highway (route 3) north or south respectively. Just south of the town of Healy turn west into Denali National Park. The road is well marked. Continue on the park road a few miles to the Park Headquarters. The site is approximately 100 yards up a residential road on the opposite side of the street from the headquarters parking lot.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID DEN417 **Technician** Martin Valvur **Site Visit Date** 07/07/2016

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	20 - 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	DEN417	Technician	Martin Valvur	Site Visit Date	07/07/2016

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	DEN417	Technician	Martin Valvur	Site Visit Date	07/07/2016

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	DEN417	Technician	Martin Valvur	Site Visit Date	07/07/2016

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 DEN417 **Technician** Martin Valvur **Site Visit Date** 07/07/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

Provide any additional 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 DEN417 **Technician** Martin Valvur **Site Visit Date** 07/07/2016

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	☑	Dataview	☑
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?	☑	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-S8-rev002

Site ID	DEN417	Technician	Martin Valvur	Site Visit Date	07/07/2016

Site operation procedures

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID DEN417 **Technician** Martin Valvur **Site Visit Date** 07/07/2016

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?	☑	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	☑	Weekly	☑
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	As needed	☑
Sample Line Check for Dirt/Water	☑	As needed	☑

Provide any additional 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 uses one gloved hand, and the same glove, to remove and install the filter pack. Leak checks are performed when the ambient temperature is above -10 C.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID DEN417 **Technician** Martin Valvur **Site Visit Date** 07/07/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	5CB22906R7	none
DAS	Environmental Sys Corp	8816	2274	90600
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	099800009739	none
Flow Rate	Tylan	FC280SAV	AW9706011	90966
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1293	none
Mainframe power supply	Climatronics	101074	685	none
Met tower	Glen Martin Engineering	unknown	none	none
MFC power supply	Tylan	RO-32	FP9706004	90967
Modem	US Robotics	33.6 fax modem	unknown	none
Ozone	ThermoElectron Inc	49C	49C-77033-384	90778
Ozone Standard	ThermoElectron Inc	49C	49C-71310-368	none
Printer	Hewlett Packard	840C	unknown	none
Sample Tower	Aluma Tower	B	AT-71102-7I-5	none
Shelter Temperature	ARS	none	006	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	018533	none
Zero air pump	Werther International	PC70/4	526281	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SAL133-Sandy Grenville-07/19/2016						
1	7/19/2016	Computer	Dell	07014	Inspiron 15	OF3WC8
2	7/19/2016	DAS	Campbell	000351	CR3000	2129
3	7/19/2016	Elevation	Elevation	None	1	None
4	7/19/2016	Filter pack flow pump	Thomas	00765	107CA110	0000141
5	7/19/2016	Flow Rate	Apex	000599	AXMC105LPMDPCV	illegible
6	7/19/2016	Infrastructure	Infrastructure	none	none	none
7	7/19/2016	Met tower	Universal Tower	03558	unknown	none
8	7/19/2016	Modem	Raven	06612	H4223-C	0844355815
9	7/19/2016	Ozone	ThermoElectron Inc	000741	49i A1NAA	1105347316
10	7/19/2016	Ozone Standard	ThermoElectron Inc	000370	49i A3NAA	0726124689
11	7/19/2016	Sample Tower	Aluma Tower	none	B	AT-51065-5-G-A
12	7/19/2016	Shelter Temperature	Campbell	none	107-L	none
13	7/19/2016	Siting Criteria	Siting Criteria	None	1	None
14	7/19/2016	Temperature	RM Young	06410	41342	14043
15	7/19/2016	Zero air pump	Werther International	06935	C 70/4	000829172

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2129	SAL133	Sandy Grenville	07/19/2016	DAS	Primary

Das Date: 7 /19/2016
Das Time: 18:51:00
Das Day: 201

Audit Date 7 /19/2016
Audit Time 18:51:00
Audit Day 201

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

Mfg Datel **Parameter** DAS
Serial Number 15510194 **Tfer Desc.** Source generator (D
Tfer ID 01320

Mfg Fluke **Parameter** DAS
Serial Number 95740135 **Tfer Desc.** DVM
Tfer ID 01311

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **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	0.2997	V	V	-0.0001
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6996	0.6995	V	V	-0.0001
7	0.9000	0.8994	0.8993	V	V	-0.0001
7	1.0000	0.9993	0.9992	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	SAL133	Sandy Grenville	07/19/2016	Flow Rate	000599

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
1.75%	1.96%			**Cal Factor Full Scale**	0
				Rotometer Reading:	0

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.02	0.000	-0.03	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	1.542	1.520	1.55	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.545	1.530	1.55	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.545	1.530	1.55	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**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.3 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347316	SAL133	Sandy Grenville	07/19/2016	Ozone	000741

Slope:	0.98516	**Slope:**	0.00000
Intercept	0.28944	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.7%	1.5%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	0.34	0.32	ppb	
primary	2	30.02	30.49	30.47	ppb	-0.07%
primary	3	50.04	50.61	50.43	ppb	-0.36%
primary	4	80.13	80.84	80.10	ppb	-0.92%
primary	5	110.30	111.15	109.50	ppb	-1.48%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.020	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	114.7 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	732.7 mmHg	pass
Cell A Tmp.	38.6 C	pass
Cell B Freq.	96.5 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.55 lpm	pass
Cell B Pressure	732.4 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14043	SAL133	Sandy Grenville	07/19/2016	Temperature	06410

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00772	**Intercept**	0.12514
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.10	0.16		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.18	0.05	0.000	0.2	C	0.16
primary	Temp Mid Range	25.15	24.83	0.000	24.9	C	0.04
primary	Temp High Range	47.84	47.35	0.000	47.3	C	-0.09

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	SAL133	Sandy Grenville	07/19/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.46	0.79		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00772	Intercept	0.12514
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.21	25.89	0.000	26.7	C	0.79
primary	Temp Mid Range	26.10	25.78	0.000	26.3	C	0.55
primary	Temp Mid Range	28.78	28.44	0.000	28.4	C	-0.04

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	07/19/2016

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** SitingCriteriaCom

The site is located next to a field usually planted with corn or soy beans.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition and there is evidence of a leak in the shelter roof and ants are present. It is clean, neat, and well organized. Only one light is working.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	SAL133	**Technician**	Sandy Grenville	**Site Visit Date**	07/19/2016

Site Sponsor (agency)	EPA	**USGS Map**	Lagro
Operating Group	private	**Map Scale**	
AQS #	18-169-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	agriculture	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone	(260) 782-2428	**Audit Latitude**	40.816038
Site Address 1	Hamilton Road	**Audit Longitude**	-85.661407
Site Address 2		**Audit Elevation**	250
County	Wabash	**Audit Declination**	-5
City, State	Lagro, IN		**Present**
Zip Code	46941	**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 fair condition and there is evidence of a leak in the shelter roof and ants are present. It is clean, neat, and well organized. Only one light is working.				
Site OK	☑	**Notes**					

Driving Directions

From Huntington, IN take route 9 south a few miles to Division Road. Turn right (west) on Division and continue several miles to S 750 E, turn left (south). Turn right (west) at the first intersection (E 50 S). Turn left (south) at the next road, Hamilton or 725E. The site is about 1 mile on the right.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID SAL133 **Technician** Sandy Grenville **Site Visit Date** 07/19/2016

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	20 m	☐
Limited agricultural operations	200 m	20 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 next to a field usually planted with corn or soy beans.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	07/19/2016

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	SAL133	Technician	Sandy Grenville	Site Visit Date	07/19/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID SAL133 **Technician** Sandy Grenville **Site Visit Date** 07/19/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID SAL133 **Technician** Sandy Grenville **Site Visit Date** 07/19/2016

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:

Site ID SAL133 **Technician** Sandy Grenville **Site Visit Date** 07/19/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	07/19/2016

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	☑	November 2009	☐
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:

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	07/19/2016

Documentation

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	07/19/2016

Site operation procedures

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

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

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

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

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

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

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

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	07/19/2016

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	07/19/2016

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	☐		☐
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:

Site ID	SAL133	Technician	Sandy Grenville	Site Visit Date	07/19/2016

Site operation procedures

Field Systems Data Form F-02058-1500-S10-rev002

Site ID SAL133 **Technician** Sandy Grenville **Site Visit Date** 07/19/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	OF3WC8	07014
DAS	Campbell	CR3000	2129	000351
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	0000141	00765
Flow Rate	Apex	AXMC105LPMDPC	illegible	000599
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	03558
Modem	Raven	H4223-C	0844355815	06612
Ozone	ThermoElectron Inc	49i A1NAA	1105347316	000741
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124689	000370
Sample Tower	Aluma Tower	B	AT-51065-5-G-A	none
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14043	06410
Zero air pump	Werther International	C 70/4	000829172	06935

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MKG113-Sandy Grenville-08/15/2016						
1	8/15/2016	Computer	Dell	07030	Inspiron 15	Unknown
2	8/15/2016	DAS	Campbell	000404	CR3000	2521
3	8/15/2016	Elevation	Elevation	None	1	None
4	8/15/2016	Filter pack flow pump	Thomas	03639	107CAB18	049400004427
5	8/15/2016	Flow Rate	Apex	000637	AXMC105LPMDPCV	illegible
6	8/15/2016	Infrastructure	Infrastructure	none	none	none
7	8/15/2016	Modem	Raven	06593	V4221-V	0844350394
8	8/15/2016	Ozone	ThermoElectron Inc	000703	49i A1NAA	1030244805
9	8/15/2016	Ozone Standard	ThermoElectron Inc	000374	49i A3NAA	0726124694
10	8/15/2016	Sample Tower	Aluma Tower	666362	B	AT-5107-E-4-11
11	8/15/2016	Shelter Temperature	Campbell	none	107-L	none
12	8/15/2016	Siting Criteria	Siting Criteria	None	1	None
13	8/15/2016	Temperature	RM Young	04313	41342	4010
14	8/15/2016	Zero air pump	Werther International	06937	C 70/4	000821896

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2521	MKG113	Sandy Grenville	08/15/2016	DAS	Primary

Das Date: 8 /15/2016
Das Time: 17:30:10
Das Day: 228

Audit Date 8 /15/2016
Audit Time 17:30:10
Audit Day 228

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

Mfg Datel **Parameter** DAS
Serial Number 15510194 **Tfer Desc.** Source generator (D
Tfer ID 01320

Mfg Fluke **Parameter** DAS
Serial Number 95740135 **Tfer Desc.** DVM
Tfer ID 01311

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **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	0.6996	0.6995	V	V	-0.0001
7	0.9000	0.8994	0.8993	V	V	-0.0001
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	MKG113	Sandy Grenville	08/15/2016	Flow Rate	000637

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
0.22%	0.67%			

Cal Factor Zero	0
Cal Factor Full Scale	1.001
Rotometer Reading:	1.6

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.09	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.01	l/m	l/m	
primary	test pt 1	1.514	1.500	1.50	0.000	1.51	l/m	l/m	0.67%
primary	test pt 2	1.516	1.500	1.50	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.516	1.500	1.50	0.000	1.50	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	180 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244805	MKG113	Sandy Grenville	08/15/2016	Ozone	000703

Slope:	1.00272	**Slope:**	0.00000
Intercept	-0.79901	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.02	0.35	-0.73	ppb	
primary	2	30.02	30.49	29.87	ppb	-2.03%
primary	3	50.06	50.63	50.24	ppb	-0.77%
primary	4	80.33	81.04	80.70	ppb	-0.42%
primary	5	110.07	110.92	110.10	ppb	-0.74%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.010	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	93.8 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.74 lpm	pass
Cell A Pressure	705.5 mmHg	pass
Cell A Tmp.	38.0 C	pass
Cell B Freq.	88.4 kHz	pass
Cell B Noise	1.0 ppb	pass
Cell B Flow	1.01 lpm	pass
Cell B Pressure	705.5 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4010	MKG113	Sandy Grenville	08/15/2016	Temperature	04313

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00772	**Intercept**	0.12514
Cert Date	2/28/2016	**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	0.19	0.06	0.000	0.1	C	0.04
primary	Temp Mid Range	25.12	24.80	0.000	24.8	C	0.01
primary	Temp High Range	48.00	47.51	0.000	47.5	C	-0.06

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	MKG113	Sandy Grenville	08/15/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.07	0.13		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00772	Intercept	0.12514
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	28.32	27.98	0.000	28.0	C	0.03
primary	Temp Mid Range	27.77	27.43	0.000	27.3	C	-0.13
primary	Temp Mid Range	27.94	27.60	0.000	27.6	C	0.04

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	MKG113	Technician	Sandy Grenville	Site Visit Date	08/15/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-4)	640 cuft

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

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

2 **Parameter:** ShelterCleanNotes

The shelter is clean and organized. Leak and rot below the air conditioner and on the floor under the counter. Mold beginning on walls and floor.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	MKG113	**Technician**	Sandy Grenville	**Site Visit Date**	08/15/2016

Site Sponsor (agency)	EPA	**USGS Map**	Hadley
Operating Group	PA/private	**Map Scale**	
AQS #	42-085-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE	**QAPP Latitude**	41.4250
Deposition Measurement	dry	**QAPP Longitude**	-80.1447
Land Use	woodland - mixed, agriculture	**QAPP Elevation Meters**	384
Terrain	gently rolling	**QAPP Declination**	9.25
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(724) 253-3685	**Audit Latitude**	41.426847
Site Address 1	M. K. Goddard St. Park	**Audit Longitude**	-80.145247
Site Address 2	684 Lake Wilhelm Rd.	**Audit Elevation**	377
County	Mercer	**Audit Declination**	-9.3
City, State	Sandy Lake, PA		
Zip Code	16145	**Fire Extinguisher** ☑	New in 2014
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** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2116-4)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is clean and organized. Leak and rot below the air conditioner and on the floor under the counter. Mold beginning on walls and floor.				
Site OK	☑	**Notes**					

Driving Directions From I-79 take exit 130 (route 358). Go west and bear right onto Sheakleyville Road. Continue less than a mile to the stop sign, and turn right onto Lake Wilhelm Road. Continue approximately 1.5 miles, just after crossing the lake the site will be visible on the right at the state park headquarters facility.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID MKG113 **Technician** Sandy Grenville **Site Visit Date** 08/15/2016

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	1.5 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	60 m	☐
Tree line	50 m	10 - 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	MKG113	Technician	Sandy Grenville	Site Visit Date	08/15/2016

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	MKG113	Technician	Sandy Grenville	Site Visit Date	08/15/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID MKG113 **Technician** Sandy Grenville **Site Visit Date** 08/15/2016

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?	☐	One tree as tall as inlet within 12 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?	☑	
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 MKG113 **Technician** Sandy Grenville **Site Visit Date** 08/15/2016

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID MKG113 **Technician** Sandy Grenville **Site Visit Date** 08/15/2016

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	☑	Feb 2014	☑
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 MKG113 **Technician** Sandy Grenville **Site Visit Date** 08/15/2016

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	July 2006, refresher training by Howell and Lavery
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	☑	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 MKG113 **Technician** Sandy Grenville **Site Visit Date** 08/15/2016

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed various times of day
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	☑	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 MKG113 **Technician** Sandy Grenville **Site Visit Date** 08/15/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07030
DAS	Campbell	CR3000	2521	000404
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	049400004427	03639
Flow Rate	Apex	AXMC105LPMDPC	illegible	000637
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844350394	06593
Ozone	ThermoElectron Inc	49i A1NAA	1030244805	000703
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124694	000374
Sample Tower	Aluma Tower	B	AT-5107-E-4-11	666362
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4010	04313
Zero air pump	Werther International	C 70/4	000821896	06937

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ANA115-Eric Hebert-08/15/2016						
1	8/15/2016	Computer	Dell	07017	Inspiron 15	Unknown
2	8/15/2016	DAS	Campbell	000338	CR3000	2117
3	8/15/2016	Elevation	Elevation	None	1	None
4	8/15/2016	Filter pack flow pump	Thomas	06025	107CAB18	060400022682
5	8/15/2016	Flow Rate	Apex	000809	AXMC105LPMDPCV	illegible
6	8/15/2016	Infrastructure	Infrastructure	none	none	none
7	8/15/2016	Modem	Raven	06588	V4221-V	0844352818
8	8/15/2016	Ozone	ThermoElectron Inc	000702	49i A1NAA	1030244799
9	8/15/2016	Ozone Standard	ThermoElectron Inc	000364	49i A3NAA	0726124687
10	8/15/2016	Sample Tower	Aluma Tower	000180	B	none
11	8/15/2016	Shelter Temperature	Campbell	none	107-L	none
12	8/15/2016	Siting Criteria	Siting Criteria	None	1	None
13	8/15/2016	Temperature	RM Young	06535	41342	14796
14	8/15/2016	Zero air pump	Werther International	06933	C 70/4	000836202

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2117	ANA115	Eric Hebert	08/15/2016	DAS	Primary

Das Date: 8 /15/2016
Das Time: 10:12:00
Das Day: 227

Audit Date 8 /15/2016
Audit Time 10:12:00
Audit Day 227

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**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	0.1000	0.0999	V	V	-0.0001
7	0.3000	0.3000	0.2999	V	V	-0.0001
7	0.5000	0.4999	0.4999	V	V	0.0000
7	0.7000	0.6999	0.6998	V	V	-0.0001
7	0.9000	0.8999	0.8998	V	V	-0.0001
7	1.0000	0.9998	0.9998	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	ANA115	Eric Hebert	08/15/2016	Flow Rate	000809

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.03
0.45%	0.67%			**Cal Factor Full Scale**	0.99
				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	-0.02	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	1.490	1.490	1.51	0.000	1.50	l/m	l/m	0.67%
primary	test pt 2	1.491	1.490	1.51	0.000	1.50	l/m	l/m	0.67%
primary	test pt 3	1.498	1.500	1.51	0.000	1.50	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 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	1030244799	ANA115	Eric Hebert	08/15/2016	Ozone	000702

Slope:	0.99502	**Slope:**	0.00000
Intercept	0.55491	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.6%	1.3%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.23	0.05	0.60	ppb	
primary	2	27.89	28.03	28.38	ppb	1.25%
primary	3	49.89	49.92	50.29	ppb	0.74%
primary	4	79.82	79.70	79.94	ppb	0.30%
primary	5	104.68	104.44	104.40	ppb	-0.04%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.003	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.7 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	712.5 mmHg	pass
Cell A Tmp.	37.7 C	pass
Cell B Freq.	102.9 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	712.2 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14796	ANA115	Eric Hebert	08/15/2016	Temperature	06535

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.08	0.12		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.11	0.17	0.000	0.2	C	0.06
primary	Temp Mid Range	25.74	25.60	0.000	25.7	C	0.05
primary	Temp High Range	50.10	49.78	0.000	49.9	C	0.12

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	ANA115	Eric Hebert	08/15/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.75	1.11		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00760	Intercept	-0.05710
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.28	24.15	0.000	24.8	C	0.61
primary	Temp Mid Range	28.65	28.49	0.000	28.0	C	-0.54
primary	Temp Mid Range	25.80	25.66	0.000	26.8	C	1.11

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ANA115	Technician	Eric Hebert	Site Visit Date	08/15/2016

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	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
Flow Rate	ANA115	Eric Hebert	08/15/2016	Moisture Present	Apex	3990	☐	☐

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

Field Systems Comments

1 **Parameter:** DasComments

The met tower has been removed. The DAS controls the shelter heating and cooling.

2 **Parameter:** SitingCriteriaCom

Site is confined within a fenced area that is somewhat small. There is available space adjacent to the fenced area that could be utilized to improve the instrument siting.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, however somewhat cluttered.

4 **Parameter:** PollAnalyzerCom

Moisture is present in the flow tubing outside of the shelter.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ANA115	**Technician**	Eric Hebert	**Site Visit Date**	08/15/2016

Site Sponsor (agency)	EPA	**USGS Map**	Pinckney
Operating Group	University of MI	**Map Scale**	
AQS #	26-161-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet, Hg	**QAPP Longitude**	
Land Use	woodland - mixed	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	(734) 426-0060	**Audit Latitude**	42.416636
Site Address 1	8420 Strawberry Lake Rd.	**Audit Longitude**	-83.90218
Site Address 2		**Audit Elevation**	266
County	Washtenaw	**Audit Declination**	-6.6
City, State	Dexter, MI		
Zip Code	48130		
Time Zone	Eastern		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

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

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is in fair condition, however somewhat cluttered.				
Site OK	☑	**Notes**					

Driving Directions

From Ann Arbor take I-94 west to exit 169 to Dexter, turning right (north) to Dexter. Continue a few miles to the stop sign and turn left. Continue approximately one block to the small park in the center of town and turn right (north). Continue through Dexter, across the railroad tracks and river. Turn left (west) just across the river on Huron River Drive. Continue about 8 miles on Huron River Drive which becomes a dirt road after the intersection of North Territorial Rd. The site is on the left, just past the first sharp turn in the road (to the right) where it becomes Strawberry Lake Road.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ANA115 **Technician** Eric Hebert **Site Visit Date** 08/15/2016

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

Site is confined within a fenced area that is somewhat small. There is available space adjacent to the fenced area that could be utilized to improve the instrument siting.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ANA115	Technician	Eric Hebert	Site Visit Date	08/15/2016

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 ANA115 **Technician** Eric Hebert **Site Visit Date** 08/15/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	ANA115	Technician	Eric Hebert	Site Visit Date	08/15/2016

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:

Moisture is present in the flow tubing outside of the shelter.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID ANA115 **Technician** Eric Hebert **Site Visit Date** 08/15/2016

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	

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

The met tower has been removed. The DAS controls the shelter heating and cooling.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	ANA115	Technician	Eric Hebert	Site Visit Date	08/15/2016

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 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 ANA115 **Technician** Eric Hebert **Site Visit Date** 08/15/2016

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	☐		☐
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, 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 ANA115 **Technician** Eric Hebert **Site Visit Date** 08/15/2016

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, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID ANA115 **Technician** Eric Hebert **Site Visit Date** 08/15/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07017
DAS	Campbell	CR3000	2117	000338
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060400022682	06025
Flow Rate	Apex	AXMC105LPMDPC	illegible	000809
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844352818	06588
Ozone	ThermoElectron Inc	49i A1NAA	1030244799	000702
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124687	000364
Sample Tower	Aluma Tower	B	none	000180
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14796	06535
Zero air pump	Werther International	C 70/4	000836202	06933

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
UVL124-Eric Hebert-08/16/2016						
1	8/16/2016	Computer	Dell	07012	Inspiron 15	Unknown
2	8/16/2016	DAS	Campbell	000423	CR3000	2517
3	8/16/2016	Elevation	Elevation	None	1	None
4	8/16/2016	Filter pack flow pump	Thomas	02973	107CAB18	0493002467
5	8/16/2016	Flow Rate	Apex	000600	AXMC105LPMDPCV	illegible
6	8/16/2016	Infrastructure	Infrastructure	none	none	none
7	8/16/2016	Modem	Raven	06466	V4221-V	0808339409
8	8/16/2016	Ozone	ThermoElectron Inc	000745	49i A1NAA	1105347315
9	8/16/2016	Ozone Standard	ThermoElectron Inc	000362	49i A3NAA	0726124686
10	8/16/2016	Sample Tower	Aluma Tower	03557	A	none
11	8/16/2016	Shelter Temperature	Campbell	none	107-L	none
12	8/16/2016	Siting Criteria	Siting Criteria	None	1	None
13	8/16/2016	Temperature	RM Young	06504	41342	14624
14	8/16/2016	Zero air pump	Werther International	06936	C 70/4	000829169

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2517	UVL124	Eric Hebert	08/16/2016	DAS	Primary

Das Date: 8 /16/2016
Das Time: 18:20:00
Das Day: 229

Audit Date 8 /16/2016
Audit Time 18:20:01
Audit Day 229

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0000

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0000

Mfg Datel **Parameter** DAS
Serial Number 4000392 **Tfer Desc.** Source generator (D
Tfer ID 01321

Mfg Fluke **Parameter** DAS
Serial Number 86590148 **Tfer Desc.** DVM
Tfer ID 01310

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **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	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.4999	0.4999	V	V	0.0000
7	0.7000	0.6999	0.6999	V	V	0.0000
7	0.9000	0.8999	0.8999	V	V	0.0000
7	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
Apex	illegible	UVL124	Eric Hebert	08/16/2016	Flow Rate	000600

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.02
0.44%	0.67%			**Cal Factor Full Scale**	0.99
				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	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	-0.03	l/m	l/m	
primary	test pt 1	1.497	1.490	1.51	0.000	1.50	l/m	l/m	0.67%
primary	test pt 2	1.504	1.500	1.50	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.516	1.510	1.51	0.000	1.50	l/m	l/m	-0.66%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	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	1105347315	UVL124	Eric Hebert	08/16/2016	Ozone	000745

Slope:	1.00000	**Slope:**	0.00000
Intercept	-0.57786	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.1%	3.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.10	0.18	-0.57	ppb	
primary	2	27.33	27.48	26.67	ppb	-2.95%
primary	3	50.12	50.15	50.14	ppb	-0.02%
primary	4	80.01	79.89	79.51	ppb	-0.48%
primary	5	104.98	104.74	103.80	ppb	-0.90%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	94.6 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	717.2 mmHg	pass
Cell A Tmp.	39.0 C	pass
Cell B Freq.	96.8 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.00 lpm	pass
Cell B Pressure	717.4 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14624	UVL124	Eric Hebert	08/16/2016	Temperature	06504

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.04	0.08		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	2.10	2.14	0.000	2.1	C	-0.02
primary	Temp Mid Range	26.67	26.53	0.000	26.5	C	-0.03
primary	Temp High Range	49.63	49.31	0.000	49.2	C	-0.08

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	UVL124	Eric Hebert	08/16/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.57	0.60		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00760	Intercept	-0.05710
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.15	26.01	0.000	26.6	C	0.6
primary	Temp Mid Range	25.88	25.74	0.000	26.3	C	0.54

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	UVL124	Technician	Eric Hebert	Site Visit Date	08/16/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type A	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	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	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 sample train leak-check performed every two weeks.

2 **Parameter:** DocumentationCo

The ozone diagnostic and observation sections of the SSRF were completed during the filter removal visit and not the installation visit as indicated on the form. This was noted during the previous audit visit. It was discussed with the site operator who indicated she would be recording the information on the correct date.

3 **Parameter:** SitingCriteriaCom

The site is located in an active agriculture field usually planted with beans or corn.

4 **Parameter:** ShelterCleanNotes

The shelter is clean and in good condition.

5 **Parameter:** MetOpMaintCom

Met tower removed and temperature mounted in naturally aspirated shield on sample tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	UVL124	**Technician**	Eric Hebert	**Site Visit Date**	08/16/2016

Site Sponsor (agency)	EPA	**USGS Map**	Ellington
Operating Group	private	**Map Scale**	
AQS #	26-157-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet	**QAPP Longitude**	
Land Use	agriculture	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone	(989) 673-5901	**Audit Latitude**	43.613572
Site Address 1	1821 E. Dickerson Rd.	**Audit Longitude**	-83.359869
Site Address 2		**Audit Elevation**	202
County	Tuscola	**Audit Declination**	-7
City, State	Unionville, MI		
Zip Code	48767	**Fire Extinguisher** (Present) ☑	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 clean and in good condition.

Site OK ☑ **Notes**

Driving Directions From Saginaw MI, take route 81 east through Caro. About 2.9 miles past the junction of SR24 and 81, turn left (north) on Colwood. There is a large church at that intersection. Continue on Colwood for about 6 miles to the intersection of Dickerson road. Turn left (west) at the stop sign. The site is on the right (north) side on the road behind the first farmhouse, where Fred Matt, the landowner resides.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID UVL124 **Technician** Eric Hebert **Site Visit Date** 08/16/2016

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	30 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 an active agriculture field usually planted with beans or corn.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	UVL124	Technician	Eric Hebert	Site Visit Date	08/16/2016

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 UVL124 **Technician** Eric Hebert **Site Visit Date** 08/16/2016

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:

Met tower removed and temperature mounted in naturally aspirated shield on sample tower.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	UVL124	Technician	Eric Hebert	Site Visit Date	08/16/2016

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 UVL124 **Technician** Eric Hebert **Site Visit Date** 08/16/2016

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?	Tower not grounded	

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	UVL124	Technician	Eric Hebert	Site Visit Date	08/16/2016

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2014	☑
HASP	☑	Oct 2014	☑
Field Ops Manual	☐		☐
Calibration Reports	☑	4/14/2016	☑
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:

The ozone diagnostic and observation sections of the SSRF were completed during the filter removal visit and not the installation visit as indicated on the form. This was noted during the previous audit visit. It was discussed with the site operator who indicated she would be recording the information on the correct date.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	UVL124	Technician	Eric Hebert	Site Visit Date	08/16/2016

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	☐		☑
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, 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:

Ozone sample train leak-check performed every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID UVL124 **Technician** Eric Hebert **Site Visit Date** 08/16/2016

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?	☑	With noted exceptions
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID UVL124 **Technician** Eric Hebert **Site Visit Date** 08/16/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07012
DAS	Campbell	CR3000	2517	000423
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0493002467	02973
Flow Rate	Apex	AXMC105LPMDPC	illegible	000600
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808339409	06466
Ozone	ThermoElectron Inc	49i A1NAA	1105347315	000745
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124686	000362
Sample Tower	Aluma Tower	A	none	03557
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14624	06504
Zero air pump	Werther International	C 70/4	000829169	06936

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
KEF112-Sandy Grenville-08/17/2016						
1	8/17/2016	Computer	Dell	07054	Inspiron 15	Unknown
2	8/17/2016	DAS	Campbell	000414	CR3000	2537
3	8/17/2016	Elevation	Elevation	None	1	None
4	8/17/2016	Filter pack flow pump	Thomas	000965	107CA18	00000878
5	8/17/2016	Flow Rate	Apex	000671	AXMC105LPMDPCV	illegible
6	8/17/2016	Infrastructure	Infrastructure	none	none	none
7	8/17/2016	Modem	Raven	06455	V4221-V	0808337420
8	8/17/2016	Ozone	ThermoElectron Inc	000728	49i A1NAA	1105347306
9	8/17/2016	Ozone Standard	ThermoElectron Inc	000432	49i A3NAA	CM08200008
10	8/17/2016	Sample Tower	Aluma Tower	03443	A	none
11	8/17/2016	Shelter Temperature	Campbell	none	107-L	none
12	8/17/2016	Shield (10 meter)	RM Young	01399	Aspirated 43408	none
13	8/17/2016	Siting Criteria	Siting Criteria	None	1	None
14	8/17/2016	Temperature	RM Young	06388	41342	13992
15	8/17/2016	Zero air pump	Werther International	06922	C 70/4	000836217

DAS Data Form

DAS Time Max Error: 0.07

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2537	KEF112	Sandy Grenville	08/17/2016	DAS	Primary

Das Date: 8 /17/2016
Das Time: 12:54:00
Das Day: 230

Audit Date 8 /17/2016
Audit Time 12:53:56
Audit Day 230

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

Mfg Datel **Parameter** DAS
Serial Number 15510194 **Tfer Desc.** Source generator (D
Tfer ID 01320

Mfg Fluke **Parameter** DAS
Serial Number 95740135 **Tfer Desc.** DVM
Tfer ID 01311

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **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	0.2998	V	V	0.0001
7	0.5000	0.4996	0.4997	V	V	0.0001
7	0.7000	0.6996	0.6996	V	V	0.0000
7	0.9000	0.8994	0.8995	V	V	0.0001
7	1.0000	0.9993	0.9994	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	KEF112	Sandy Grenville	08/17/2016	Flow Rate	000671

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.005
1.62%	1.71%			**Cal Factor Full Scale**	0.979
				Rotometer Reading:	1.55

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	test pt 1	1.538	1.520	1.53	0.000	1.50	l/m	l/m	-1.58%
primary	test pt 2	1.535	1.520	1.53	0.000	1.49	l/m	l/m	-1.71%
primary	test pt 3	1.536	1.520	1.53	0.000	1.50	l/m	l/m	-1.58%

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**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	20 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	1105347306	KEF112	Sandy Grenville	08/17/2016	Ozone	000728

Slope:	0.98447	**Slope:**	0.00000
Intercept	0.27377	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.3%	2.2%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.03	0.36	0.94	ppb	
primary	2	30.01	30.48	30.11	ppb	-1.21%
primary	3	50.14	50.71	49.60	ppb	-2.19%
primary	4	80.07	80.78	80.30	ppb	-0.59%
primary	5	110.34	111.20	109.70	ppb	-1.35%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.10	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	92.7 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	684.8 mmHg	pass
Cell A Tmp.	37.7 C	pass
Cell B Freq.	92.4 kHz	pass
Cell B Noise	0.9 lpm	pass
Cell B Flow	0.73 lpm	pass
Cell B Pressure	684.2 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	13992	KEF112	Sandy Grenville	08/17/2016	Temperature	06388

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00772	**Intercept**	0.12514
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.08	0.18		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.17	0.04	0.000	0.1	C	0.06
primary	Temp Mid Range	25.51	25.19	0.000	25.2	C	-0.01
primary	Temp High Range	49.69	49.19	0.000	49.0	C	-0.18

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	KEF112	Sandy Grenville	08/17/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.56	0.75		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00772	Intercept	0.12514
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.71	25.39	0.000	25.7	C	0.32
primary	Temp Mid Range	29.16	28.81	0.000	28.2	C	-0.61
primary	Temp Mid Range	24.34	24.03	0.000	24.8	C	0.75

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	KEF112	Technician	Sandy Grenville	Site Visit Date	08/17/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-14)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type A	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	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	Fair	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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	KEF112	Sandy Grenville	08/17/2016	Moisture Present	Apex	3652	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** SitingCriteriaCom

The site is in a clearing within the Kane Experimental Forest, the tree line is within 10 meters of the site.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and very well organized. The floor and bottom of walls are beginning to deteriorate.

4 **Parameter:** PollAnalyzerCom

Trees to the east are within 20 meters of the ozone inlet.

5 **Parameter:** MetSensorComme

The meteorological tower is attached to the shelter and the temperature sensor is positioned directly over the metal roof of the shelter.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	KEF112	**Technician**	Sandy Grenville	**Site Visit Date**	08/17/2016

Site Sponsor (agency)	EPA	**USGS Map**	James City
Operating Group	PAFS/private	**Map Scale**	
AQS #	42-047-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	41.5981
Deposition Measurement	dry, wet	**QAPP Longitude**	-78.7683
Land Use	woodland - mixed	**QAPP Elevation Meters**	622
Terrain	rolling	**QAPP Declination**	10.5
Conforms to MLM	Yes	**QAPP Declination Date**	2/24/2006
Site Telephone	(814) 837-8069	**Audit Latitude**	41.598119
Site Address 1	Kane Experimental Forest Hdqts	**Audit Longitude**	-78.767866
Site Address 2	Seven Mile Road	**Audit Elevation**	618
County	Elk	**Audit Declination**	-10.3
City, State	Kane, PA		
Zip Code	16735	**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** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2149-14)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is clean and very well organized. The floor and bottom of walls are beginning to deteriorate.				
Site OK	☑	**Notes**					

Driving Directions

From Kane go south on route 66 for approximately 1 mile. Just past the 2nd cemetery turn left. Continue to the stop sign just over the railroad tracks. Turn right and continue approximately 3.2 miles through the town of Lamont. About 0.5 mile past Lamont, turn left on a gravel road which is marked with a brown Forest Service sign for the NE Forest Experimental Station. Continue approximately 2 miles and bear left at the fork. The site is behind the green Forest Service buildings on the left.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID KEF112 **Technician** Sandy Grenville **Site Visit Date** 08/17/2016

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	10 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The site is in a clearing within the Kane Experimental Forest, the tree line is within 10 meters of the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	KEF112	Technician	Sandy Grenville	Site Visit Date	08/17/2016

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)	☐	Temperature sensor mounted over shelter roof
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

The meteorological tower is attached to the shelter and the temperature sensor is positioned directly over the metal roof of the shelter.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID KEF112 **Technician** Sandy Grenville **Site Visit Date** 08/17/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID KEF112 **Technician** Sandy Grenville **Site Visit Date** 08/17/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Trees to the east are within 20 meters of the ozone inlet.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID KEF112 **Technician** Sandy Grenville **Site Visit Date** 08/17/2016

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, SampleTower not grounded	

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID KEF112 **Technician** Sandy Grenville **Site Visit Date** 08/17/2016

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	☑	Oct 2011	☑
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 KEF112 **Technician** Sandy Grenville **Site Visit Date** 08/17/2016

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID KEF112 **Technician** Sandy Grenville **Site Visit Date** 08/17/2016

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings 90% 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, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☑	

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID KEF112 **Technician** Sandy Grenville **Site Visit Date** 08/17/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07054
DAS	Campbell	CR3000	2537	000414
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	00000878	000965
Flow Rate	Apex	AXMC105LPMDPC	illegible	000671
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808337420	06455
Ozone	ThermoElectron Inc	49i A1NAA	1105347306	000728
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200008	000432
Sample Tower	Aluma Tower	A	none	03443
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	RM Young	Aspirated 43408	none	01399
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	13992	06388
Zero air pump	Werther International	C 70/4	000836217	06922

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
HOX148-Eric Hebert-08/18/2016						
1	8/18/2016	Computer	Dell	07062	Inspiron 15	Unknown
2	8/18/2016	DAS	Campbell	000426	CR3000	2533
3	8/18/2016	Elevation	Elevation	None	1	None
4	8/18/2016	Filter pack flow pump	Thomas	04927	107CAB18	110300021225
5	8/18/2016	Flow Rate	Apex	000526	AXMC105LPMDPCV	48099
6	8/18/2016	Infrastructure	Infrastructure	none	none	none
7	8/18/2016	Modem	Raven	06480	H4222-C	0808311145
8	8/18/2016	Ozone	ThermoElectron Inc	000614	49i A1NAA	1009241794
9	8/18/2016	Ozone Standard	ThermoElectron Inc	000438	49i A3NAA	CM08200014
10	8/18/2016	Sample Tower	Aluma Tower	000131	B	none
11	8/18/2016	Shelter Temperature	Campbell	none	107-L	none
12	8/18/2016	Siting Criteria	Siting Criteria	None	1	None
13	8/18/2016	Temperature	RM Young	06544	41342	14805
14	8/18/2016	Zero air pump	Werther International	06938	C 70/4	000829164

DAS Data Form

DAS Time Max Error: 0.03

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2533	HOX148	Eric Hebert	08/18/2016	DAS	Primary

Das Date: 8 /18/2016 **Audit Date** 8 /18/2016
Das Time: 8:35:32 **Audit Time** 8:35:30
Das Day: 231 **Audit Day** 231

Low Channel:

Avg Diff:	Max Diff:
0.0000	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0000	0.0001

Mfg Datel **Parameter** DAS
Serial Number 4000392 **Tfer Desc.** Source generator (D
Tfer ID 01321

Mfg Fluke **Parameter** DAS
Serial Number 86590148 **Tfer Desc.** DVM
Tfer ID 01310

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **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	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.5000	0.5000	V	V	0.0000
7	0.7000	0.7000	0.7001	V	V	0.0001
7	0.9000	0.9000	0.9001	V	V	0.0001
7	1.0000	1.0000	1.0000	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	48099	HOX148	Eric Hebert	08/18/2016	Flow Rate	000526

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.05
0.44%	0.67%			**Cal Factor Full Scale**	1.06
				Rotometer Reading:	1.45

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.08	0.000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	-0.01	0.000	0.03	l/m	l/m	
primary	test pt 1	1.493	1.490	1.43	0.000	1.50	l/m	l/m	0.67%
primary	test pt 2	1.500	1.500	1.43	0.000	1.50	l/m	l/m	0.00%
primary	test pt 3	1.508	1.510	1.43	0.000	1.50	l/m	l/m	-0.66%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	235 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	1009241794	HOX148	Eric Hebert	08/18/2016	Ozone	000614

Slope:	0.98573	**Slope:**	0.00000
Intercept	0.47845	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.8%	0.9%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.05	0.33	1.08	ppb	
primary	2	27.87	28.01	27.75	ppb	-0.93%
primary	3	49.94	49.97	49.66	ppb	-0.62%
primary	4	79.81	79.69	79.08	ppb	-0.77%
primary	5	104.46	104.22	103.30	ppb	-0.88%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.60	pass
Span	1.022	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	90.7 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.89 lpm	pass
Cell A Pressure	715.1 mmHg	pass
Cell A Tmp.	41.9 C	Fail
Cell B Freq.	93.9 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	715.7 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo	See comments	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14805	HOX148	Eric Hebert	08/18/2016	Temperature	06544

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.12	0.24		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.03	0.09	0.000	0.1	C	-0.02
primary	Temp Mid Range	30.98	30.80	0.000	30.9	C	0.1
primary	Temp High Range	49.78	49.46	0.000	49.7	C	0.24

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	HOX148	Eric Hebert	08/18/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.52	0.89		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00760	Intercept	-0.05710
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	29.70	29.53	0.000	29.7	C	0.16
primary	Temp Mid Range	24.01	23.89	0.000	24.8	C	0.89

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	HOX148	Technician	Eric Hebert	Site Visit Date	08/18/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Not functioning	Status	Fail
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 Data Form

F-02058-1500-S1-rev002

Site ID	HOX148	**Technician**	Eric Hebert	**Site Visit Date**	08/18/2016

Site Sponsor (agency)	EPA	**USGS Map**	Hoxeyville
Operating Group	private	**Map Scale**	
AQS #	26-165-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use	woodlands - mixed	**QAPP Elevation Meters**	
Terrain	gently rolling	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone	(231) 862-3750	**Audit Latitude**	44.18089
Site Address 1	10637 South 9 Rd.	**Audit Longitude**	-85.73898
Site Address 2		**Audit Elevation**	297
County	Wexford	**Audit Declination**	-5
City, State	Cadillac, MI		
Zip Code	49601	**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** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is clean, neat, well organized. Major repairs are underway to the floor of the shelter.				
Site OK	☑	**Notes**					

Driving Directions

From Cadillac proceed west on route 55 for approximately 12.5 miles. Turn left (south) on Hoxeyville Road (S13) and continue approximately 2 miles to the first stop sign. Turn right (west) on an unmarked road and continue approximately 2 miles to 9 road. Turn left (south) on 9 road which is not paved and continue approximately 1 mile, the site is on the left.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID HOX148 **Technician** Eric Hebert **Site Visit Date** 08/18/2016

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km	~ 30 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	10 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

There is a co-generating and smelting facility in Cadillac approximately 30 km to the northeast. The site is located in a hay field which is cut 2 or 3 times per year.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	HOX148	Technician	Eric Hebert	Site Visit Date	08/18/2016

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:

Met tower removed and temperature installed in naturally aspirated shield on sample tower.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	HOX148	Technician	Eric Hebert	Site Visit Date	08/18/2016

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	HOX148	Technician	Eric Hebert	Site Visit Date	08/18/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID HOX148 **Technician** Eric Hebert **Site Visit Date** 08/18/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		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 shelter floor is being replaced. The shelter climate control is disabled due to the construction.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	HOX148	Technician	Eric Hebert	Site Visit Date	08/18/2016

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2014	☐
HASP	☑	Oct 2014	☐
Field Ops Manual	☑	June 1987	☐
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	HOX148	Technician	Eric Hebert	Site Visit Date	08/18/2016

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	10/20/2000 by ESE 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	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☑	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	N/A	☑

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

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

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

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

The ozone analyzer sample train is leak-checked every two weeks. The shelter climate control is disabled during repairs to the shelter. Although the shelter temperature is currently within acceptable limits there is an "Alarm High" temperature flag present on the site ozone monitor.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID HOX148 **Technician** Eric Hebert **Site Visit Date** 08/18/2016

Site operation procedures

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID HOX148 **Technician** Eric Hebert **Site Visit Date** 08/18/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07062
DAS	Campbell	CR3000	2533	000426
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	110300021225	04927
Flow Rate	Apex	AXMC105LPMDPC	48099	000526
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0808311145	06480
Ozone	ThermoElectron Inc	49i A1NAA	1009241794	000614
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200014	000438
Sample Tower	Aluma Tower	B	none	000131
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14805	06544
Zero air pump	Werther International	C 70/4	000829164	06938

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PSU106-Sandy Grenville-08/22/2016					
1 8/22/2016	Computer	Dell	07046	Inspiron 15	Unknown
2 8/22/2016	DAS	Campbell	000407	CR3000	2512
3 8/22/2016	Elevation	Elevation	None	1	None
4 8/22/2016	Filter pack flow pump	Thomas	06023	107CAB18	060400022676
5 8/22/2016	Flow Rate	Apex	000560	AXMC105LPMDPCV	50732
6 8/22/2016	Infrastructure	Infrastructure	none	none	none
7 8/22/2016	Modem	Raven	06483	V4221-V	0808310813
8 8/22/2016	Ozone	ThermoElectron Inc	000678	49i A1NAA	1030244791
9 8/22/2016	Ozone Standard	ThermoElectron Inc	000434	49i A3NAA	CM08200010
10 8/22/2016	Sample Tower	Aluma Tower	02747	A	none
11 8/22/2016	Shelter Temperature	Campbell	none	107-L	none
12 8/22/2016	Siting Criteria	Siting Criteria	None	1	None
13 8/22/2016	Temperature	RM Young	05048	41342VC	9683
14 8/22/2016	Zero air pump	Werther International	06921	C 70/4	000836216

DAS Data Form

DAS Time Max Error: 0.08

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2512	PSU106	Sandy Grenville	08/22/2016	DAS	Primary

Das Date: 8 /21/2016
Das Time: 17:22:00
Das Day: 234

Audit Date 8 /21/2016
Audit Time 17:21:55
Audit Day 234

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

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	12/23/2015	**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	0.8993	V	V	-0.0001
7	1.0000	0.9993	0.9992	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	50732	PSU106	Sandy Grenville	08/22/2016	Flow Rate	000560

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
0.66%	0.66%			

Cal Factor Zero	-0.05
Cal Factor Full Scale	0.94
Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.02	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	-0.03	l/m	l/m	
primary	test pt 1	1.525	1.510	1.58	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 2	1.528	1.510	1.58	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.529	1.510	1.58	0.000	1.50	l/m	l/m	-0.66%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**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**	0.0 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	1030244791	PSU106	Sandy Grenville	08/22/2016	Ozone	000678

Slope:	0.98609	**Slope:**	0.00000
Intercept	0.18438	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.0%	1.2%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.01	0.32	0.49	ppb	
primary	2	30.03	30.50	30.27	ppb	-0.75%
primary	3	50.03	50.60	50.07	ppb	-1.05%
primary	4	80.16	80.87	79.96	ppb	-1.13%
primary	5	110.13	110.98	109.60	ppb	-1.24%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.40	pass
Span	1.006	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.7 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.81 lpm	pass
Cell A Pressure	704.1 mmHg	pass
Cell A Tmp.	34.6 C	pass
Cell B Freq.	94.9 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	9683	PSU106	Sandy Grenville	08/22/2016	Temperature	05048

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00772	**Intercept**	0.12514
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.27	0.33		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.18	0.05	0.000	0.3	C	0.22
primary	Temp Mid Range	25.08	24.76	0.000	25.1	C	0.33
primary	Temp High Range	48.74	48.24	0.000	48.5	C	0.26

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	PSU106	Sandy Grenville	08/22/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.36	0.51		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00772	Intercept	0.12514
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.48	25.16	0.000	25.7	C	0.51
primary	Temp Mid Range	25.70	25.38	0.000	25.7	C	0.36
primary	Temp Mid Range	26.00	25.68	0.000	25.9	C	0.22

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	PSU106	Technician	Sandy Grenville	Site Visit Date	08/22/2016

Shelter Make	Shelter Model	Shelter Size
PSU	N/A	3840 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type A	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	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	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 site operator uses the filter bag as a glove when handling the filter pack.

2 **Parameter:** DasComments

The meteorological tower has been removed.

3 **Parameter:** SitingCriteriaCom

The site is within 10 km of State College which has a population of approximately 50,000. The site is located in a university agricultural research field.

4 **Parameter:** ShelterCleanNotes

The shelter is owned by the university and is clean and orderly. The site is part of the Surfrad network.

5 **Parameter:** MetOpMaintCom

The 10-meter temperature sensor is now mounted in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PSU106	**Technician**	Sandy Grenville	**Site Visit Date**	08/22/2016

Site Sponsor (agency)	EPA	**USGS Map**	Pine Grove Mills
Operating Group	PSU	**Map Scale**	
AQS #	42-027-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	40.7209
Deposition Measurement	dry	**QAPP Longitude**	-77.9316
Land Use	agriculture	**QAPP Elevation Meters**	376
Terrain	rolling - complex	**QAPP Declination**	10.9
Conforms to MLM	Marginally	**QAPP Declination Date**	9/16/2005
Site Telephone	(814) 237-5778	**Audit Latitude**	40.720902
Site Address 1	PSU Agriculture Research Farm	**Audit Longitude**	-77.931759
Site Address 2	Tadpole Road	**Audit Elevation**	364
County	Centre	**Audit Declination**	-10.7
City, State	Rockspring, PA		
Zip Code	16865	**Fire Extinguisher** (Present ☑)	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**	PSU	**Model**	N/A	**Shelter Size**	3840 cuft
Shelter Clean	☑	**Notes**	The shelter is owned by the university and is clean and orderly. The site is part of the Surfrad network.				
Site OK	☑	**Notes**					

Driving Directions

From 322 on the east side of State College, take SR 3024 south. After the traffic light at the intersection of route 26, SR 3024 will change to Whitehall Road. Continue on Whitehall road for approximately 3 miles to Fairbrook. Turn left on Tadpole Road in Fairbrook at the church. Continue approximately 0.5 miles, the site will be in the field on the right.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID PSU106 **Technician** Sandy Grenville **Site Visit Date** 08/22/2016

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	State College	☐
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	10 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 within 10 km of State College which has a population of approximately 50,000. The site is located in a university agricultural research field.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PSU106	Technician	Sandy Grenville	Site Visit Date	08/22/2016

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 PSU106 **Technician** Sandy Grenville **Site Visit Date** 08/22/2016

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

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

The 10-meter temperature sensor is now mounted in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	PSU106	Technician	Sandy Grenville	Site Visit Date	08/22/2016

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 20 meters
4	Describe dry dep sample tube.		3/8 teflon by 20 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 PSU106 **Technician** Sandy Grenville **Site Visit Date** 08/22/2016

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.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	PSU106	Technician	Sandy Grenville	Site Visit Date	08/22/2016

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 PSU106 **Technician** Sandy Grenville **Site Visit Date** 08/22/2016

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	Trained by previous operator
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☐	No backup operator
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

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

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	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 PSU106 **Technician** Sandy Grenville **Site Visit Date** 08/22/2016

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?	☐	gloves are not used
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 uses the filter bag as a glove when handling the filter pack.

Field Systems Data Form F-02058-1500-S10-rev002

Site ID PSU106 **Technician** Sandy Grenville **Site Visit Date** 08/22/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07046
DAS	Campbell	CR3000	2512	000407
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	060400022676	06023
Flow Rate	Apex	AXMC105LPMDPC	50732	000560
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0808310813	06483
Ozone	ThermoElectron Inc	49i A1NAA	1030244791	000678
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200010	000434
Sample Tower	Aluma Tower	A	none	02747
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	9683	05048
Zero air pump	Werther International	C 70/4	000836216	06921

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
RED004-Eric Hebert-08/30/2016						
1	8/30/2016	DAS	Campbell	none	CR850	28383
2	8/30/2016	elevation	Elevation	none	none	none
3	8/30/2016	Filter pack flow pump	Thomas	none	1420 VP	42624821
4	8/30/2016	Flow Rate	Apex	000527	AXMC105LPMDPCV	48100
5	8/30/2016	Infrastructure	Infrastructure	none	none	none
6	8/30/2016	Modem	Sierra wireless	07000	unknown	unknown
7	8/30/2016	Sample Tower	Aluma Tower	000813	B	unknown
8	8/30/2016	siting criteria	Siting Criteria	none	none	None
9	8/30/2016	Temperature	RM Young	06986	41342	024087

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	28383	RED004	Eric Hebert	08/30/2016	DAS	Primary

Das Date:	8 /30/2016	**Audit Date**	8 /30/2016
Das Time:	8:00:58	**Audit Time**	8:01:00
Das Day:	243	**Audit Day**	243

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

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	48100	RED004	Eric Hebert	08/30/2016	Flow Rate	000527

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00309	**Intercept**	-0.00231
Cert Date	4/21/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.38
0.00%	0.00%			**Cal Factor Full Scale**	0.987
				Rotometer Reading:	3

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.0000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.0000	-0.03	l/m	l/m	
primary	test pt 1	3.013	3.010	3.01	0.0000	3.01	l/m	l/m	0.00%
primary	test pt 2	3.021	3.010	3.01	0.0000	3.01	l/m	l/m	0.00%
primary	test pt 3	3.021	3.010	3.01	0.0000	3.01	l/m	l/m	0.00%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**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	024087	RED004	Eric Hebert	08/30/2016	Temperature	06986

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00760	**Intercept**	-0.05710
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.07	0.18		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.09	0.15	0.0000	0.0	C	-0.18
primary	Temp Mid Range	23.91	23.79	0.0000	23.8	C	-0.04
primary	Temp High Range	50.58	50.26	0.0000	50.3	C	0

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

Infrastructure Data For

Site ID	RED004	Technician	Eric Hebert	Site Visit Date	08/30/2016

Shelter Make	Shelter Model	Shelter Size

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Not installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	N/A	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	N/A	Status	pass
Sensor Component	Shelter Door	Condition	N/A	Status	pass
Sensor Component	Shelter Roof	Condition	N/A	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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	RED004	Eric Hebert	08/30/2016	Moisture Present	Apex	3319	☐	☐

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

Field Systems Comments

1 **Parameter:** DocumentationCo

There is no site logbook and all manuals are kept electronically since the site is a small footprint site with no place to store hardcopies.

2 **Parameter:** SitingCriteriaCom

The site was cleared when installed, however the underbrush is beginning to grow near the tower.

3 **Parameter:** ShelterCleanNotes

Small footprint site with enclosure for instruments only. No shelter.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	RED004	**Technician**	Eric Hebert	**Site Visit Date**	08/30/2016

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	Red Lake Nation / AMEC	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer		**QAPP Latitude**	
Deposition Measurement	dry	**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	47.86382
Site Address 1		**Audit Longitude**	-94.83535
Site Address 2		**Audit Elevation**	374
County	Beltrami	**Audit Declination**	
City, State	Redby, MN		
Zip Code	56670	**Fire Extinguisher** ☐	
Time Zone	Central	**First Aid Kit** ☐	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☐	
Backup Op. E-mail		**Stable Entry Step** ☐	

Present

Shelter Working Room	☐	**Make**		**Model**		**Shelter Size**	
Shelter Clean	☐	**Notes**	Small footprint site with enclosure for instruments only. No shelter.				
Site OK	☑	**Notes**					

Driving Directions

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID RED004 **Technician** Eric Hebert **Site Visit Date** 08/30/2016

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 was cleared when installed, however the underbrush is beginning to grow near the tower.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	RED004	Technician	Eric Hebert	Site Visit Date	08/30/2016

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 RED004 **Technician** Eric Hebert **Site Visit Date** 08/30/2016

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	RED004	Technician	Eric Hebert	Site Visit Date	08/30/2016

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:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID RED004 **Technician** Eric Hebert **Site Visit Date** 08/30/2016

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
8	Is the instrument shelter temperature controlled?	☑	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	RED004	Technician	Eric Hebert	Site Visit Date	08/30/2016

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

1	Is the station log properly completed during every site visit?	☐	No Logbook
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 site logbook and all manuals are kept electronically since the site is a small footprint site with no place to store hardcopies.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	RED004	Technician	Eric Hebert	Site Visit Date	08/30/2016

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained by AMEC technician 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	☑	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	☐	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 RED004 **Technician** Eric Hebert **Site Visit Date** 08/30/2016

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	☑	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 RED004 **Technician** Eric Hebert **Site Visit Date** 08/30/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Campbell	CR850	28383	none
elevation	Elevation	none	none	none
Filter pack flow pump	Thomas	1420 VP	42624821	none
Flow Rate	Apex	AXMC105LPMDPC	48100	000527
Infrastructure	Infrastructure	none	none	none
Modem	Sierra wireless	unknown	unknown	07000
Sample Tower	Aluma Tower	B	unknown	000813
siting criteria	Siting Criteria	none	None	none
Temperature	RM Young	41342	024087	06986

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
WST109-Sandy Grenville-09/15/2016						
1	9/15/2016	Computer	Dell	07026	Inspiron 15	2Z2MC12
2	9/15/2016	DAS	Campbell	000427	CR3000	2526
3	9/15/2016	Elevation	Elevation	None	1	None
4	9/15/2016	Filter pack flow pump	Thomas	00476	107CA18	000025705
5	9/15/2016	Flow Rate	Apex	000466	AXMC105LPMDPCV	43970
6	9/15/2016	Infrastructure	Infrastructure	none	none	none
7	9/15/2016	Modem	Raven	06598	V4221-V	0844349943
8	9/15/2016	Ozone	ThermoElectron Inc	000611	49i A1NAA	1009241795
9	9/15/2016	Ozone Standard	ThermoElectron Inc	000696	49i A3NAA	1030244812
10	9/15/2016	Sample Tower	Aluma Tower	missing	B	unknown
11	9/15/2016	Shelter Temperature	Campbell	none	107-L	none
12	9/15/2016	Siting Criteria	Siting Criteria	None	1	None
13	9/15/2016	Temperature	RM Young	04317	41342	4014
14	9/15/2016	Zero air pump	Werther International	06934	P 70/4	000821881

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2526	WST109	Sandy Grenville	09/15/2016	DAS	Primary

Das Date: 9 /15/2016
Das Time: 13:11:00
Das Day: 259

Audit Date 9 /15/2016
Audit Time 13:11:00
Audit Day 259

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

Mfg Datel **Parameter** DAS
Serial Number 15510194 **Tfer Desc.** Source generator (D
Tfer ID 01320

Mfg Fluke **Parameter** DAS
Serial Number 95740135 **Tfer Desc.** DVM
Tfer ID 01311

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **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	0.4994	0.4996	V	V	0.0002
7	0.7000	0.6993	0.6995	V	V	0.0002
7	0.9000	0.8993	0.8993	V	V	0.0000
7	1.0000	0.9992	0.9992	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	43970	WST109	Sandy Grenville	09/15/2016	Flow Rate	000466

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.002
1.92%	2.11%			**Cal Factor Full Scale**	1
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.01	0.000	0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	test pt 1	1.491	1.470	1.50	0.000	1.50	l/m	l/m	2.04%
primary	test pt 2	1.493	1.470	1.50	0.000	1.50	l/m	l/m	2.11%
primary	test pt 3	1.495	1.480	1.50	0.000	1.50	l/m	l/m	1.62%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 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	1009241795	WST109	Sandy Grenville	09/15/2016	Ozone	000611

Slope:	0.99396	**Slope:**	0.00000
Intercept	0.48937	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.2%	0.3%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.02	0.31	0.94	ppb	
primary	2	29.96	30.43	30.51	ppb	0.26%
primary	3	49.97	50.54	50.70	ppb	0.32%
primary	4	79.96	80.67	80.80	ppb	0.16%
primary	5	109.95	110.80	110.60	ppb	-0.18%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.20	pass
Span	1.005	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	91.2 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.74 lpm	pass
Cell A Pressure	717.9 mmHg	pass
Cell A Tmp.	35.6 C	pass
Cell B Freq.	91.9 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.75 lpm	pass
Cell B Pressure	717.6 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4014	WST109	Sandy Grenville	09/15/2016	Temperature	04317

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00772	**Intercept**	0.12514
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.11	0.21		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.17	0.04	0.000	0.3	C	0.21
primary	Temp Mid Range	25.93	25.61	0.000	25.7	C	0.12
primary	Temp High Range	49.10	48.60	0.000	48.6	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	WST109	Sandy Grenville	09/15/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.67	1.08		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00772	Intercept	0.12514
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	30.11	29.76	0.000	29.1	C	-0.68
primary	Temp Mid Range	26.27	25.94	0.000	27.0	C	1.08
primary	Temp Mid Range	29.80	29.45	0.000	29.2	C	-0.26

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	WST109	Technician	Sandy Grenville	Site Visit Date	09/15/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-16)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	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:** DasComments

The sample tower has been replaced and the met tower removed since the previous audit visit.

2 **Parameter:** SiteOpsProcedures

Ozone sample train leak checks are being conducted every two weeks.

3 **Parameter:** SitingCriteriaCom

The site is in a small clearing surrounded by mountain forest. There is a small parking lot used by forest service employees located 50 meters from the site.

4 **Parameter:** SiteOKNotes

State of NH Department of Environmental Services contact is Tom Fazzina (603) 271-0911 and tfazzina@DES.state.NH.US

5 **Parameter:** MetSensorComme

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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	WST109	**Technician**	Sandy Grenville	**Site Visit Date**	09/15/2016

Site Sponsor (agency)	EPA	**USGS Map**	Woodstock
Operating Group	IES/USFS	**Map Scale**	
AQS #	33-009-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	43.9446
Deposition Measurement	dry, wet	**QAPP Longitude**	-71.7008
Land Use	woodland - mixed	**QAPP Elevation Meters**	258
Terrain	complex	**QAPP Declination**	15.9
Conforms to MLM	No	**QAPP Declination Date**	12/28/2004
Site Telephone	(603) 726-4935	**Audit Latitude**	43.944519
Site Address 1	234 Mirror Lake Road	**Audit Longitude**	-71.700787
Site Address 2		**Audit Elevation**	255
County	Grafton	**Audit Declination**	-15.3
City, State	Campton, NH		
Zip Code	03223	**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** ☑	

Present

Shelter Working Room ☑	**Make**	Ekto	**Model**	8810 (s/n 2149-16)	**Shelter Size**	640 cuft
Shelter Clean ☑	**Notes**					
Site OK ☑	**Notes**	State of NH Department of Environmental Services contact is Tom Fazzina (603) 271-0911 and tfazzina@DES.state.NH.US				

Driving Directions From I-93 take exit 30 and go south on route 3 for approximately 2 miles. Turn right on Mirror Lake road and continue to the end of the road. The site is through the gate on the right.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID WST109 **Technician** Sandy Grenville **Site Visit Date** 09/15/2016

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	50 m	☐
Tree line	50 m	10 - 30 m	☐
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☐

Siting Criteria Comment

The site is in a small clearing surrounded by mountain forest. There is a small parking lot used by forest service employees located 50 meters from the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	WST109	Technician	Sandy Grenville	Site Visit Date	09/15/2016

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

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	WST109	Technician	Sandy Grenville	Site Visit Date	09/15/2016

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	WST109	Technician	Sandy Grenville	Site Visit Date	09/15/2016

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID WST109 **Technician** Sandy Grenville **Site Visit Date** 09/15/2016

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 has been replaced and the met tower removed since the previous audit visit.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID WST109 **Technician** Sandy Grenville **Site Visit Date** 09/15/2016

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 2001	☐
HASP	☑	Nov 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	WST109	Technician	Sandy Grenville	Site Visit Date	09/15/2016

Site operation procedures

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

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

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

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

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

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

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

Ozone sample train leak checks are being conducted every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID WST109 **Technician** Sandy Grenville **Site Visit Date** 09/15/2016

Site operation procedures

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID WST109 **Technician** Sandy Grenville **Site Visit Date** 09/15/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	2Z2MC12	07026
DAS	Campbell	CR3000	2526	000427
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	000025705	00476
Flow Rate	Apex	AXMC105LPMDPC	43970	000466
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844349943	06598
Ozone	ThermoElectron Inc	49i A1NAA	1009241795	000611
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244812	000696
Sample Tower	Aluma Tower	B	unknown	missing
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4014	04317
Zero air pump	Werther International	P 70/4	000821881	06934

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ABT147-Sandy Grenville-09/17/2016						
1	9/17/2016	Computer	Dell	07023	Inspiron 15	5C4MC12
2	9/17/2016	DAS	Campbell	000413	CR3000	2519
3	9/17/2016	Elevation	Elevation	None	1	None
4	9/17/2016	Filter pack flow pump	Thomas	02974	107CAB18	0493002469
5	9/17/2016	Flow Rate	Apex	000550	AXMC105LPMDPCV	50740
6	9/17/2016	Infrastructure	Infrastructure	none	none	none
7	9/17/2016	Modem	Raven	06609	H4223-C	0844356221
8	9/17/2016	Ozone	ThermoElectron Inc	000627	49i A1NAA	1009241772
9	9/17/2016	Ozone Standard	ThermoElectron Inc	000449	49i A3NAA	CM08200025
10	9/17/2016	Sample Tower	Aluma Tower	000017	B	AT-61152-A-H8-C
11	9/17/2016	Shelter Temperature	Campbell	none	107-L	none
12	9/17/2016	Siting Criteria	Siting Criteria	None	1	None
13	9/17/2016	Temperature	RM Young	06503	41342	14623
14	9/17/2016	Zero air pump	Werther International	06930	P 70/4	000829168

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2519	ABT147	Sandy Grenville	09/17/2016	DAS	Primary

Das Date: 9 /17/2016
Das Time: 12:36:00
Das Day: 261

Audit Date 9 /17/2016
Audit Time 12:36:00
Audit Day 261

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0001

Mfg Datel **Parameter** DAS
Serial Number 15510194 **Tfer Desc.** Source generator (D
Tfer ID 01320

Mfg Fluke **Parameter** DAS
Serial Number 95740135 **Tfer Desc.** DVM
Tfer ID 01311

Slope 1.00000 **Intercept** 0.00000
Cert Date 12/23/2015 **CorrCoff** 1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2996	0.2997	V	V	0.0001
7	0.5000	0.4995	0.4996	V	V	0.0001
7	0.7000	0.6995	0.6995	V	V	0.0000
7	0.9000	0.8993	0.8993	V	V	0.0000
7	1.0000	0.9992	0.9992	V	V	0.0000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	50740	ABT147	Sandy Grenville	09/17/2016	Flow Rate	000550

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99091	**Intercept**	0.03172
Cert Date	2/28/2016	**CorrCoff**	0.99988

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.04
0.44%	0.66%			**Cal Factor Full Scale**	0.98
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	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	0.03	0.000	0.00	l/m	l/m	
primary	test pt 1	1.521	1.500	1.52	0.000	1.50	l/m	l/m	0.00%
primary	test pt 2	1.524	1.510	1.51	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.526	1.510	1.51	0.000	1.50	l/m	l/m	-0.66%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	250 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	1009241772	ABT147	Sandy Grenville	09/17/2016	Ozone	000627

Slope:	0.97593	**Slope:**	0.00000
Intercept	0.31758	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.9%	2.3%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	0.34	0.74	ppb	
primary	2	29.99	30.46	30.11	ppb	-1.15%
primary	3	49.99	50.56	49.42	ppb	-2.25%
primary	4	80.00	80.71	79.06	ppb	-2.04%
primary	5	109.99	110.84	108.60	ppb	-2.02%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.20	pass
Span	0.997	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.3 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	717.4 mmHg	pass
Cell A Tmp.	38.4 C	pass
Cell B Freq.	94.2 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	717.4 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14623	ABT147	Sandy Grenville	09/17/2016	Temperature	06503

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00772	**Intercept**	0.12514
Cert Date	2/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.80	1.67		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.18	0.05	0.000	0.0	C	-0.01
primary	Temp Mid Range	26.02	25.70	0.000	25.0	C	-0.73
primary	Temp High Range	49.58	49.08	0.000	47.4	C	-1.67

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	ABT147	Sandy Grenville	09/17/2016	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.28	0.37		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00772	Intercept	0.12514
Cert Date	2/28/2016	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	27.40	27.07	0.000	27.3	C	0.2
primary	Temp Mid Range	27.59	27.25	0.000	27.5	C	0.26
primary	Temp Mid Range	26.41	26.08	0.000	25.7	C	-0.37

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ABT147	Technician	Sandy Grenville	Site Visit Date	09/17/2016

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2149-9)	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	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	ABT147	Sandy Grenville	09/17/2016	Moisture Present	Apex	3683	☐	☐

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

Field Systems Comments

1 **Parameter:** DasComments

The met tower has been removed.

2 **Parameter:** SitingCriteriaCom

Manure is routinely spread on the hay fields surrounding the site during the summer.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

4 **Parameter:** MetSensorComme

Temperature mounted in naturally aspirated shield on sample tower.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ABT147	**Technician**	Sandy Grenville	**Site Visit Date**	09/17/2016

Site Sponsor (agency)	EPA	**USGS Map**	Hampton
Operating Group	private	**Map Scale**	
AQS #	09-015-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	41.8402
Deposition Measurement	dry, wet	**QAPP Longitude**	-72.0111
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	209
Terrain	rolling	**QAPP Declination**	14.8
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(860) 974-2273	**Audit Latitude**	41.84046
Site Address 1	80 Ayers Road	**Audit Longitude**	-72.010368
Site Address 2		**Audit Elevation**	202
County	Windham	**Audit Declination**	-14.5
City, State	Abington, CT		**Present**
Zip Code	06230	**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 (s/n 2149-9)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is clean and well organized.				
Site OK	☑	**Notes**					

Driving Directions

From Hartford take I-84 east to exit 69. Continue on route 74 east to route 44. Take route 44 east to Abington. At the traffic light in Abington, turn right (south) on route 97. Continue approximately 1.3 miles to Ayers Road which will be on the left. Ayers Road is a single lane paved road. The site is through the gate at the end of the road, in the field at the top of the hill past the barn.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ABT147 **Technician** Sandy Grenville **Site Visit Date** 09/17/2016

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	10 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

Manure is routinely spread on the hay fields surrounding the site during the summer.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ABT147	Technician	Sandy Grenville	Site Visit Date	09/17/2016

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

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

Temperature mounted in naturally aspirated shield on sample tower.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID ABT147 **Technician** Sandy Grenville **Site Visit Date** 09/17/2016

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?**	☑	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	ABT147	Technician	Sandy Grenville	Site Visit Date	09/17/2016

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?	☑	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 ABT147 **Technician** Sandy Grenville **Site Visit Date** 09/17/2016

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 met tower has been removed.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID ABT147 **Technician** Sandy Grenville **Site Visit Date** 09/17/2016

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	☑	Sept 2016	☑
HASP	☑	Sept 2016	☑
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	ABT147	Technician	Sandy Grenville	Site Visit Date	09/17/2016

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	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	N/A	☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	Weekly	☑
Test Surface Wetness Response	☑	N/A	☑

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, 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 ABT147 **Technician** Sandy Grenville **Site Visit Date** 09/17/2016

Site operation procedures

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

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

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

Field Systems Data Form F-02058-1500-S10-rev002

Site ID ABT147 **Technician** Sandy Grenville **Site Visit Date** 09/17/2016

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	5C4MC12	07023
DAS	Campbell	CR3000	2519	000413
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0493002469	02974
Flow Rate	Apex	AXMC105LPMDPC	50740	000550
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4223-C	0844356221	06609
Ozone	ThermoElectron Inc	49i A1NAA	1009241772	000627
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200025	000449
Sample Tower	Aluma Tower	B	AT-61152-A-H8-C	000017
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14623	06503
Zero air pump	Werther International	P 70/4	000829168	06930

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: ####################

SiteVisitDate	Site	Technician
09/17/2016	ABT147	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	0.80	c	**Fail**
2	Temperature max error	P	4	0.5	12	1.67	c	**Fail**
3	Ozone Slope	P	0	1.1	4	0.97593	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.31758	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.9	%	**P**
7	Ozone % difference max	P	7	10	4	2.3	%	**P**
8	Flow Rate average % difference	P	10	5	3	0.44	%	**P**
9	Flow Rate max % difference	P	10	5	3	0.66	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	42	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.28	c	**P**
13	Shelter Temperature max error	P	5	2	12	0.37	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	42			
2	Shelter Temperature standard deviation		5	0	12			
3	Temperature standard deviation		4	0	12			

SiteVisitDate	Site	Technician
09/17/2016	ABT147	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 met tower has been removed.

2 **Parameter:** SitingCriteriaCom

Manure is routinely spread on the hay fields surrounding the site during the summer.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and well organized.

4 **Parameter:** MetSensorComme

Temperature mounted in naturally aspirated shield on sample tower.

EEMS Spot Report

Data Compiled: 7/27/2016 4:33:50 PM

SiteVisitDate	Site	Technician
07/21/2016	ALH157	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	0.97394	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.53928	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.6	%	**P**
5	Ozone % difference max	P	7	10	4	2.5	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 9/4/2016 2:59:28 PM

SiteVisitDate	Site	Technician
08/15/2016	ANA115	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.08	c	**P**
2	Temperature max error	P	4	0.5	6	0.12	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99502	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.55491	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.6	%	**P**
7	Ozone % difference max	P	7	10	4	1.2	%	**P**
8	Flow Rate average % difference	P	10	5	3	0.45	%	**P**
9	Flow Rate max % difference	P	10	5	3	0.67	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	56	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.75	c	**P**
13	Shelter Temperature max error	P	5	2	12	1.11	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	56			
2	Shelter Temperature standard deviation		5	0	12			
3	Temperature standard deviation		4	0	6			

SiteVisitDate	Site	Technician
08/15/2016	ANA115	Eric Hebert

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** DasComments

The met tower has been removed. The DAS controls the shelter heating and cooling.

2 **Parameter:** SitingCriteriaCom

Site is confined within a fenced area that is somewhat small. There is available space adjacent to the fenced area that could be utilized to improve the instrument siting.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, however somewhat cluttered.

4 **Parameter:** PollAnalyzerCom

Moisture is present in the flow tubing outside of the shelter.

EEMS Spot Report

Data Compiled: 10/15/2016 7:39:19 PM

SiteVisitDate	Site	Technician
09/24/2016	BVL130	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99046	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.34535	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.8	%	**P**
5	Ozone % difference max	P	7	10	4	2.5	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 10/20/2016 9:48:18 PM

SiteVisitDate	Site	Technician
08/18/2016	CNT169	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	1.07153	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.45958	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	6.4	%	**P**
5	Ozone % difference max	P	7	10	4	6.8	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 7/19/2016 9:49:39 AM

SiteVisitDate	Site	Technician
07/07/2016	DEN417	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	0.12	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.28	c	**P**
3	Ozone Slope	P	0	1.1	4	1.06973	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.0724	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	4.7	%	**P**
7	Ozone % difference max	P	7	10	4	6.1	%	**P**
8	Flow Rate average % difference	P	10	5	6	0.62	%	**P**
9	Flow Rate max % difference	P	10	5	6	0.64	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	56	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	15	1.35	c	**P**
13	Shelter Temperature max error	P	5	2	15	2.9	c	**Fail**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	56			
2	Shelter Temperature standard deviation		5	0	15			
3	Temperature2meter Standard Deviation		5	0	3			

SiteVisitDate	Site	Technician
07/07/2016	DEN417	Martin Valvur

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator uses one gloved hand, and the same glove, to remove and install the filter pack. Leak checks are performed when the ambient temperature is above -10 C.

2 **Parameter:** ShelterCleanNotes

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

EEMS Spot Report

Data Compiled: 10/22/2016 9:57:12 AM

SiteVisitDate	Site	Technician
09/26/2016	GLR468	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	1.0788	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.12526	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	7.7	%	**P**
5	Ozone % difference max	P	7	10	4	8.1	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 10/15/2016 7:22:32 PM

SiteVisitDate	Site	Technician
09/18/2016	GRB411	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.94866	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.61043	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
4	Ozone % difference avg	P	7	10	4	6.5	%	**P**
5	Ozone % difference max	P	7	10	4	8.7	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 9/4/2016 5:35:10 PM

SiteVisitDate	Site	Technician
08/18/2016	HOX148	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.12	c	**P**
2	Temperature max error	P	4	0.5	9	0.24	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98573	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.47845	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.8	%	**P**
7	Ozone % difference max	P	7	10	4	0.9	%	**P**
8	Flow Rate average % difference	P	10	5	6	0.44	%	**P**
9	Flow Rate max % difference	P	10	5	6	0.67	%	**P**
10	DAS Time maximum error	P	0	5	1	0.03	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	8	0.53	c	**P**
13	Shelter Temperature max error	P	5	2	8	0.89	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	49			
2	Shelter Temperature standard deviation		5	0	8			
3	Temperature standard deviation		4	0	9			

SiteVisitDate	Site	Technician
08/18/2016	HOX148	Eric Hebert

Field Performance Comments

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

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

2 **Parameter:** Ozone **SensorComponent:** Cell A Tmp. **CommentCode:** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

Field Systems Comments

1 **Parameter:** DasComments

The shelter floor is being replaced. The shelter climate control is disabled due to the construction.

2 **Parameter:** SiteOpsProcedures

The ozone analyzer sample train is leak-checked every two weeks. The shelter climate control is disabled during repairs to the shelter. Although the shelter temperature is currently within acceptable limits there is an "Alarm High" temperature flag present on the site ozone monitor.

3 **Parameter:** SitingCriteriaCom

There is a co-generating and smelting facility in Cadillac approximately 30 km to the northeast. The site is located in a hay field which is cut 2 or 3 times per year.

4 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, well organized. Major repairs are underway to the floor of the shelter.

5 **Parameter:** MetSensorComme

Met tower removed and temperature installed in naturally aspirated shield on sample tower.

EEMS Spot Report

Data Compiled: ####################

SiteVisitDate	Site	Technician
08/17/2016	KEF112	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	0.08	c	**P**
2	Temperature max error	P	4	0.5	12	0.18	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98447	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.27377	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.3	%	**P**
7	Ozone % difference max	P	7	10	4	2.2	%	**P**
8	Flow Rate average % difference	P	10	5	4	1.62	%	**P**
9	Flow Rate max % difference	P	10	5	4	1.71	%	**P**
10	DAS Time maximum error	P	0	5	1	0.07	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.56	c	**P**
13	Shelter Temperature max error	P	5	2	12	0.75	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	49			
2	Shelter Temperature standard deviation		5	0	12			
3	Temperature standard deviation		4	0	12			

SiteVisitDate	Site	Technician
08/17/2016	KEF112	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:** SiteOpsProcedures

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

2 **Parameter:** SitingCriteriaCom

The site is in a clearing within the Kane Experimental Forest, the tree line is within 10 meters of the site.

3 **Parameter:** ShelterCleanNotes

The shelter is clean and very well organized. The floor and bottom of walls are beginning to deteriorate.

4 **Parameter:** PollAnalyzerCom

Trees to the east are within 20 meters of the ozone inlet.

5 **Parameter:** MetSensorComme

The meteorological tower is attached to the shelter and the temperature sensor is positioned directly over the metal roof of the shelter.

EEMS Spot Report

Data Compiled: 10/15/2016 6:00:48 PM

SiteVisitDate	Site	Technician
08/23/2016	LRL117	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	0.97730	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.56697	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.2	%	**P**
5	Ozone % difference max	P	7	10	4	2.0	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: ####################

SiteVisitDate	Site	Technician
08/15/2016	MKG113	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	0.04	c	**P**
2	Temperature max error	P	4	0.5	3	0.06	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00272	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.79901	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.0	%	**P**
7	Ozone % difference max	P	7	10	4	2.0	%	**P**
8	Flow Rate average % difference	P	10	5	3	0.22	%	**P**
9	Flow Rate max % difference	P	10	5	3	0.67	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.07	c	**P**
13	Shelter Temperature max error	P	5	2	12	0.13	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	49			
2	Shelter Temperature standard deviation		5	0	12			
3	Temperature standard deviation		4	0	3			

SiteVisitDate	Site	Technician
08/15/2016	MKG113	Sandy Grenville

Field Systems Comments

1 **Parameter:** DasComments

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

2 **Parameter:** ShelterCleanNotes

The shelter is clean and organized. Leak and rot below the air conditioner and on the floor under the counter. Mold beginning on walls and floor.

EEMS Spot Report

Data Compiled: 10/20/2016 9:58:36 PM

SiteVisitDate	Site	Technician
08/24/2016	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	0.97977	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.18790	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.7	%	**P**
5	Ozone % difference max	P	7	10	4	2.3	%	**P**

Records without valid pass/fail criteria

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell B Freq. **CommentCode:** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

EEMS Spot Report

Data Compiled: 9/4/2016 6:07:02 PM

SiteVisitDate	Site	Technician
09/01/2016	PRK134	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.95671	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.02669	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	4.2	%	**P**
5	Ozone % difference max	P	7	10	4	4.7	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: ####################

SiteVisitDate	Site	Technician
08/22/2016	PSU106	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	0.27	c	**P**
2	Temperature max error	P	4	0.5	9	0.33	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98609	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.18438	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.0	%	**P**
7	Ozone % difference max	P	7	10	4	1.2	%	**P**
8	Flow Rate average % difference	P	10	5	4	0.66	%	**P**
9	Flow Rate max % difference	P	10	5	4	0.66	%	**P**
10	DAS Time maximum error	P	0	5	1	0.08	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.36	c	**P**
13	Shelter Temperature max error	P	5	2	12	0.51	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	49			
2	Shelter Temperature standard deviation		5	0	12			
3	Temperature standard deviation		4	0	9			

SiteVisitDate	Site	Technician
08/22/2016	PSU106	Sandy Grenville

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator uses the filter bag as a glove when handling the filter pack.

2 **Parameter:** DasComments

The meteorological tower has been removed.

3 **Parameter:** SitingCriteriaCom

The site is within 10 km of State College which has a population of approximately 50,000. The site is located in a university agricultural research field.

4 **Parameter:** ShelterCleanNotes

The shelter is owned by the university and is clean and orderly. The site is part of the Surfrad network.

5 **Parameter:** MetOpMaintCom

The 10-meter temperature sensor is now mounted in a naturally aspirated shield on the sample tower.

EEMS Spot Report

Data Compiled: 9/4/2016 6:38:21 PM

SiteVisitDate	Site	Technician
08/30/2016	RED004	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.07	c	**P**
2	Temperature max error	P	4	0.5	6	0.18	c	**P**
3	Flow Rate average % difference	P	10	5	3	0.00	%	**P**
4	Flow Rate max % difference	P	10	5	3	0.00	%	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature standard deviation		4	0	6			

SiteVisitDate	Site	Technician
08/30/2016	RED004	Eric Hebert

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** DocumentationCo

There is no site logbook and all manuals are kept electronically since the site is a small footprint site with no place to store hardcopies.

2 **Parameter:** SitingCriteriaCom

The site was cleared when installed, however the underbrush is beginning to grow near the tower.

3 **Parameter:** ShelterCleanNotes

Small footprint site with enclosure for instruments only. No shelter.

EEMS Spot Report

Data Compiled: 7/27/2016 4:09:06 PM

SiteVisitDate	Site	Technician
07/19/2016	SAL133	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	6	0.10	c	**P**
2	Temperature max error	P	4	0.5	6	0.16	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98516	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.28944	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	1.5	%	**P**
8	Flow Rate average % difference	P	10	5	3	1.75	%	**P**
9	Flow Rate max % difference	P	10	5	3	1.96	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.46	c	**P**
13	Shelter Temperature max error	P	5	2	12	0.79	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	49			
2	Shelter Temperature standard deviation		5	0	12			
3	Temperature standard deviation		4	0	6			

SiteVisitDate	Site	Technician
07/19/2016	SAL133	Sandy Grenville

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

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

2 **Parameter:** SitingCriteriaCom

The site is located next to a field usually planted with corn or soy beans.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition and there is evidence of a leak in the shelter roof and ants are present. It is clean, neat, and well organized. Only one light is working.

EEMS Spot Report

Data Compiled: 10/15/2016 6:21:20 PM

SiteVisitDate	Site	Technician
09/09/2016	SAN189	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99074	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.92556	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99994	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.8	%	**P**
5	Ozone % difference max	P	7	10	4	4.0	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 7/27/2016 4:26:16 PM

SiteVisitDate	Site	Technician
07/20/2016	STK138	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	0.97109	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.68618	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.4	%	**P**
5	Ozone % difference max	P	7	10	4	2.4	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 9/4/2016 3:40:15 PM

SiteVisitDate	Site	Technician
08/16/2016	UVL124	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	12	0.04	c	**P**
2	Temperature max error	P	4	0.5	12	0.08	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00000	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.57786	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.1	%	**P**
7	Ozone % difference max	P	7	10	4	2.9	%	**P**
8	Flow Rate average % difference	P	10	5	3	0.44	%	**P**
9	Flow Rate max % difference	P	10	5	3	0.67	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	8	0.57	c	**P**
13	Shelter Temperature max error	P	5	2	8	0.60	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	49			
2	Shelter Temperature standard deviation		5	0	8			
3	Temperature standard deviation		4	0	12			

SiteVisitDate	Site	Technician
08/16/2016	UVL124	Eric Hebert

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

Ozone sample train leak-check performed every two weeks.

2 **Parameter:** DocumentationCo

The ozone diagnostic and observation sections of the SSRF were completed during the filter removal visit and not the installation visit as indicated on the form. This was noted during the previous audit visit. It was discussed with the site operator who indicated she would be recording the information on the correct date.

3 **Parameter:** SitingCriteriaCom

The site is located in an active agriculture field usually planted with beans or corn.

4 **Parameter:** ShelterCleanNotes

The shelter is clean and in good condition.

5 **Parameter:** MetOpMaintCom

Met tower removed and temperature mounted in naturally aspirated shield on sample tower.

EEMS Spot Report

Data Compiled: 7/27/2016 4:43:47 PM

SiteVisitDate	Site	Technician
07/22/2016	VIN140	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	0.98104	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.18851	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.5	%	**P**
5	Ozone % difference max	P	7	10	4	4.4	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 9/4/2016 5:47:39 PM

SiteVisitDate	Site	Technician
08/29/2016	VOY413	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.97748	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.57243	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99994	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.1	%	**P**
5	Ozone % difference max	P	7	10	4	2.2	%	**P**

Records without valid pass/fail criteria

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell A Freq. **CommentCode:** 99

This analyzer diagnostic check is outside the manufacturer's recommended value.

EEMS Spot Report

Data Compiled: ####################

SiteVisitDate	Site	Technician
09/15/2016	WST109	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	6	0.11	c	**P**
2	Temperature max error	P	4	0.5	6	0.21	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99396	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.48937	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.2	%	**P**
7	Ozone % difference max	P	7	10	4	0.3	%	**P**
8	Flow Rate average % difference	P	10	5	6	1.92	%	**P**
9	Flow Rate max % difference	P	10	5	6	2.11	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.67	c	**P**
13	Shelter Temperature max error	P	5	2	12	1.08	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	49			
2	Shelter Temperature standard deviation		5	0	12			
3	Temperature standard deviation		4	0	6			

SiteVisitDate	Site	Technician
09/15/2016	WST109	Sandy Grenville

Field Systems Comments

1 **Parameter:** DasComments

The sample tower has been replaced and the met tower removed since the previous audit visit.

2 **Parameter:** SiteOpsProcedures

Ozone sample train leak checks are being conducted every two weeks.

3 **Parameter:** SitingCriteriaCom

The site is in a small clearing surrounded by mountain forest. There is a small parking lot used by forest service employees located 50 meters from the site.

4 **Parameter:** SiteOKNotes

State of NH Department of Environmental Services contact is Tom Fazzina (603) 271-0911 and tfazzina@DES.state.NH.US

5 **Parameter:** MetSensorComme

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

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
STK138-Sandy Grenville-07/20/2016						
1	7/20/2016	DAS	Campbell	000349	CR3000	2128
2	7/20/2016	Ozone	ThermoElectron Inc	000743	49i A1NAA	1105347321
3	7/20/2016	Ozone Standard	ThermoElectron Inc	000687	49i A3NAA	1030244809
4	7/20/2016	Zero air pump	Werther International	06915	C 70/4	000829162

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347321	STK138	Sandy Grenville	07/20/2016	Ozone	000743

Slope:	0.97109	**Slope:**	0.00000
Intercept	0.68618	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.4%	2.4%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.02	0.35	0.77	ppb	
primary	2	30.02	30.49	30.50	ppb	0.03%
primary	3	50.03	50.60	50.04	ppb	-1.11%
primary	4	80.02	80.73	79.04	ppb	-2.09%
primary	5	109.89	110.74	108.10	ppb	-2.38%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.50	pass
Span	0.997	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	98.9 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	709.4 mmHg	pass
Cell A Tmp.	36.5 C	pass
Cell B Freq.	91.5 kHz	pass
Cell B Noise	0.3 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	710.0 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ALH157-Sandy Grenville-07/21/2016						
1	7/21/2016	DAS	Campbell	000405	CR3000	2522
2	7/21/2016	Ozone	ThermoElectron Inc	000683	49i A1NAA	1030244798
3	7/21/2016	Ozone Standard	ThermoElectron Inc	000440	49i A3NAA	CM08200016
4	7/21/2016	Zero air pump	Werther International	06910	C 70/4	000829160

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244798	ALH157	Sandy Grenville	07/21/2016	Ozone	000683

Slope:	0.97394	**Slope:**	0.00000
Intercept	0.53928	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.6%	2.5%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.02	0.31	0.87	ppb	
primary	2	30.10	30.57	30.20	ppb	-1.21%
primary	3	50.00	50.57	50.10	ppb	-0.93%
primary	4	80.10	80.81	78.82	ppb	-2.46%
primary	5	110.00	110.85	108.70	ppb	-1.94%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.10	pass
Span	0.989	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	97.2 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.64 lpm	pass
Cell A Pressure	722.2 mmHg	pass
Cell A Tmp.	38.4 C	pass
Cell B Freq.	91.6 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	722.2 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
VIN140-Sandy Grenville-07/22/2016						
1	7/22/2016	DAS	Campbell	000358	CR3000	2136
2	7/22/2016	Ozone	ThermoElectron Inc	000630	49i A1NAA	1009241798
3	7/22/2016	Ozone Standard	ThermoElectron Inc	000546	49i A3NAA	0929938239
4	7/22/2016	Zero air pump	Werther International	06906	C 70/4	000821908

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241798	VIN140	Sandy Grenville	07/22/2016	Ozone	000630

Slope:	0.98104	**Slope:**	0.00000
Intercept	-0.18851	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.5%	4.4%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	0.34	0.33	ppb	
primary	2	30.18	30.65	29.31	ppb	-4.37%
primary	3	48.87	49.43	48.62	ppb	-1.64%
primary	4	79.03	79.74	78.23	ppb	-1.89%
primary	5	109.96	110.81	108.40	ppb	-2.17%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.30	pass
Span	1.015	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	91.0 kHz	pass
Cell A Noise	0.3 ppb	pass
Cell A Flow	0.60 lpm	pass
Cell A Pressure	725.3 mmHg	pass
Cell A Tmp.	37.7 C	pass
Cell B Freq.	101.5 kHz	pass
Cell B Noise	0.4 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	725.3 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CNT169-Martin Valvur-08/18/2016						
1	8/18/2016	DAS	Campbell	000417	CR3000	2515
2	8/18/2016	Ozone	ThermoElectron Inc	000699	49i A1NAA	1030244804
3	8/18/2016	Ozone Standard	ThermoElectron Inc	000328	49i A3NAA	0622717850
4	8/18/2016	Zero air pump	Werther International	06925	P 70/4	000836220

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244804	CNT169	Martin Valvur	08/18/2016	Ozone	000699

Slope:	1.07153	**Slope:**	0.00000
Intercept	-0.45958	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
6.4%	6.8%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.04	0.30	-0.27	ppb	
primary	2	27.83	28.14	29.71	ppb	5.58%
primary	3	49.95	50.29	53.56	ppb	6.50%
primary	4	80.05	80.44	85.90	ppb	6.79%
primary	5	111.02	111.47	118.80	ppb	6.58%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.9	pass
Span	1.013	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	103.5 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.58 lpm	pass
Cell A Pressure	505.8 mmHg	pass
Cell A Tmp.	Not tested	pass
Cell B Freq.	101.6 kHz	pass
Cell B Noise	1.7 ppb	pass
Cell B Flow	0.54 lpm	pass
Cell B Pressure	505.8 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
LRL117-Sandy Grenville-08/23/2016						
1	8/23/2016	DAS	Campbell	000344	CR300	2123
2	8/23/2016	Ozone	ThermoElectron Inc	000701	49i A1NAA	1030244808
3	8/23/2016	Ozone Standard	ThermoElectron Inc	000444	49i A3NAA	CM08200020
4	8/23/2016	Zero air pump	Werther International	06904	C 70/4	000821901

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244808	LRL117	Sandy Grenville	08/23/2016	Ozone	000701

Slope:	0.97730	**Slope:**	0.00000
Intercept	0.56697	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99524	**Intercept**	-0.33070
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.2%	2.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.01	0.32	0.80	ppb	
primary	2	30.17	30.64	30.56	ppb	-0.26%
primary	3	49.95	50.52	49.80	ppb	-1.43%
primary	4	80.01	80.72	79.90	ppb	-1.02%
primary	5	109.87	110.72	108.50	ppb	-2.01%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.10	pass
Span	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	112.6 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	698.8 mmHg	pass
Cell A Tmp.	36.6 C	pass
Cell B Freq.	91.6 kHz	Pass
Cell B Noise	1.0 ppb	pass
Cell B Flow	0.83 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
NEC602-Martin Valvur-08/24/2016						
1	8/24/2016	DAS	Campbell	none	CR1000	41007
2	8/24/2016	Ozone	ThermoElectron Inc	none	49i A1NAA	1214552974
3	8/24/2016	Ozone Standard	ThermoElectron Inc	L0534683	49i E3CAA	1214552972
4	8/24/2016	Zero air pump	Thomas	none	107C9818D	049400004418

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1214552974	NEC602	Martin Valvur	08/24/2016	Ozone	none

Slope:	0.97977	**Slope:**	0.00000
Intercept	0.18790	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.7%	2.3%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.35	0.61	0.77	ppb	
primary	2	28.81	29.12	28.45	ppb	-2.30%
primary	3	46.96	47.30	46.60	ppb	-1.48%
primary	4	75.15	75.54	74.80	ppb	-0.98%
primary	5	105.50	105.94	103.60	ppb	-2.21%

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	-0.6	pass
Span	1.026	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	65.2 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	633.6 mmHg	pass
Cell A Tmp.	36.3 C	pass
Cell B Freq.	49.9 kHz	Fail
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	633.3 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo	See comments	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	NEC602	Martin Valvur	08/24/2016	Cell B Freq.	ThermoElectron	3838	☐	☐

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*
VOY413-Eric Hebert-08/29/2016					
1 8/29/2016	DAS	Environmental Sys Corp	none	8816	4059
2 8/29/2016	Ozone	ThermoElectron Inc	90730	49C	49C-70522-366
3 8/29/2016	Ozone Standard	ThermoElectron Inc	90569	49C	49C-59260-322
4 8/29/2016	Sample Tower	Aluma Tower	none	B	AT-51159-11-G
5 8/29/2016	Zero air pump	Twin Tower Engineering	90719	TT70/E4	526294

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-70522-366	VOY413	Eric Hebert	08/29/2016	Ozone	90730

Slope:	0.97748	**Slope:**	0.00000
Intercept	0.57243	**Intercept**	0.00000
CorrCoff	0.99994	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.1%	2.2%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.59	-0.30	0.19	ppb	
primary	2	29.72	29.85	29.56	ppb	-0.97%
primary	3	45.59	45.65	45.27	ppb	-0.83%
primary	4	76.60	76.50	76.03	ppb	-0.61%
primary	5	104.90	104.66	102.40	ppb	-2.16%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.000	pass
Span	1.006	pass
Zero Voltage	0.0002	pass
Fullscale Voltage	1.0003	pass
Cell A Freq.	59.8 kHz	Fail
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.41 lpm	pass
Cell A Pressure	714.3 mmHg	pass
Cell A Tmp.	33.1 C	pass
Cell B Freq.	70.5 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.75 lpm	pass
Cell B Pressure	714.1 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo	See comments	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PRK134-Eric Hebert-09/01/2016						
1	9/1/2016	DAS	Campbell	000411	CR3000	2509
2	9/1/2016	Ozone	ThermoElectron Inc	000690	49i A1NAA	1030244800
3	9/1/2016	Ozone Standard	ThermoElectron Inc	000686	49i A3NAA	1030244818
4	9/1/2016	Sample Tower	Aluma Tower	03518	A	none
5	9/1/2016	UPS	APC	06744	RS900	unknown
6	9/1/2016	Zero air pump	Werther International	06905	C 70/4	000821907

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244800	PRK134	Eric Hebert	09/01/2016	Ozone	000690

Slope:	0.95671	**Slope:**	0.00000
Intercept	-0.02669	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00500	**Intercept**	-0.28841
Cert Date	1/28/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.2%	4.7%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.49	0.77	0.48	ppb	
primary	2	27.84	27.98	26.98	ppb	-3.57%
primary	3	49.65	49.68	47.35	ppb	-4.69%
primary	4	77.55	77.45	74.52	ppb	-3.78%
primary	5	110.89	110.62	105.50	ppb	-4.63%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	Functioning	pass
Offset	-0.40	pass
Span	1.020	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	99.2 kHz	pass
Cell A Noise	1.8 ppb	pass
Cell A Flow	0.65 lpm	pass
Cell A Pressure	710.7 mmHg	pass
Cell A Tmp.	37.0 C	pass
Cell B Freq.	83.4 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.57 lpm	pass
Cell B Pressure	710.7 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SAN189-Martin Valvur-09/09/2016						
1	9/9/2016	DAS	Campbell	000360	CR3000	2138
2	9/9/2016	Ozone	ThermoElectron Inc	000740	49i A1NAA	1105347311
3	9/9/2016	Ozone Standard	ThermoElectron Inc	000367	49i A3NAA	0726124683
4	9/9/2016	Zero air pump	Werther International	06875	C 70/4	000814272

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347311	SAN189	Martin Valvur	09/09/2016	Ozone	000740

Slope:	0.99074	**Slope:**	0.00000
Intercept	-0.92556	**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**
2.8%	4.1%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99832	**Intercept**	-0.26452
Cert Date	1/29/2016	**CorrCoff**	1.00000

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.59	0.85	0.26	ppb	
primary	2	34.53	34.85	33.44	ppb	-4.05%
primary	3	51.63	51.98	50.47	ppb	-2.90%
primary	4	81.05	81.45	79.13	ppb	-2.85%
primary	5	111.45	111.90	110.50	ppb	-1.25%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.10	pass
Span	1.005	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.8 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	690.7 mmHg	pass
Cell A Tmp.	34.0 C	pass
Cell B Freq.	85.2 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	1.44 lpm	pass
Cell B Pressure	690.7 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GRB411-Martin Valvur-09/18/2016						
1	9/18/2016	DAS	Environmental Sys Corp	90635	8816	2507
2	9/18/2016	Ozone	ThermoElectron Inc	90565	49C	49C-59285-322
3	9/18/2016	Ozone Standard	ThermoElectron Inc	none	49C	0330302753
4	9/18/2016	Sample Tower	Aluma Tower	none	B	AT-5381-F9-2
5	9/18/2016	Zero air pump	Werther International	90722	TT70/4E	507782

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	49C-59285-322	GRB411	Martin Valvur	09/18/2016	Ozone	90565

Slope:	0.94866	**Slope:**	0.00000
Intercept	-0.61043	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99953	**Intercept**	-0.18527
Cert Date	9/12/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
6.6%	8.8%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.85	1.03	0.65	ppb	
primary	2	33.07	33.27	30.36	ppb	-8.75%
primary	3	52.32	52.52	49.30	ppb	-6.13%
primary	4	77.74	77.96	73.65	ppb	-5.53%
primary	5	107.44	107.67	101.45	ppb	-5.78%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Dirty	Fail
Battery Backup	N/A	pass
Offset	-0.20	pass
Span	0.998	pass
Zero Voltage	-0.0007	pass
Fullscale Voltage	0.9992	pass
Cell A Freq.	77.1 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	582.2 mmHg	pass
Cell A Tmp.	37.4 C	pass
Cell B Freq.	68.0 kHz	pass
Cell B Noise	2.3 ppb	pass
Cell B Flow	0.65 lpm	pass
Cell B Pressure	582.7 mmHg	pass
Cell B Tmp.		pass
Line Loss	7%	Fail
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BVL130-Eric Hebert-09/24/2016						
1	9/24/2016	DAS	Campbell	000424	CR3000	2539
2	9/24/2016	Ozone	ThermoElectron Inc	000625	49i A1NAA	1009241797
3	9/24/2016	Ozone Standard	ThermoElectron Inc	000512	49i A3NAA	0922236890
4	9/24/2016	Zero air pump	Werther International	06926	PC70/4	000836218

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241797	BVL130	Eric Hebert	09/24/2016	Ozone	000625

Slope:	0.99046	**Slope:**	0.00000
Intercept	-0.34535	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0517112167	**Tfer Desc.**	Ozone primary stan
Tfer ID	01113		
Slope	1.00261	**Intercept**	-0.15202
Cert Date	9/14/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.8%	2.5%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.64	0.78	0.57	ppb	
primary	2	29.19	29.26	28.53	ppb	-2.49%
primary	3	48.38	48.40	47.39	ppb	-2.09%
primary	4	76.01	75.96	75.05	ppb	-1.20%
primary	5	111.34	111.20	109.80	ppb	-1.26%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.40	pass
Span	1.012	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	96.7 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.79 lpm	pass
Cell A Pressure	716.7 mmHg	pass
Cell A Tmp.	34.9 C	pass
Cell B Freq.	100.8 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	716.7 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Site Inventory by Site Visit

	Site Visit Date	Parameter	Mfg	Owner ID	Model Number	Serial Number
GLR468-Martin Valvur-09/26/2016						
1	9/26/2016	DAS	Environmental Sys Corp	90653	8816	2566
2	9/26/2016	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943901
3	9/26/2016	Ozone Standard	ThermoElectron Inc	none	49i A3NAA	0733726104
4	9/26/2016	Zero air pump	Werther International	none	PC70/4	000756725

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1023943901	GLR468	Martin Valvur	09/26/2016	Ozone	none

Slope:	1.07880	**Slope:**	0.00000
Intercept	-0.12526	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	0.99953	**Intercept**	-0.18527
Cert Date	9/12/2016	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
7.7%	8.2%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.50	0.68	0.55	ppb	
primary	2	28.06	28.25	30.40	ppb	7.61%
primary	3	50.01	50.21	54.30	ppb	8.15%
primary	4	81.04	81.26	87.09	ppb	7.17%
primary	5	111.03	111.26	120.10	ppb	7.95%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.4	pass
Span	1.017	pass
Zero Voltage	-0.0010	pass
Fullscale Voltage	0.9989	pass
Cell A Freq.	72.3 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.54 lpm	pass
Cell A Pressure	678.3 mmHg	pass
Cell A Tmp.	33.7 C	pass
Cell B Freq.	66.5 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.53 lpm	pass
Cell B Pressure	678.3 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass