2018 – 3rd Quarter Report

Support for Conducting Systems & Performance Audits of Clean Air Status and Trends Network (CASTNET) Sites and National Atmospheric Deposition Program (NADP) Monitoring Stations - II

EPA Contract No. EP-W-18-005

Prepared for:

U. S. Environmental Protection Agency

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List of Acronyms and Abbreviations

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

1.0 CASTNET Quarterly Report

1.1 Introduction

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

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

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

As of October 2018, the network is comprised of 95 active rural sampling sites across the United States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment and Climate Change Canada (ECCC), Bureau of Land Management – Wyoming State Office (BLM-WSO) and several independent partners. Wood is responsible for operating the EPA and ECCC sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS and BLM-WSO sponsored sites.

1.2 Project Objectives

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

Performance audits verify that all evaluated variables are consistent with the accuracy goals as defined in the CASTNET Quality Assurance Project Plan (QAPP). The parameter specific accuracy goals are presented in Table 1. Six EPA sponsored sites that are operated by Wood continue to operate meteorological sensors. Those sites are BEL116, BVL130, CHE185, IRL141, PAL190, and PND165. Five sites sponsored by BLM-WSO also operate meteorological sensors. The NPS operates meteorological sensors at many of their air quality monitoring sites. The meteorological sensors at one NPS CASTNET site (CHC432) were audited during this reporting period.

Some or all of the additional monitored variables, NOy, CO, and SO_2 have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, GRS420, MAC426, and ROM206. Those variables at sites ROM206, PND165, and HWF187 were audited during this reporting period. Results of those audits were distributed immediately following the performance evaluations.

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

Sensor	Parameter	Audit Challenge	Acceptance Criteria
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
Mass Flow Controller	Flow Rate	Comparison with Primary Standard	≤ ± 5.0% of designated rate
Ozone	Slope	Linear regression of multi-point test gas concentration as measured with a certified transfer standard	0.9000 ≤ m ≤ 1.1000
Ozone	Intercept		-5.0 ppb ≤ b ≤ 5.0 ppb
Ozone	Correlation Coefficient		0.9950 ≤ r
Ozone	Percent Difference	Comparison with Level 2 standard concentration	≤ ±15.1% of test gas concentration
DAS	Accuracy	Comparison with certified standard	≤ ± 0.003 VDC

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

Site systems audits are intended to provide a qualitative appraisal of the total measurement system. Site planning, organization, and operation are evaluated to ensure that good Quality Assurance/Quality Control (QA/QC) practices are being applied. At a minimum the following audit issues were addressed at each site systems audit:

- Site locations and configurations match those provided in the CASTNET QAPP.
- Meteorological instruments are in good physical and operational condition and are sited to meet EPA ambient monitoring guidelines (EPA-600/4-82-060).
- Sites are accessible, orderly, and if applicable, compliant with OSHA safety standards.
- Sampling lines are free of leaks, kinks, visible contamination, weathering, and moisture.
- Site shelters provide adequate temperature control.
- All ambient air quality instruments are functional, being operated in the appropriate range, and the zero air supply desiccant is unsaturated.
- All instruments are in current calibration.
- Site documentation (maintenance schedules, on-site SOPs, etc.) is current and log book records are complete.
- All maintenance and on-site SOPs are performed on schedule.

- Corrective actions are documented and appropriate for required maintenance/repair activity.
- Site operators demonstrate an adequate knowledge and ability to perform required site activities, including documentation and maintenance activities.

1.3 CASTNET Sites Visited Third Quarter 2018

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

Table 2. Site Audit Visits

Side ID	Audit Type	Sponsor	Site Visit Date	Station Name
NPT006	FSA+Flow	EPA	7/3/2018	Nez Perce Tribe
CHC432	Met	NPS	8/6/2018	Chaco NHP
MEV405	FSA+Flow	NPS	8/7/2018	Mesa Verde NP
ARE128	FSA+Flow	EPA	8/18/2018	Arendtsville
MKG113	FSA+Flow	EPA	8/20/2018	M. K. Goddard St. Park
PSU106	FSA+Flow	EPA	8/20/2018	Penn State University
KEF112	FSA+Flow	EPA	8/21/2018	Kane Experimental Forest
ANA115	FSA+Flow	EPA	9/10/2018	Ann Arbor
UVL124	FSA+Flow	EPA	9/12/2018	Unionville
HOX148	FSA+Flow	EPA	9/13/2018	Hoxeyville
CTH110	FSA+Flow	EPA	9/25/2018	Connecticut Hill
HWF187	FSA+Flow	EPA	9/30/2018	Huntington Wildlife Forest

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
NPT006	O_3	EPA	7/3/2018	Nez Perce Tribe
YEL408	O_3	NPS	7/5/2018	Yellowstone NP
GLR468	O_3	NPS	7/6/2018	Glacier NP
PND165	O_3	EPA+WSO	7/23/2018	Pinedale
PND165	NOy	EPA+WSO	7/24/2018	Pinedale
PED108	O_3	EPA	7/30/2018	Prince Edward
VPI120	O_3	EPA	7/31/2018	Horton Station
PAR107	O_3	EPA	8/1/2018	Parsons
CKT136	O_3	EPA	8/2/2018	Crockett
MCK131	O_3	EPA	8/3/2018	Mackville
MCK231	O_3	EPA	8/4/2018	Mackville
CHC432	O_3	NPS	8/6/2018	Chaco NHP
MEV405	O_3	NPS	8/7/2018	Mesa Verde NP
ARE128	O_3	EPA	8/18/2018	Arendtsville
CDR119	O_3	EPA	8/18/2018	Cedar Creek St. Park
MKG113	O_3	EPA	8/20/2018	M. K. Goddard St. Park
PSU106	O_3	EPA	8/20/2018	Penn State University

Side ID	PE Audit Type	Sponsor	Site Visit Date	Station Name
ROM206	NOy	EPA	8/20/2018	Rocky Mountain NP
KEF112	O_3	EPA	8/21/2018	Kane Experimental Forest
CNT169	O_3	EPA	8/30/2018	Centennial
ANA115	O_3	EPA	9/10/2018	Ann Arbor
UVL124	O_3	EPA	9/12/2018	Unionville
HOX148	O_3	EPA	9/13/2018	Hoxeyville
PRK134	O_3	EPA	9/17/2018	Perkinstown
CTH110	O_3	EPA	9/25/2018	Connecticut Hill
CRMO-VC	O_3	NPS	9/27/2018	Craters of the Moon
HWF187	O_3+NOy	EPA	9/30/2018	Huntington Wildlife Forest

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 3 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 120 stations. The MDN began operation in 1996 and includes sites throughout the US and Canada. The Atmospheric Mercury Network (AMNet) and the Ammonia Monitoring Network (AMoN) measure ambient concentrations of mercury and ammonia, respectively.

The NADP and other long-term monitoring networks provide critical information to the EPA regarding evaluating the effectiveness of emission reduction control programs from the power industry.

The NADP Program Office (PO) operates and administers the three precipitation chemistry networks (NTN, MDN and AIRMoN), two atmospheric concentration networks (AMNet and AMoN), two analytical laboratories, the Wisconsin State Lab of Hygiene (WSLH) located at the University of Wisconsin in Madison 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 NADP Sites Visited Third Quarter 2018

This report presents the NADP sites surveyed during the third quarter (July through September) of 2018. The station names and dates of the surveys are presented in Table 4.

Table 4. Sites Surveyed – Third Quarter 2018

Side ID	Network	Visit Date	Station Name
AB32	NTN	9/7/2018	Fort Mackay
CO02	NTN	7/31/2018	Niwot Saddle
CO08	NTN	8/10/2018	Four Mile Park
CO88	AMoN	8/20/2018	Rocky Mountain Np
CO91	NTN	8/8/2018	Wolf Creek Pass
CO92	NTN	8/10/2018	Sunlight Peak
CO96	MDN / NTN	8/9/2018	Molas Pass
CO98	NTN	8/14/2018	Rocky Mountain Np-Loch Vale
CO99	MDN / NTN	8/7/2018	Mesa Verde National Park-Chapin Mesa
ID03	AMoN	9/27/2018	Craters of the Moon National Monument
ID07	AMoN	7/3/2018	Nez Perce Tribe
KY03	AMoN	8/4/2018	Mackville
MI09	MDN/NTN	9/14/2018	Douglas Lake
MI26	NTN	9/11/2018	Kellog Biological Station
MI48	MDN/NTN	9/15/2018	Seney National Wildlife Refuge-Headquarters
MI51	NTN/AMoN	9/12/2018	Unionville
MI52	AMoN	9/10/2018	Ann Arbor
MI53	NTN	9/11/2018	Wellston
MI95	AMoN	9/13/2018	Hoxeyville
MT00	NTN	9/11/2018	Little Bighorn Battlefield National Monument
MT96	NTN	7/17/2018	Poplar River
MT98	NTN	7/18/2018	Havre-Northern Agriculture Research Center
ND01	MDN	7/16/2018	Lostwood National Wildlife Refuge

Side ID	Network	Visit Date	Station Name
NY67	AMoN	9/26/2018	Ithaca
PA00	AMoN	8/18/2018	Arendtsville
PA29	AMoN	8/21/2018	Kane Experimental Forest
PA56	AMoN	8/20/2018	M. K. Goddard St. Park
PA96	AMoN	8/22/2018	Penn State University
SK20	NTN	9/10/2018	Cactus Lake
SK21	NTN	9/5/2018	Hudson Bay
SK27	MDN/AMoN	9/6/2018	Pinehouse
SK30	NTN	9/4/2018	Weyburn
SK31	NTN	9/9/2018	Fox Valley
VA13	AMoN	7/31/2018	Horton Station
VA24	AMoN	7/30/2018	Prince Edward
WA24	NTN	7/2/2018	Palouse Conservation Farm
WI10	MDN/NTN	9/17/2018	Potawatomi
WI31	MDN	9/18/2018	Devil's Lake
WI35	AMoN	9/17/2018	Perkinstown
WV05	AMoN	8/1/2018	Cedar Creek State Park
WV18	AMoN	8/1/2018	Parsons
WY00	NTN	8/28/2018	Snowy Range
WY02	NTN	7/26/2018	Sinks Canyon
WY06	NTN/AMoN	7/24/2018	Pinedale
WY94	NTN / AMoN	7/23/2018	Grand Tetons National Park
WY95	NTN / AMoN	8/28/2018	Brooklyn Lake
WY97	NTN	7/26/2018	South Pass City

Side ID	Network	Visit Date	Station Name
WY97	NTN	9/28/2018	South Pass City
WY98	NTN	7/24/2018	Gypsum Creek

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*
NPT006-Martin Valvur-07/03/2018						
1	7/3/2018	Computer	Dell	07065	Inspiron 15	1Y3MC12
2	7/3/2018	DAS	Campbell	none	CR850	28381
3	7/3/2018	DAS	Campbell	000353	CR3000	2131
4	7/3/2018	Filter pack flow pump	Permotec	none	BL30EB	432201630446
5	7/3/2018	Flow Rate	Apex	00854	AXMC105LPMDPCV	illegible
6	7/3/2018	Modem	Sierra wireless	06990	GX440	Unknown
7	7/3/2018	Ozone	ThermoElectron Inc	000612	49i A1NAA	1009241779
8	7/3/2018	Ozone Standard	ThermoElectron Inc	000448	49i A3NAA	CM08200024
9	7/3/2018	Sample Tower	Aluma Tower	000839	AT516D1	AT214153Z12
10	7/3/2018	Shelter Temperature	Campbell	none	107-L	none
11	7/3/2018	Temperature	RM Young	04681	41342VC	6695
12	7/3/2018	Zero air pump	Werther International	000626	PC 70/4	000815300

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	NPT006	Martin Valvur	07/03/2018	Flow Rate	00854

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
1.66%	2.04%			**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	0.00	0.000	0.00	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	3.003	2.950	2.94	0.000	2.99	l/m	l/m	1.36%
primary	test pt 2	3.005	2.950	2.94	0.000	3.00	l/m	l/m	1.59%
primary	test pt 3	3.002	2.940	2.95	0.000	3.00	l/m	l/m	2.04%

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**	4.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	190 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241779	NPT006	Martin Valvur	07/03/2018	Ozone	000612

Slope:	1.04884	**Slope:**	0.00000
Intercept	-0.23783	**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	1.00801	**Intercept**	-0.05199
Cert Date	9/11/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
4.0%	4.9%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.02	0.03	-0.25	ppb	
primary	2	14.03	13.97	14.67	ppb	3.09%
primary	3	33.01	32.79	34.18	ppb	4.24%
primary	4	65.98	65.50	68.12	ppb	4.00%
primary	5	111.00	110.16	115.50	ppb	4.85%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.1	pass
Span	1.019	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	101 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	660.2 mmHg	pass
Cell A Tmp.	35.8 C	pass
Cell B Freq.	96.2 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	660.2 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	6695	NPT006	Martin Valvur	07/03/2018	Temperature	04681

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.25	0.28		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.18	0.20	0.000	0.0	C	-0.23
primary	Temp Mid Range	24.60	24.62	0.000	24.3	C	-0.28
primary	Temp High Range	46.88	46.91	0.000	46.7	C	-0.25

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	NPT006	Martin Valvur	07/03/2018	Shelter Temperature	none

DAS 1:

Abs Avg Err	Abs Max Er
0.37	0.47

DAS 2:

Abs Avg Err	Abs Max Er

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.48	24.50	0.000	25.0	C	0.47
primary	Temp Mid Range	25.03	25.05	0.000	24.9	C	-0.18
primary	Temp Mid Range	26.15	26.17	0.000	26.6	C	0.46

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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

Site is located in wooded mountainous area.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	NPT006	**Technician**	Martin Valvur	**Site Visit Date**	07/03/2018

Site Sponsor (agency)	EPA	**USGS Map**	
Operating Group	Nez Perce Tribe	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**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**	46.276031
Site Address 1		**Audit Longitude**	-116.020137
Site Address 2		**Audit Elevation**	965
County	Idaho	**Audit Declination**	14.0
City, State	Kamiah, ID		
Zip Code	83536		**Present**
Time Zone	Pacific	**Fire Extinguisher** ☑	In vehicle
Primary Operator		**First Aid Kit** ☑	In vehicle
Primary Op. Phone #		**Safety Glasses** ☐	
Primary Op. E-mail		**Safety Hard Hat** ☐	
Backup Operator		**Climbing Belt** ☐	
Backup Op. Phone #		**Security Fence** ☑	
Backup Op. E-mail		**Secure Shelter** ☑	
		Stable Entry Step ☑	

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

Driving Directions From the town of Kamiah, travel east on route 12. immediately after crossing the Clearwater river, turn left onto Woodland drive. Travel approximately 7 miles on Woodland Dr and look for the road leading to the 140 foot tower.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID NPT006 **Technician** Martin Valvur **Site Visit Date** 07/03/2018

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

Siting Distances OK ☑

Siting Criteria Comment

Site is located in wooded mountainous area.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	NPT006	Technician	Martin Valvur	Site Visit Date	07/03/2018

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	NPT006	Technician	Martin Valvur	Site Visit Date	07/03/2018

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	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 NPT006 **Technician** Martin Valvur **Site Visit Date** 07/03/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 10 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	

Provide any additional 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 NPT006 **Technician** Martin Valvur **Site Visit Date** 07/03/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☐	
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 NPT006 **Technician** Martin Valvur **Site Visit Date** 07/03/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

1	Is the station log properly completed during every site visit?	☑	
2	Are the Site Status Report Forms being completed and current?	☑	
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	NPT006	Technician	Martin Valvur	Site Visit Date	07/03/2018

Site operation procedures

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

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	Semiannually	☑
Visual Inspections	☑	Weekly	☑
Translator Zero/Span Tests (climatronics)	☐	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	☐	N/A	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐	N/A	☑
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

Provide any additional 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 NPT006 **Technician** Martin Valvur **Site Visit Date** 07/03/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook
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 NPT006 **Technician** Martin Valvur **Site Visit Date** 07/03/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	1Y3MC12	07065
DAS	Campbell	CR3000	2131	000353
DAS	Campbell	CR850	28381	none
Filter pack flow pump	Permotec	BL30EB	432201630446	none
Flow Rate	Apex	AXMC105LPMDPC	illegible	00854
Modem	Sierra wireless	GX440	Unknown	06990
Ozone	ThermoElectron Inc	49i A1NAA	1009241779	000612
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200024	000448
Sample Tower	Aluma Tower	AT516D1	AT214153Z12	000839
Shelter Temperature	Campbell	107-L	none	none
Temperature	RM Young	41342VC	6695	04681
Zero air pump	Werther International	PC 70/4	000815300	000626

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CHC432-Martin Valvur-08/06/2018						
1	8/6/2018	Computer	Hewlett Packard	none	ProBook	5CG5340VRK
2	8/6/2018	DAS	Environmental Sys Corp	none	8832	A4871K
3	8/6/2018	elevation	Elevation	none	none	none
4	8/6/2018	Infrastructure	Infrastructure	none	none	none
5	8/6/2018	Modem	CradlePoint	none	unknown	unknown
6	8/6/2018	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460049
7	8/6/2018	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	1152780006
8	8/6/2018	Precipitation	Texas Electronics	none	TR-525i-HT	64172-315
9	8/6/2018	Relative Humidity	Vaisala	none	HMP45AC	21730143
10	8/6/2018	Sample Tower	Aluma Tower	none	FOT-10	Unknown
11	8/6/2018	Shelter Temperature	ARS	none	unknown	none
12	8/6/2018	siting criteria	Siting Criteria	none	none	None
13	8/6/2018	Solar Radiation	Licor	none	Pyranometer	PY16747
14	8/6/2018	Temperature2meter	Vaisala	none	HMP45AC	21730143
15	8/6/2018	Wind Direction	RM Young	none	AQ05305	54831wdr
16	8/6/2018	Wind Speed	RM Young	none	AQ05305	54831wsp
17	8/6/2018	Zero air pump	Werther International	none	P 70/4	000756726

DAS Data Form

DAS Time Max Error: 0.6

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A4871K	CHC432	Martin Valvur	08/06/2018	DAS	Primary

Das Date: 8 /6 /2018
Das Time: 9:14:30
Das Day: 218

Audit Date 8 /6 /2018
Audit Time 9:15:06
Audit Day 218

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0004	0.0008	0.0004	0.0008

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
9	0.0000	-0.0011	-0.0012	V	V	-0.0001
9	0.1000	0.0999	0.1000	V	V	0.0001
9	0.3000	0.3995	0.3996	V	V	0.0001
9	0.5000	0.4992	0.5000	V	V	0.0008
9	0.7000	0.6998	0.6998	V	V	0.0000
9	0.9000	0.8998	0.9005	V	V	0.0007
9	1.0000	0.9997	1.0004	V	V	0.0007

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460049	CHC432	Martin Valvur	08/06/2018	Ozone	none

Slope:	1.00902	**Slope:**	0.00000
Intercept	-0.06102	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.13	0.18	0.23	ppb		0.05
primary	2	16.35	16.27	16.24	ppb		-0.03
primary	3	37.69	37.44	37.78	ppb	0.9	
primary	4	67.00	66.51	66.91	ppb	0.6	
primary	5	107.02	106.22	107.20	ppb	0.92	

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	0.995	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	64.6 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.64 lpm	pass
Cell A Pressure	595.1 mmHg	pass
Cell A Tmp.	34.9 C	pass
Cell B Freq.	84.4 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.64 lpm	pass
Cell B Pressure	594.5 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Wind Speed Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	54831wsp	CHC432	Martin Valvur	08/06/2018	Wind Speed	none

Mfg	RM Young	**Parameter**	wind speed
Serial Number	CA4353	**Tfer Desc.**	wind speed motor (h
Tfer ID	01457		
Slope	1.00000	**Intercept**	0.00000
Cert Date	4/19/2018	**CorrCoff**	1.00000

Prop or Cups SN 76717
Prop or Cups Torque 0.3 **to** 0.3
Prop Correction Fact 0.0512

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.05	0.09%		
Abs Max Er	0.20	0.16%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary		0	0.20	0.0	0.0		-0.20	
primary		200	1.02	0.0	1.0		0.00	
primary		400	2.05	0.0	2.1		0.00	
primary		800	4.10	0.0	4.1		0.00	
primary		1200	6.14	0.0	6.2	0.16%		
primary		2400	12.29	0.0	12.3	0.08%		
primary		4000	20.48	0.0	20.5	0.05%		
primary		9400	48.13	0.0	48.2	0.06%		

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Prop or Cups Condition	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Wind Direction Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	54831wdr	CHC432	Martin Valvur	08/06/2018	Wind Direction	none

Mfg	RM Young	**Parameter**	wind direction
Serial Number		**Tfer Desc.**	wind direction wheel
Tfer ID	01266		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/1/2006	**CorrCoff**	1.00000

Mfg	RM Young	**Parameter**	wind direction
Serial Number	None	**Tfer Desc.**	wind direction wheel
Tfer ID	01252		

Mfg	Ushikata	**Parameter**	wind direction
Serial Number	190037	**Tfer Desc.**	transit
Tfer ID	01265		
Slope	1.00000	**Intercept**	0.00000
Cert Date	3/5/2018	**CorrCoff**	1.00000

Vane SN: N/A **C. A. Align. deg. true:** 180

VaneTorque 5 to 5

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	2.0	1.0		
Abs Max Er	4	3		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01266	0	☑	0.0000	0	0	46	1
primary	01266	45	☑	0.0000	42	3	42	-3
primary	01266	90	☑	0.0000	86	4	44	-1
primary	01266	135	☑	0.0000	131	4	45	0
primary	01266	180	☑	0.0000	178	2	47	2
primary	01266	225	☑	0.0000	223	2	45	0
primary	01266	270	☑	0.0000	269	1	46	1
primary	01266	315	☑	0.0000	314	1	45	0
primary	01265	90	☐	0.0000	86	4		4
primary	01265	180	☐	0.0000	177	3		3
primary	01265	270	☐	0.0000	269	1		1
primary	01265	360	☐	0.0000	0	0		0

Sensor Component	Condition	**Condition**	Good	**Status**	pass
Sensor Component	Mast	**Condition**	Good	**Status**	pass
Sensor Component	Sensor Heater	**Condition**	N/A	**Status**	pass
Sensor Component	Sensor Plumb	**Condition**	Plumb	**Status**	pass

Sensor Component	Torque	**Condition**		**Status**	pass
Sensor Component	Vane Condition	**Condition**	Good	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	21730143	CHC432	Martin Valvur	08/06/2018	Temperature2meter	none

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

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
3.86	5.73		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.44	0.46	0.0000	2.50	C	2.04
primary	Temp Mid Rang	31.30	31.32	0.0000	27.50	C	-3.82
primary	Temp High Rang	45.30	45.33	0.0000	39.60	C	-5.73

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

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	21730143	CHC432	Martin Valvur	08/06/2018	Relative Humidity	none

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	75296	**Tfer Desc.**	GTL
Tfer ID	01220		
Slope	0.95430	**Intercept**	1.78964
Cert Date	2/8/2018	**CorrCoff**	0.99980

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	3.1			
Abs Max Er	4.5			

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	32.7	32.8	0.0000	31.2	-1.6
primary	RH Low Range	GTL	52.9	50.3	52.9	0.0000	48.4	-4.5

Sensor Component	RH Filter	**Condition**	Clean	**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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	PY16747	CHC432	Martin Valvur	08/06/2018	Solar Radiation	none

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	23824	**Tfer Desc.**	SR transfer sensor
Tfer ID	01247		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
0.9%	1.5%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	8/6/2018	8:00	535	535	587	9.6%
primary	8/6/2018	9:00	799	799	773	-3.2%
primary	8/6/2018	10:00	929	929	904	-2.7%
primary	8/6/2018	11:00	1020	1020	995	-2.5%
primary	8/6/2018	12:00	1029	1029	1014	-1.5%

Sensor Component	Sensor Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Sensor Level	**Condition**	Level	**Status**	pass
Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Precipitation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Texas Electronics	64172-315	CHC432	Martin Valvur	08/06/2018	Precipitation	none

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
5.5%	7.3%		

Mfg	PMP	Parameter	Precipitation
Serial Number	None	Tfer Desc.	250ml graduate
Tfer ID	01249		
Slope	1.00000	Intercept	0.00000
Cert Date	4/26/2013	CorrCoff	1.00000

UseDesc.	Test type	TferVolume	Iteration	TimePerTip	Eq.Ht	DAS eng	Eq.HtUnit	OSE Unit	TferUnits	PctDifference
primary	test 1	231.5	1	10 sec	5.50	5.90	mm	mm	ml	7.3%
primary	test 2	231.5	2	10 sec	5.50	5.30	mm	mm	ml	-3.6%

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Installed	Status	pass
Sensor Component	Funnel Clean	Condition	Clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Clean	Status	pass
Sensor Component	Level	Condition	Level	Status	pass
Sensor Component	Sensor Heater	Condition	Not tested	Status	pass
Sensor Component	System Memo	Condition		Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	CHC432	Martin Valvur	08/06/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
3.34	3.51		

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.29	23.31	0.000	26.7	C	3.42
primary	Temp Mid Range	23.58	23.60	0.000	27.1	C	3.51
primary	Temp Mid Range	23.31	23.33	0.000	26.4	C	3.1

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	CHC432	Technician	Martin Valvur	Site Visit Date	08/06/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8812	768 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	N/A	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	N/A	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	N/A	Status	pass
Sensor Component	Sample Train	Condition	N/A	Status	pass

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CHC432	**Technician**	Martin Valvur	**Site Visit Date**	08/06/2018

Site Sponsor (agency)	NPS	**USGS Map**	
Operating Group	NPS	**Map Scale**	
AQS #	35-045-0020	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement		**QAPP Longitude**	
Land Use		**QAPP Elevation Meters**	
Terrain		**QAPP Declination**	
Conforms to MLM		**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	36.034484
Site Address 1		**Audit Longitude**	-107.904275
Site Address 2		**Audit Elevation**	1964
County	San Juan	**Audit Declination**	9.13
City, State	Nageezi, NM		**Present**
Zip Code	87037	**Fire Extinguisher**	☐ Not present
Time Zone	Mountain	**First Aid Kit**	☐ Not present
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐ Not present
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**	8812	**Shelter Size**	768 cuft
Shelter Clean	☑	**Notes**					
Site OK	☑	**Notes**					

Driving Directions

From highway 550 take county road 7950 (dirt road) for 21 miles to the park entrance. Less than one mile from the park entrance look for a gate on the north side of the road. Proceed through the gate for approximately 3 miles on rough dirt road to the top of the mesa.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CHC432 **Technician** Martin Valvur **Site Visit Date** 08/06/2018

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

Siting Distances OK ☑

Siting Criteria Comment

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CHC432	Technician	Martin Valvur	Site Visit Date	08/06/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	
3	Are the tower and sensors plumb?	☑	
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	
8	Is the rain gauge plumb?	☑	
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	
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	CHC432	Technician	Martin Valvur	Site Visit Date	08/06/2018

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

Provide any additional 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	CHC432	Technician	Martin Valvur	Site Visit Date	08/06/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		N/A
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	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?	☐	Not present
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	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-S6-rev002

Site ID CHC432 **Technician** Martin Valvur **Site Visit Date** 08/06/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

1	Do the DAS instruments appear to be in good condition and well maintained?	☑	
2	Are all the components of the DAS operational? (printers, modem, backup, etc)	☑	
3	Do the analyzer and sensor signal leads pass through lightning protection circuitry?	☑	
4	Are the signal connections protected from the weather and well maintained?	☑	
5	Are the signal leads connected to the correct DAS channel?	☑	
6	Are the DAS, sensor translators, and shelter properly grounded?	☑	
7	Does the instrument shelter have a stable power source?	☑	
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 CHC432 **Technician** Martin Valvur **Site Visit Date** 08/06/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	CHC432	Technician	Martin Valvur	Site Visit Date	08/06/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	N/A
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	N/A
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	N/A
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	☑	Every 2 weeks	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☐	Not performed	☑
Analyzer Diagnostics Tests	☑	Alarm values only	☑
In-line Filter Replacement (at inlet)	☑	Every 2 weeks	☑
In-line Filter Replacement (at analyze	☑	N/A	☑
Sample Line Check for Dirt/Water	☑	Every 2 weeks	☑
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?	☑	Electronic copy

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CHC432 **Technician** Martin Valvur **Site Visit Date** 08/06/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	N/A
2	Are the Site Status Report Forms being completed and filed correctly?	☑	N/A
3	Are data downloads and backups being performed as scheduled?	☑	N/A
4	Are general observations being made and recorded? How?	☑	N/A
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	N/A
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	N/A
8	Are filters protected from contamination during handling and shipping? How?	☑	N/A
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

Dry deposition samples are not collected at this CASTNET site.

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

Site ID CHC432 **Technician** Martin Valvur **Site Visit Date** 08/06/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	ProBook	5CG5340VRK	none
DAS	Environmental Sys Corp	8832	A4871K	none
elevation	Elevation	none	none	none
Infrastructure	Infrastructure	none	none	none
Modem	CradlePoint	unknown	unknown	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460049	none
Ozone Standard	ThermoElectron Inc	49i A1NAA	1152780006	none
Precipitation	Texas Electronics	TR-525i-HT	64172-315	none
Relative Humidity	Vaisala	HMP45AC	21730143	none
Sample Tower	Aluma Tower	FOT-10	Unknown	none
Shelter Temperature	ARS	unknown	none	none
siting criteria	Siting Criteria	none	None	none
Solar Radiation	Licor	Pyranometer	PY16747	none
Temperature2meter	Vaisala	HMP45AC	21730143	none
Wind Direction	RM Young	AQ05305	54831wdr	none
Wind Speed	RM Young	AQ05305	54831wsp	none
Zero air pump	Werther International	P 70/4	000756726	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MEV405-Martin Valvur-08/07/2018						
1	8/7/2018	Computer	Hewlett Packard	none	EliteBook	CNV347CS41
2	8/7/2018	DAS	Environmental Sys Corp	90613	8816	2616
3	8/7/2018	Elevation	Elevation	None	1	None
4	8/7/2018	Filter pack flow pump	Thomas	01718	107CA18	00000599
5	8/7/2018	flow rate	Tylan	none	FC280AV-4S	AW9403013
6	8/7/2018	Infrastructure	Infrastructure	none	none	none
7	8/7/2018	MFC power supply	Tylan	none	RO-32	FP9710002
8	8/7/2018	Modem	Sierra wireless	none	GX450	LA54620331001003
9	8/7/2018	Ozone	ThermoElectron Inc	none	49C	0425208058
10	8/7/2018	Ozone Standard	ThermoElectron Inc	90717	49C	49C-66823-354
11	8/7/2018	Sample Tower	Aluma Tower	illegible	B	none
12	8/7/2018	Shelter Temperature	ARS	none	none	none
13	8/7/2018	Siting Criteria	Siting Criteria	None	1	None
14	8/7/2018	Temperature2meter	RM Young	none	41342	15106
15	8/7/2018	Zero air pump	Werther International	none	PC40/4	526289

DAS Data Form

DAS Time Max Error: 0.22

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2616	MEV405	Martin Valvur	08/07/2018	DAS	Primary

Das Date: 8 /7 /2018
Das Time: 12:17:15
Das Day: 219

Audit Date 8 /7 /2018
Audit Time 12:17:28
Audit Day 219

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0003	0.0004	0.0003	0.0004

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
12	0.0000	-0.0005	-0.0006	V	V	-0.0001
12	0.1000	0.0994	0.0992	V	V	-0.0002
12	0.3000	0.2996	0.2993	V	V	-0.0003
12	0.5000	0.4996	0.4993	V	V	-0.0003
12	0.7000	0.6999	0.6997	V	V	-0.0002
12	0.9000	0.8999	0.8996	V	V	-0.0003
12	1.0000	0.9997	0.9993	V	V	-0.0004

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9403013	MEV405	Martin Valvur	08/07/2018	flow rate	none

Mfg	Tylan
SN/Owner ID	FP9710002 none
Parameter	MFC power supply

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

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
3.74%	3.80%			

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	-0.10	0.0000	0.04	l/m	l/m	
primary	leak check	0.000	0.000	-0.08	0.0000	0.08	l/m	l/m	
primary	test pt 1	2.977	2.920	2.69	0.0000	3.03	l/m	l/m	3.80%
primary	test pt 2	2.979	2.920	2.68	0.0000	3.03	l/m	l/m	3.66%
primary	test pt 3	2.981	2.920	2.68	0.0000	3.03	l/m	l/m	3.77%

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**	1.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	0425208058	MEV405	Martin Valvur	08/07/2018	Ozone	none

Slope:	0.98879	**Slope:**	0.00000
Intercept	-2.76421	**Intercept**	0.00000
CorrCoff	0.99885	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.17	0.22	0.48	ppb		0.26
primary	2	14.66	14.59	8.83	ppb		-5.76
primary	3	38.79	38.53	34.41	ppb	-11.3	
primary	4	65.60	65.13	61.78	ppb	-5.28	
primary	5	115.13	114.26	110.80	ppb	-3.07	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Moderately clean	pass
Battery Backup	N/A	pass
Offset	0.30	pass
Span	1.052	pass
Zero Voltage	0.0001	pass
Fullscale Voltage	1.0001	pass
Cell A Freq.	71.3 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.64 lpm	pass
Cell A Pressure	516.0 mmHg	pass
Cell A Tmp.	34.4 C	pass
Cell B Freq.	101.5 kHz	pass
Cell B Noise	1.2 ppb	pass
Cell B Flow	0.54 lpm	pass
Cell B Pressure	515.5 mmHg	pass
Cell B Tmp.		pass
Line Loss		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	15106	MEV405	Martin Valvur	08/07/2018	Temperature2meter	none

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

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.28	0.38		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.73	0.75	0.0000	0.62	C	-0.13
primary	Temp Mid Rang	22.05	22.07	0.0000	22.45	C	0.38
primary	Temp High Rang	47.28	47.31	0.0000	47.65	C	0.34

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	MEV405	Martin Valvur	08/07/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.77	1.80		

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.77	24.79	0.000	23.0	C	-1.8
primary	Temp Mid Range	23.44	23.46	0.000	23.0	C	-0.45
primary	Temp Mid Range	23.35	23.37	0.000	23.3	C	-0.06

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
MEV405	Martin Valvur	08/07/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	888	512 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	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 Data Form

F-02058-1500-S1-rev002

Site ID	MEV405	**Technician**	Martin Valvur	**Site Visit Date**	08/07/2018

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Moccasin Mesa
Operating Group	NPS	**Map Scale**	
AQS #	08-083-0101	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	
Deposition Measurement	dry, wet, IMPROVE	**QAPP Longitude**	
Land Use	woodland - evergreen	**QAPP Elevation Meters**	
Terrain	complex	**QAPP Declination**	
Conforms to MLM	No	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	37.198398
Site Address 1	Natural Resources	**Audit Longitude**	-108.490462
Site Address 2	Mesa Verde National Park	**Audit Elevation**	2170
County	Montezuma	**Audit Declination**	10.3
City, State	Cortez, CO		**Present**
Zip Code	81330	**Fire Extinguisher**	☑ No inspection date
Time Zone	Mountain	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☐
Primary Op. Phone #		**Safety Hard Hat**	☐
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	888	**Shelter Size**	512 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition, clean, and organized.				
Site OK	☑	**Notes**					

Driving Directions From the main entrance on highway 160, go through the park gate and drive about 35 minutes to mile marker 19. Just after mile marker 19 turn right on the paved service road. The air quality office is the stone building about 200 yards down the road. Continue on the same road to the site.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID MEV405 **Technician** Martin Valvur **Site Visit Date** 08/07/2018

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

Siting Distances OK ☐

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	MEV405	Technician	Martin Valvur	Site Visit Date	08/07/2018

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	MEV405	Technician	Martin Valvur	Site Visit Date	08/07/2018

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

Provide any additional 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 MEV405 **Technician** Martin Valvur **Site Visit Date** 08/07/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

There were fires in the area during the audit. There was a larger than normal pressure drop across the ozone sample inlet filter. Some tests were performed that indicated that nearly all ozone loss was due to the sample inlet filter and holder assembly.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID MEV405 **Technician** Martin Valvur **Site Visit Date** 08/07/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID MEV405 **Technician** Martin Valvur **Site Visit Date** 08/07/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID MEV405 **Technician** Martin Valvur **Site Visit Date** 08/07/2018

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☐
Manual Zero/Span Tests	☑	Monthly	☑
Automatic Precision Level Tests	☑	Daily	☐
Manual Precision Level Test	☐		☐
Analyzer Diagnostics Tests	☑	Weekly	☑
In-line Filter Replacement (at inlet)	☑	Monthly	☑
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 MEV405 **Technician** Martin Valvur **Site Visit Date** 08/07/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
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?	☑	Uses bag as glove
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

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

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

Site ID MEV405 **Technician** Martin Valvur **Site Visit Date** 08/07/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	EliteBook	CNV347CS41	none
DAS	Environmental Sys Corp	8816	2616	90613
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	00000599	01718
flow rate	Tylan	FC280AV-4S	AW9403013	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9710002	none
Modem	Sierra wireless	GX450	LA54620331001003	none
Ozone	ThermoElectron Inc	49C	0425208058	none
Ozone Standard	ThermoElectron Inc	49C	49C-66823-354	90717
Sample Tower	Aluma Tower	B	none	illegible
Shelter Temperature	ARS	none	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature2meter	RM Young	41342	15106	none
Zero air pump	Werther International	PC40/4	526289	none

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ARE128-Sandy Grenville-08/18/2018						
1	8/18/2018	Computer	Dell	07045	Inspiron 15	Unknown
2	8/18/2018	DAS	Campbell	000400	CR3000	2524
3	8/18/2018	Elevation	Elevation	None	1	None
4	8/18/2018	Filter pack flow pump	Thomas	02661	107CA110	000012187C
5	8/18/2018	Flow Rate	Apex	000462	AXMC105LPMDPCV	42228
6	8/18/2018	Infrastructure	Infrastructure	none	none	none
7	8/18/2018	Modem	Raven	06809	V4221-V	093644408
8	8/18/2018	Ozone	ThermoElectron Inc	000621	49i A1NAA	1009241798
9	8/18/2018	Ozone Standard	ThermoElectron Inc	000199	49i A3NAA	0607315737
10	8/18/2018	Sample Tower	Aluma Tower	666361	B	none
11	8/18/2018	Shelter Temperature	Campbell	none	107-L	none
12	8/18/2018	Siting Criteria	Siting Criteria	None	1	None
13	8/18/2018	Temperature	RM Young	06542	41342VC	14803
14	8/18/2018	Zero air pump	Werther International	06866	PC70/4	000815262

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2524	ARE128	Sandy Grenville	08/18/2018	DAS	Primary

Das Date: 8 /18/2018 **Audit Date** 8 /18/2018
Das Time: 10:09:34 **Audit Time** 10:09:34
Das Day: 230 **Audit Day** 230

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

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0001	V	V	0.0001
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4996	0.4996	V	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	0.9992	0.9991	V	V	-0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	42228	ARE128	Sandy Grenville	08/18/2018	Flow Rate	000462

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.05
3.85%	3.85%			**Cal Factor Full Scale**	1.02
				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	-0.07	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.02	l/m	l/m	
primary	test pt 1	1.550	1.560	1.49	0.000	1.50	l/m	l/m	-3.85%
primary	test pt 2	1.546	1.560	1.49	0.000	1.50	l/m	l/m	-3.85%
primary	test pt 3	1.542	1.560	1.49	0.000	1.50	l/m	l/m	-3.85%

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**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	290 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	1009241798	ARE128	Sandy Grenville	08/18/2018	Ozone	000621

Slope:	1.00136	**Slope:**	0.00000
Intercept	-0.47127	**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	1.00504	**Intercept**	0.32915
Cert Date	9/12/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.70	0.36	0.11	ppb		-0.25
primary	2	14.90	14.49	13.97	ppb		-0.52
primary	3	34.90	34.39	33.63	ppb	-2.23	
primary	4	67.90	67.23	67.03	ppb	-0.3	
primary	5	109.70	108.82	108.50	ppb	-0.29	

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.	95.8 kHz	pass
Cell A Noise	0.4 ppb	pass
Cell A Flow	0.76 lpm	pass
Cell A Pressure	707.2 mmHg	pass
Cell A Tmp.	36.9 C	pass
Cell B Freq.	78.0 kHz	pass
Cell B Noise	0.4 ppb	pass
Cell B Flow	0.74 lpm	pass
Cell B Pressure	707.9 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	14803	ARE128	Sandy Grenville	08/18/2018	Temperature	06542

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.36	0.62		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.46	0.37	0.000	0.4	C	0.06
primary	Temp Mid Range	24.91	24.62	0.000	24.2	C	-0.41
primary	Temp High Range	49.43	48.95	0.000	48.3	C	-0.62

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	ARE128	Sandy Grenville	08/18/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.34	0.36		

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.61	26.31	0.000	26.6	C	0.33
primary	Temp Mid Range	26.09	25.79	0.000	26.1	C	0.33
primary	Temp Mid Range	25.10	24.81	0.000	25.2	C	0.36

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ARE128	Technician	Sandy Grenville	Site Visit Date	08/18/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-7)	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 Data Form

F-02058-1500-S1-rev002

Site ID	ARE128	**Technician**	Sandy Grenville	**Site Visit Date**	08/18/2018

Site Sponsor (agency)	EPA	**USGS Map**	Arendtsville
Operating Group	PSU/private	**Map Scale**	
AQS #	42-001-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMROVE	**QAPP Latitude**	39.9231
Deposition Measurement	dry, wet, Hg, PM	**QAPP Longitude**	-77.3078
Land Use	agriculture	**QAPP Elevation Meters**	269
Terrain	complex - rolling	**QAPP Declination**	10.9
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(717) 677-9866	**Audit Latitude**	39.923241
Site Address 1	PSU Fruit Research Orchard	**Audit Longitude**	-77.307863
Site Address 2	Winding Road	**Audit Elevation**	266
County	Adams	**Audit Declination**	-11
City, State	Arendtsville, PA		
Zip Code	17307	**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 2116-7)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**					
Site OK	☑	**Notes**					

Driving Directions

From Gettysburg take route 34 north to Biglerville. At the intersection of 34 and 234 turn left (west) to Arendtsville. Continue into the town of Arendtsville. At the stop sign next to the gas station, turn left and immediately turn right, onto Chambersburg Street. Continue approximately 0.4 miles and turn right onto Winding Road. There is a sign for Boyer Nursery & Orchard. The site will be visible at the top of the hill in the orchard on the right.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ARE128 **Technician** Sandy Grenville **Site Visit Date** 08/18/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m	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 in an active orchard where spraying occurs. Fruit trees are rotated with corn and other crops.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID ARE128 **Technician** Sandy Grenville **Site Visit Date** 08/18/2018

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID ARE128 **Technician** Sandy Grenville **Site Visit Date** 08/18/2018

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	Temperature only
2	**Are all the meteorological sensors operational online, and reporting data?**	☑	Temperature only
3	**Are the shields for the temperature and RH sensors clean?**	☑	
4	**Are the aspirated motors working?**	☑	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 has been moved to a naturally aspirated shield on the sample tower. The temperature sensor was replaced the week before the audit and has not been calibrated onsite.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID ARE128 **Technician** Sandy Grenville **Site Visit Date** 08/18/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID ARE128 **Technician** Sandy Grenville **Site Visit Date** 08/18/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

The meteorological tower has been removed.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID ARE128 **Technician** Sandy Grenville **Site Visit Date** 08/18/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☐
SSRF	☑		☑
Site Ops Manual	☑	Oct 2010	☑
HASP	☑	Oct 2015	☑
Field Ops Manual	☑	Oct 2015	☑
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 ARE128 **Technician** Sandy Grenville **Site Visit Date** 08/18/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Refresher training by Lavery and Howell, July 2006
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Refresher training by Lavery and Howell, July 2006
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?	☑	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 ARE128 **Technician** Sandy Grenville **Site Visit Date** 08/18/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	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?	☐	Gloves not consistently 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 handles the filter caps with bare hands but handles the filter pack using the Ziploc filter bag.

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

Site ID ARE128 **Technician** Sandy Grenville **Site Visit Date** 08/18/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07045
DAS	Campbell	CR3000	2524	000400
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	000012187C	02661
Flow Rate	Apex	AXMC105LPMDPC	42228	000462
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	093644408	06809
Ozone	ThermoElectron Inc	49i A1NAA	1009241798	000621
Ozone Standard	ThermoElectron Inc	49i A3NAA	0607315737	000199
Sample Tower	Aluma Tower	B	none	666361
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VC	14803	06542
Zero air pump	Werther International	PC70/4	000815262	06866

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MKG113-Sandy Grenville-08/20/2018						
1	8/20/2018	Computer	Dell	07030	Inspiron 15	Unknown
2	8/20/2018	DAS	Campbell	000404	CR3000	2521
3	8/20/2018	Elevation	Elevation	None	1	None
4	8/20/2018	Filter pack flow pump	Thomas	03639	107CAB18	049400004427
5	8/20/2018	Flow Rate	Apex	000637	AXMC105LPMDPCV	illegible
6	8/20/2018	Infrastructure	Infrastructure	none	none	none
7	8/20/2018	Modem	Raven	06593	V4221-V	0844350394
8	8/20/2018	Ozone	ThermoElectron Inc	000703	49i A1NAA	1030244805
9	8/20/2018	Ozone Standard	ThermoElectron Inc	000374	49i A3NAA	0726124694
10	8/20/2018	Sample Tower	Aluma Tower	666362	B	AT-5107-E-4-11
11	8/20/2018	Shelter Temperature	Campbell	none	107-L	none
12	8/20/2018	Siting Criteria	Siting Criteria	None	1	None
13	8/20/2018	Temperature	RM Young	04312	41342	4009
14	8/20/2018	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	08/20/2018	DAS	Primary

Das Date: 8 /20/2018
Das Time: 16:39:50
Das Day: 232

Audit Date 8 /20/2018
Audit Time 16:39:50
Audit Day 232

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0001	V	V	0.0001
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4996	0.4995	V	V	-0.0001
7	0.7000	0.6995	0.6994	V	V	-0.0001
7	0.9000	0.8994	0.8992	V	V	-0.0002
7	1.0000	0.9993	0.9991	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	MKG113	Sandy Grenville	08/20/2018	Flow Rate	000637

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
0.88%	1.32%			**Cal Factor Full Scale**	1
				Rotometer Reading:	1.55

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	-0.01	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	1.497	1.510	1.50	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 2	1.499	1.510	1.50	0.000	1.50	l/m	l/m	-0.66%
primary	test pt 3	1.501	1.520	1.50	0.000	1.50	l/m	l/m	-1.32%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 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	1030244805	MKG113	Sandy Grenville	08/20/2018	Ozone	000703

Slope:	0.98818	**Slope:**	0.00000
Intercept	0.13975	**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	1.00504	**Intercept**	0.32915
Cert Date	9/12/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.00	-0.32	0.15	ppb		0.47
primary	2	15.00	14.59	14.47	ppb		-0.12
primary	3	34.90	34.39	33.86	ppb	-1.55	
primary	4	68.10	67.43	66.58	ppb	-1.27	
primary	5	108.90	108.02	107.10	ppb	-0.86	

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	1.015	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	98.5 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.55 lpm	pass
Cell A Pressure	692.4 mmHg	pass
Cell A Tmp.	37.4 C	pass
Cell B Freq.	88.7 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.62 lpm	pass
Cell B Pressure	693.0 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	4009	MKG113	Sandy Grenville	08/20/2018	Temperature	04312

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.14	0.22		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.36	0.27	0.000	0.2	C	-0.07
primary	Temp Mid Range	24.92	24.63	0.000	24.5	C	-0.13
primary	Temp High Range	49.00	48.52	0.000	48.3	C	-0.22

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	08/20/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.48	0.70		

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	28.97	28.65	0.000	28.2	C	-0.5
primary	Temp Mid Range	24.91	24.62	0.000	25.3	C	0.7
primary	Temp Mid Range	28.39	28.07	0.000	28.3	C	0.24

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	MKG113	Technician	Sandy Grenville	Site Visit Date	08/20/2018

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	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Poor	Status	Fail
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	MKG113	**Technician**	Sandy Grenville	**Site Visit Date**	08/20/2018

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 increasing 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** 08/20/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km	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	08/20/2018

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID MKG113 **Technician** Sandy Grenville **Site Visit Date** 08/20/2018

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	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** 08/20/2018

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

1	Do the sample inlets have at least a 270 degree arc of unrestricted airflow?	☑	
2	Are the sample inlets 3 - 15 meters above the ground?	☑	
3	Are the sample inlets > 1 meter from any major obstruction, and 20 meters from trees?	☐	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?	☑	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 MKG113 **Technician** Sandy Grenville **Site Visit Date** 08/20/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

The 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** 08/20/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Feb 2014	☐
HASP	☑	Feb 2014	☑
Field Ops Manual	☑	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** 08/20/2018

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	08/20/2018

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

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

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

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

Site ID MKG113 **Technician** Sandy Grenville **Site Visit Date** 08/20/2018

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	4009	04312
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*
KEF112-Sandy Grenville-08/21/2018						
1	8/21/2018	Computer	Dell	07054	Inspiron 15	Unknown
2	8/21/2018	DAS	Campbell	000414	CR3000	2537
3	8/21/2018	Elevation	Elevation	None	1	None
4	8/21/2018	Filter pack flow pump	Thomas	000965	107CA18	00000878
5	8/21/2018	Flow Rate	Apex	000671	AXMC105LPMDPCV	illegible
6	8/21/2018	Infrastructure	Infrastructure	none	none	none
7	8/21/2018	Modem	Raven	06455	V4221-V	0808337420
8	8/21/2018	Ozone	ThermoElectron Inc	000728	49i A1NAA	1105347306
9	8/21/2018	Ozone Standard	ThermoElectron Inc	000432	49i A3NAA	CM08200008
10	8/21/2018	Sample Tower	Aluma Tower	03443	A	none
11	8/21/2018	Shelter Temperature	Campbell	none	107-L	none
12	8/21/2018	Siting Criteria	Siting Criteria	None	1	None
13	8/21/2018	Temperature	RM Young	06388	41342	13992
14	8/21/2018	Zero air pump	Werther International	06932	C 70/4	000829174

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2537	KEF112	Sandy Grenville	08/21/2018	DAS	Primary

Das Date: 8 /21/2018 **Audit Date** 8 /21/2018
Das Time: 11:49:01 **Audit Time** 11:49:01
Das Day: 233 **Audit Day** 233

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		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6995	0.6996	V	V	0.0001
7	0.9000	0.8994	0.8994	V	V	0.0000
7	1.0000	0.9992	0.9993	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	KEF112	Sandy Grenville	08/21/2018	Flow Rate	000671

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
2.39%	2.61%			**Cal Factor Full Scale**	0.98
				Rotometer Reading:	1.6

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	0.01	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	1.518	1.530	1.53	0.000	1.49	l/m	l/m	-2.61%
primary	test pt 2	1.519	1.530	1.53	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.521	1.540	1.53	0.000	1.50	l/m	l/m	-2.60%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	300 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	08/21/2018	Ozone	000728

Slope:	0.98924	**Slope:**	0.00000
Intercept	-0.64896	**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	1.00504	**Intercept**	0.32915
Cert Date	9/12/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.90	0.56	0.20	ppb		-0.36
primary	2	15.00	14.59	13.75	ppb		-0.84
primary	3	35.00	34.49	33.30	ppb	-3.51	
primary	4	67.90	67.23	65.47	ppb	-2.65	
primary	5	109.50	108.62	107.10	ppb	-1.41	

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.	91.8 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	661.1 mmHg	pass
Cell A Tmp.	36.6 C	pass
Cell B Freq.	87.7 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	660.8 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	08/21/2018	Temperature	06388

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.08	0.17		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.21	0.12	0.000	0.1	C	0.02
primary	Temp Mid Range	25.66	25.37	0.000	25.3	C	-0.06
primary	Temp High Range	49.55	49.07	0.000	48.9	C	-0.17

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	08/21/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.32	0.54		

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	25.88	25.58	0.000	25.8	C	0.23
primary	Temp Mid Range	28.80	28.48	0.000	27.9	C	-0.54
primary	Temp Mid Range	23.78	23.50	0.000	23.7	C	0.2

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	KEF112	Technician	Sandy Grenville	Site Visit Date	08/21/2018

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	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	KEF112	**Technician**	Sandy Grenville	**Site Visit Date**	08/21/2018

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 has been replaced but the 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** 08/21/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m		☑
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m	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	08/21/2018

1	Are wind speed and direction sensors sited so as to avoid being influenced by obstructions?	☑	N/A
2	Are wind sensors mounted so as to minimize tower effects? (i.e. wind sensors should be mounted atop the tower or on a horizontally extended boom >2x the max diameter of the tower into the prevailing wind)	☑	N/A
3	Are the tower and sensors plumb?	☑	N/A
4	Are the temperature shields pointed north or positioned to avoid radiated heat sources such as buildings, walls, etc?	☑	
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☐	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 sample 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** 08/21/2018

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID KEF112 **Technician** Sandy Grenville **Site Visit Date** 08/21/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 15 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	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 10 meters of the ozone inlet and at the same height as the inlet.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID KEF112 **Technician** Sandy Grenville **Site Visit Date** 08/21/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☐
11	Tower comments?	Met Tower removed, 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** 08/21/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Feb 2014	☐
HASP	☑	Feb 2014	☑
Field Ops Manual	☑	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	08/21/2018

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 a zero/span/precision check is performed every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID KEF112 **Technician** Sandy Grenville **Site Visit Date** 08/21/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	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	☑	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** 08/21/2018

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
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	13992	06388
Zero air pump	Werther International	C 70/4	000829174	06932

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PSU106-Sandy Grenville-08/22/2018						
1	8/22/2018	Computer	Dell	07046	Inspiron 15	Unknown
2	8/22/2018	DAS	Campbell	000407	CR3000	2512
3	8/22/2018	Elevation	Elevation	None	1	None
4	8/22/2018	Filter pack flow pump	Thomas	06023	107CAB18	060400022676
5	8/22/2018	Flow Rate	Apex	000823	AXMC105LPMDPCV	50749
6	8/22/2018	Infrastructure	Infrastructure	none	none	none
7	8/22/2018	Modem	Raven	06483	V4221-V	0808310813
8	8/22/2018	Ozone	ThermoElectron Inc	000678	49i A1NAA	1030244791
9	8/22/2018	Ozone Standard	ThermoElectron Inc	000434	49i A3NAA	CM08200010
10	8/22/2018	Sample Tower	Aluma Tower	02747	A	none
11	8/22/2018	Shelter Temperature	Campbell	none	107-L	none
12	8/22/2018	Siting Criteria	Siting Criteria	None	1	None
13	8/22/2018	Temperature	RM Young	05046	41342VC	9642
14	8/22/2018	Zero air pump	Werther International	06921	C 70/4	000836216

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2512	PSU106	Sandy Grenville	08/22/2018	DAS	Primary

Das Date: 8 /20/2018
Das Time: 9:04:30
Das Day: 232

Audit Date 8 /20/2018
Audit Time 9:04:30
Audit Day 232

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		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4995	0.4996	V	V	0.0001
7	0.7000	0.6995	0.6994	V	V	-0.0001
7	0.9000	0.8993	0.8992	V	V	-0.0001
7	1.0000	0.9994	0.9992	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	50749	PSU106	Sandy Grenville	08/22/2018	Flow Rate	000823

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.02
				Cal Factor Full Scale	1
2.80%	3.85%			**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	-0.02	l/m	l/m	
primary	test pt 1	1.543	1.560	1.49	0.000	1.50	l/m	l/m	-3.85%
primary	test pt 2	1.520	1.530	1.49	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.527	1.540	1.49	0.000	1.50	l/m	l/m	-2.60%

Sensor Component	Leak Test	**Condition**	See comments	**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 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	1030244791	PSU106	Sandy Grenville	08/22/2018	Ozone	000678

Slope:	0.97946	**Slope:**	0.00000
Intercept	-1.22536	**Intercept**	0.00000
CorrCoff	0.99981	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	1.00	0.66	-0.09	ppb		-0.75
primary	2	15.00	14.59	13.46	ppb		-1.13
primary	3	35.00	34.49	32.01	ppb	-7.46	
primary	4	67.90	67.23	63.44	ppb	-5.8	
primary	5	110.00	109.12	106.50	ppb	-2.43	

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.	92.2 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	723.2 mmHg	pass
Cell A Tmp.	34.0 C	pass
Cell B Freq.	93.6 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	722.9 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	9642	PSU106	Sandy Grenville	08/22/2018	Temperature	05046

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.09	0.14		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.12	0.03	0.000	0.2	C	0.14
primary	Temp Mid Range	24.87	24.58	0.000	24.5	C	-0.05
primary	Temp High Range	48.59	48.11	0.000	48.0	C	-0.07

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	08/22/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.32	0.44		

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.91	23.63	0.000	24.1	C	0.44
primary	Temp Mid Range	23.65	23.37	0.000	23.7	C	0.37
primary	Temp Mid Range	24.42	24.14	0.000	24.3	C	0.16

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	PSU106	Technician	Sandy Grenville	Site Visit Date	08/22/2018

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	Fair	Status	pass

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PSU106	**Technician**	Sandy Grenville	**Site Visit Date**	08/22/2018

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** 08/22/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km	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	08/22/2018

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID PSU106 **Technician** Sandy Grenville **Site Visit Date** 08/22/2018

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	Temperature only
2	**Are all the meteorological sensors operational online, and reporting data?**	☑	Temperature only
3	**Are the shields for the temperature and RH sensors clean?**	☑	
4	**Are the aspirated motors working?**	☑	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** 08/22/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 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:

The zero air desiccant is saturated.

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID PSU106 **Technician** Sandy Grenville **Site Visit Date** 08/22/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

The meteorological tower has been removed.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID PSU106 **Technician** Sandy Grenville **Site Visit Date** 08/22/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID PSU106 **Technician** Sandy Grenville **Site Visit Date** 08/22/2018

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** 08/22/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, logbook, call-in
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☐	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** 08/22/2018

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	50749	000823
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	9642	05046
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*
ANA115-Sandy Grenville-09/10/2018						
1	9/10/2018	Computer	Dell	07017	Inspiron 15	9K2MC12
2	9/10/2018	DAS	Campbell	000339	CR3000	2118
3	9/10/2018	Elevation	Elevation	None	1	None
4	9/10/2018	Filter pack flow pump	Thomas	06025	107CAB18	060400022682
5	9/10/2018	Flow Rate	Apex	000809	AXMC105LPMDPCV	illegible
6	9/10/2018	Infrastructure	Infrastructure	none	none	none
7	9/10/2018	Modem	Raven	06588	V4221-V	0844352818
8	9/10/2018	Ozone	ThermoElectron Inc	000699	49i A1NAA	1030244804
9	9/10/2018	Ozone Standard	ThermoElectron Inc	000686	49i A3NAA	1030244818
10	9/10/2018	Sample Tower	Aluma Tower	000180	B	none
11	9/10/2018	Shelter Temperature	Campbell	none	107-L	none
12	9/10/2018	Siting Criteria	Siting Criteria	None	1	None
13	9/10/2018	Temperature	RM Young	06535	41342	14796
14	9/10/2018	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	2118	ANA115	Sandy Grenville	09/10/2018	DAS	Primary

Das Date: 9 /10/2018
Das Time: 13:11:30
Das Day: 253

Audit Date 9 /10/2018
Audit Time 13:11:30
Audit Day 253

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0005	0.0002	0.0005

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0001	V	V	0.0001
7	0.1000	0.0999	0.1000	V	V	0.0001
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4995	0.4997	V	V	0.0002
7	0.7000	0.6995	0.7000	V	V	0.0005
7	0.9000	0.8994	0.8995	V	V	0.0001
7	1.0000	0.9993	0.9995	V	V	0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	ANA115	Sandy Grenville	09/10/2018	Flow Rate	000809

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.01
1.53%	1.96%			**Cal Factor Full Scale**	1
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.00	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	1.512	1.530	1.50	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 2	1.508	1.520	1.50	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.510	1.520	1.50	0.000	1.50	l/m	l/m	-1.32%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	130 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	1030244804	ANA115	Sandy Grenville	09/10/2018	Ozone	000699

Slope:	1.01785	**Slope:**	0.00000
Intercept	0.03993	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.12	0.01	-0.08	ppb		-0.09
primary	2	15.26	15.10	15.46	ppb		0.36
primary	3	35.18	34.96	35.73	ppb	2.18	
primary	4	67.71	67.40	68.68	ppb	1.88	
primary	5	109.90	109.47	111.40	ppb	1.75	

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	1.043	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.7 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	697.8 mmHg	pass
Cell A Tmp.	32.7 C	pass
Cell B Freq.	87.1 kHz	pass
Cell B Noise	1.0 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	697.5 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	14796	ANA115	Sandy Grenville	09/10/2018	Temperature	06535

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.13	0.20		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.18	0.09	0.000	0.0	C	-0.07
primary	Temp Mid Range	25.08	24.79	0.000	24.7	C	-0.13
primary	Temp High Range	48.17	47.70	0.000	47.5	C	-0.2

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	Sandy Grenville	09/10/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.43	0.53		

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.98	21.71	0.000	22.1	C	0.36
primary	Temp Mid Range	24.35	24.07	0.000	23.5	C	-0.53
primary	Temp Mid Range	25.01	24.72	0.000	24.3	C	-0.4

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ANA115	Technician	Sandy Grenville	Site Visit Date	09/10/2018

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	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 Data Form

F-02058-1500-S1-rev002

Site ID	ANA115	**Technician**	Sandy Grenville	**Site Visit Date**	09/10/2018

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	**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 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** Sandy Grenville **Site Visit Date** 09/10/2018

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

Siting Distances OK ☑

Siting Criteria Comment

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	Sandy Grenville	Site Visit Date	09/10/2018

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	ANA115	Technician	Sandy Grenville	Site Visit Date	09/10/2018

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	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** Sandy Grenville **Site Visit Date** 09/10/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
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 ANA115 **Technician** Sandy Grenville **Site Visit Date** 09/10/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☐
11	Tower comments?	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** Sandy Grenville **Site Visit Date** 09/10/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☐		☐
HASP	☑	Oct 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	Sandy Grenville	Site Visit Date	09/10/2018

Site operation procedures

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

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	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?	☑	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 changed and a Z/S/P is performed every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID ANA115 **Technician** Sandy Grenville **Site Visit Date** 09/10/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed various times
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, 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** Sandy Grenville **Site Visit Date** 09/10/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	9K2MC12	07017
DAS	Campbell	CR3000	2118	000339
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	1030244804	000699
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244818	000686
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*
HOX148-Sandy Grenville-09/11/2018						
1	9/11/2018	Computer	Dell	07062	Inspiron 15	Unknown
2	9/11/2018	DAS	Campbell	000426	CR3000	2533
3	9/11/2018	Elevation	Elevation	None	1	None
4	9/11/2018	Filter pack flow pump	Thomas	06026	107CAB18	060400022659
5	9/11/2018	Flow Rate	Apex	000526	AXMC105LPMDPCV	48099
6	9/11/2018	Infrastructure	Infrastructure	none	none	none
7	9/11/2018	Modem	Raven	06480	H4222-C	0808311145
8	9/11/2018	Ozone	ThermoElectron Inc	000614	49i A1NAA	1009241794
9	9/11/2018	Ozone Standard	ThermoElectron Inc	000438	49i A3NAA	CM08200014
10	9/11/2018	Sample Tower	Aluma Tower	000131	B	none
11	9/11/2018	Shelter Temperature	Campbell	none	107-L	none
12	9/11/2018	Siting Criteria	Siting Criteria	None	1	None
13	9/11/2018	Temperature	RM Young	04357	41342	4187
14	9/11/2018	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	Sandy Grenville	09/11/2018	DAS	Primary

Das Date: 9 /13/2018 **Audit Date** 9 /13/2018
Das Time: 14:03:42 **Audit Time** 14:03:40
Das Day: 256 **Audit Day** 256

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		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/13/2012	**CorrCoff**	1.00000

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0001	V	V	0.0002
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4995	0.4996	V	V	0.0001
7	0.7000	0.6995	0.6996	V	V	0.0001
7	0.9000	0.8993	0.8994	V	V	0.0001
7	1.0000	0.9992	0.9993	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	48099	HOX148	Sandy Grenville	09/11/2018	Flow Rate	000526

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.01
2.27%	2.74%			**Cal Factor Full Scale**	0.98
				Rotometer Reading:	1.3

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.10	0.000	0.09	l/m	l/m	
primary	leak check	0.000	0.000	0.03	0.000	0.03	l/m	l/m	
primary	test pt 1	1.451	1.470	1.52	0.000	1.50	l/m	l/m	2.04%
primary	test pt 2	1.451	1.470	1.52	0.000	1.50	l/m	l/m	2.04%
primary	test pt 3	1.448	1.460	1.52	0.000	1.50	l/m	l/m	2.74%

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**	3.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	200 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241794	HOX148	Sandy Grenville	09/11/2018	Ozone	000614

Slope:	1.01978	**Slope:**	0.00000
Intercept	-0.80351	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.22	0.10	-0.24	ppb		-0.34
primary	2	15.56	15.40	14.76	ppb		-0.64
primary	3	34.72	34.51	34.10	ppb	-1.2	
primary	4	66.93	66.62	66.77	ppb	0.22	
primary	5	109.64	109.21	110.90	ppb	1.54	

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	1.049	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	100.5 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.70 lpm	pass
Cell A Pressure	706.1 mmHg	pass
Cell A Tmp.	32.2 C	pass
Cell B Freq.	96.2 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.69 lpm	pass
Cell B Pressure	706.7 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	4187	HOX148	Sandy Grenville	09/11/2018	Temperature	04357

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.09	0.12		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.20	0.11	0.000	0.1	C	-0.04
primary	Temp Mid Range	25.40	25.11	0.000	25.0	C	-0.1
primary	Temp High Range	49.70	49.22	0.000	49.1	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	HOX148	Sandy Grenville	09/11/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.46	0.58		

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	28.40	28.08	0.000	27.6	C	-0.47
primary	Temp Mid Range	25.24	24.95	0.000	24.6	C	-0.34
primary	Temp Mid Range	21.42	21.16	0.000	21.7	C	0.58

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	HOX148	Technician	Sandy Grenville	Site Visit Date	09/11/2018

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	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	Fair	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**	Sandy Grenville	**Site Visit Date**	09/11/2018

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 lower section of the shelter walls are beginning to rot and show mold.				
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** Sandy Grenville **Site Visit Date** 09/11/2018

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	Sandy Grenville	Site Visit Date	09/11/2018

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

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

Met tower removed and temperature installed in naturally aspirated shield on the west leg of the sample tower.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID HOX148 **Technician** Sandy Grenville **Site Visit Date** 09/11/2018

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

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

Upon arrival the temperature sensor was found outside of the shield and exposed to direct sunlight. It was secured following the audit. Temperature data should be considered suspect from the previous site visit until after the audit. The signal cables are showing signs of wear with the outer insulation missing in a few places.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	HOX148	Technician	Sandy Grenville	Site Visit Date	09/11/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 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** Sandy Grenville **Site Visit Date** 09/11/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID HOX148 **Technician** Sandy Grenville **Site Visit Date** 09/11/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	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** Sandy Grenville **Site Visit Date** 09/11/2018

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 inlet filter is replaced and a Z/S/P check is performed every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID HOX148 **Technician** Sandy Grenville **Site Visit Date** 09/11/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed mornings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	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** Sandy Grenville **Site Visit Date** 09/11/2018

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	060400022659	06026
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	4187	04357
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*
UVL124-Sandy Grenville-09/12/2018						
1	9/12/2018	Computer	Dell	07012	Inspiron 15	Unknown
2	9/12/2018	DAS	Campbell	000347	CR3000	2126
3	9/12/2018	Elevation	Elevation	None	1	None
4	9/12/2018	Filter pack flow pump	Thomas	02973	107CAB18	0493002467
5	9/12/2018	Flow Rate	Apex	000600	AXMC105LPMDPCV	illegible
6	9/12/2018	Infrastructure	Infrastructure	none	none	none
7	9/12/2018	Modem	Raven	06466	V4221-V	0808339409
8	9/12/2018	Ozone	ThermoElectron Inc	000680	49i A1NAA	1030244792
9	9/12/2018	Ozone Standard	ThermoElectron Inc	000362	49i A3NAA	0726124686
10	9/12/2018	Sample Tower	Aluma Tower	03557	A	none
11	9/12/2018	Shelter Temperature	Campbell	none	107-L	none
12	9/12/2018	Siting Criteria	Siting Criteria	None	1	None
13	9/12/2018	Temperature	RM Young	06504	41342	14624
14	9/12/2018	Zero air pump	Werther International	06936	C 70/4	000829169

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2126	UVL124	Sandy Grenville	09/12/2018	DAS	Primary

Das Date: 9 /12/2018
Das Time: 11:08:09
Das Day: 255

Audit Date 9 /12/2018
Audit Time 11:08:09
Audit Day 225

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

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

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

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2997	0.2997	V	V	0.0000
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	0.8994	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	UVL124	Sandy Grenville	09/12/2018	Flow Rate	000600

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

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.02
25.74%	26.11%			**Cal Factor Full Scale**	0.99
				Rotometer Reading:	2

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	-0.03	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	2.013	2.030	1.51	0.000	1.50	l/m	l/m	-26.11%
primary	test pt 2	2.000	2.010	1.51	0.000	1.50	l/m	l/m	-25.37%
primary	test pt 3	2.009	2.020	1.50	0.000	1.50	l/m	l/m	-25.74%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	10 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	1030244792	UVL124	Sandy Grenville	09/12/2018	Ozone	000680

Slope:	0.98778	**Slope:**	0.00000
Intercept	-0.12076	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.10	0.00	0.21	ppb		0.21
primary	2	15.18	15.02	14.57	ppb		-0.45
primary	3	34.61	34.40	33.67	ppb	-2.14	
primary	4	67.38	67.07	65.94	ppb	-1.7	
primary	5	111.12	110.68	109.40	ppb	-1.16	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.20	pass
Span	1.009	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	100.5 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	724.5 mmHg	pass
Cell A Tmp.	Not tested	pass
Cell B Freq.	94.5 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.65 lpm	pass
Cell B Pressure	725.0 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	Sandy Grenville	09/12/2018	Temperature	06504

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

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.04	0.10		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.19	0.10	0.000	0.1	C	-0.02
primary	Temp Mid Range	25.23	24.94	0.000	24.8	C	-0.1
primary	Temp High Range	48.64	48.16	0.000	48.2	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	UVL124	Sandy Grenville	09/12/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.22	0.42		

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.60	24.31	0.000	24.7	C	0.42
primary	Temp Mid Range	23.54	23.26	0.000	23.4	C	0.16
primary	Temp Mid Range	26.76	26.46	0.000	26.4	C	-0.08

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
UVL124	Sandy Grenville	09/12/2018

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	Good	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	Good	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

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	UVL124	**Technician**	Sandy Grenville	**Site Visit Date**	09/12/2018

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** Sandy Grenville **Site Visit Date** 09/12/2018

Potential Interferent	Minimum Distance From Measurement Apparatus	Distance	Pass = Checked
Large Point Source of SO2 or NOx	20 to 40 km		☑
Major industrial complex	10 to 20 km		☑
City > 50,000 population	40 km		☑
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m	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	Sandy Grenville	Site Visit Date	09/12/2018

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID UVL124 **Technician** Sandy Grenville **Site Visit Date** 09/12/2018

1	**Do all the meterological sensors appear to be intact, in good condition, and well maintained?**	☑	Temperature only
2	**Are all the meteorological sensors operational online, and reporting data?**	☑	Temperature only
3	**Are the shields for the temperature and RH sensors clean?**	☑	
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:

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	Sandy Grenville	Site Visit Date	09/12/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 12 meters
4	Describe dry dep sample tube.		3/8 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	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** Sandy Grenville **Site Visit Date** 09/12/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☐	☐
10	Is the sample tower stable and grounded?	☑	☐
11	Tower comments?	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	Sandy Grenville	Site Visit Date	09/12/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2014	☑
HASP	☑	Oct 2014	☑
Field Ops Manual	☐		☐
Calibration Reports	☑	4/3/2018	☑
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.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	UVL124	Technician	Sandy Grenville	Site Visit Date	09/12/2018

Site operation procedures

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

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

QC Check Performed		Frequency	Compliant
Multipoint Calibrations	☑	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?	☑	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** Sandy Grenville **Site Visit Date** 09/12/2018

Site operation procedures

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

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

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

The SSRF indicates that the ozone inlet filter is changed weekly rather than every two weeks as is performed.

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

Site ID UVL124 **Technician** Sandy Grenville **Site Visit Date** 09/12/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07012
DAS	Campbell	CR3000	2126	000347
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	1030244792	000680
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*
CTH110-Eric Hebert-09/25/2018						
1	9/25/2018	Computer	Dell	07044	Inspiron 15	Unknown
2	9/25/2018	DAS	Campbell	000415	CR3000	2510
3	9/25/2018	Elevation	Elevation	None	1	None
4	9/25/2018	Filter pack flow pump	Thomas	02664	107CA18	1092135217
5	9/25/2018	Flow Rate	Apex	000557	AXMC105LPMDPCV	unknown
6	9/25/2018	Infrastructure	Infrastructure	none	none	none
7	9/25/2018	Modem	Raven	06599	V4221-V	0844349892
8	9/25/2018	Ozone	ThermoElectron Inc	000735	49i A1NAA	1105347308
9	9/25/2018	Ozone Standard	ThermoElectron Inc	000447	49i A3NAA	CM08200023
10	9/25/2018	Sample Tower	Aluma Tower	666363	B	AT-5107-E-4-10
11	9/25/2018	Shelter Temperature	Campbell	none	107-L	none
12	9/25/2018	Shield (10 meter)	RM Young	none	unknown	none
13	9/25/2018	Siting Criteria	Siting Criteria	None	1	None
14	9/25/2018	Temperature	RM Young	06301	41342	12540
15	9/25/2018	Zero air pump	Werther International	06864	PC70/4	000815261

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2510	CTH110	Eric Hebert	09/25/2018	DAS	Primary

Das Date: 9 /26/2018
Das Time: 14:46:00
Das Day: 269

Audit Date 9 /26/2018
Audit Time 14:46:00
Audit Day 269

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0002

Mfg	Datel	**Parameter**	DAS
Serial Number	4000392	**Tfer Desc.**	Source generator (D
Tfer ID	01321		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/24/2018	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.1000	V	V	0.0001
7	0.3000	0.3000	0.2999	V	V	-0.0001
7	0.5000	0.5000	0.4999	V	V	-0.0001
7	0.7000	0.7000	0.6998	V	V	-0.0002
7	0.9000	0.9000	0.8998	V	V	-0.0002
7	1.0000	1.0000	0.9998	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	unknown	CTH110	Eric Hebert	09/25/2018	Flow Rate	000557

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
2.17%	2.60%			**Cal Factor Full Scale**	0.9
				Rotometer Reading:	1.55

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.02	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.05	0.000	0.04	l/m	l/m	
primary	test pt 1	1.538	1.530	1.66	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 2	1.538	1.530	1.66	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.541	1.540	1.66	0.000	1.50	l/m	l/m	-2.60%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	5.5 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	1105347308	CTH110	Eric Hebert	09/25/2018	Ozone	000735

Slope:	0.97547	**Slope:**	0.00000
Intercept	0.59409	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.10	0.02	0.21	ppb		0.19
primary	2	13.18	13.06	13.47	ppb		0.41
primary	3	34.52	34.33	34.59	ppb	0.75	
primary	4	70.74	70.44	69.12	ppb	-1.89	
primary	5	112.55	112.11	109.90	ppb	-1.99	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	Not tested	pass
Span	Not tested	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	101.7 kHz	pass
Cell A Noise	1.8 ppb	pass
Cell A Flow	0.58 lpm	pass
Cell A Pressure	688.4 mmHg	pass
Cell A Tmp.	29.0 C	pass
Cell B Freq.	102.2 kHz	pass
Cell B Noise	1.7 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	689.0 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	12540	CTH110	Eric Hebert	09/25/2018	Temperature	06301

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00757	**Intercept**	-0.09210
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.08	0.13		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.04	0.05	0.000	0.1	C	0.08
primary	Temp Mid Range	21.71	21.64	0.000	21.7	C	0.02
primary	Temp High Range	49.75	49.47	0.000	49.3	C	-0.13

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	CTH110	Eric Hebert	09/25/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.13	1.42		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00757	Intercept	-0.09210
Cert Date	2/13/2018	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	23.86	23.77	0.000	24.8	C	1.05
primary	Temp Mid Range	23.30	23.22	0.000	24.6	C	1.42
primary	Temp Mid Range	23.61	23.52	0.000	24.5	C	0.93

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	CTH110	Technician	Eric Hebert	Site Visit Date	09/25/2018

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-6)	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	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Fair	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	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 Data Form

F-02058-1500-S1-rev002

Site ID	CTH110	**Technician**	Eric Hebert	**Site Visit Date**	09/25/2018

Site Sponsor (agency)	EPA	**USGS Map**	Mecklenburg
Operating Group	IES	**Map Scale**	
AQS #	36-109-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, ammonia	**QAPP Latitude**	42.4010
Deposition Measurement	dry, wet	**QAPP Longitude**	-76.6535
Land Use	woodland - mixed	**QAPP Elevation Meters**	515
Terrain	rolling	**QAPP Declination**	12.3
Conforms to MLM	No	**QAPP Declination Date**	12/28/2004
Site Telephone	(607) 564-7622	**Audit Latitude**	42.400875
Site Address 1	CR 136 (Connecticut Hill Road)	**Audit Longitude**	-76.653516
Site Address 2		**Audit Elevation**	511
County	Tompkins	**Audit Declination**	-12.0
City, State	Newfield, NY		
Zip Code	14867	**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 (s/n 2116-6) **Shelter Size** 640 cuft

Shelter Clean ☐ **Notes** The condition of the shelter walls are beginning to deteriorate.

Site OK ☑ **Notes**

Driving Directions From Ithaca take route 13 south to hwy 327. Bear right onto hwy 327 and go past both the lower and upper entrances for Robert Treman St Park. Turn left at the second left past the upper entrance to the park onto Trumbell Corners Road. Continue on Trumbell Corners Rd for approximately one mile to the stop sign. Turn right at the stop onto Connecticut Hill Road and continue for approximately 1/4 mile where it veers to the right. The site is up the hill on the left just after the turn in the road.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CTH110 **Technician** Eric Hebert **Site Visit Date** 09/25/2018

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

Siting Distances OK ☑

Siting Criteria Comment

There is a point source north of Ithaca within 40 km of the site. The tree line is less than 50 m from the site. The siting is acceptable even with the noted exceptions. Trees and overgrowth have recently been removed from the site which has improved siting criteria.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	CTH110	Technician	Eric Hebert	Site Visit Date	09/25/2018

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

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

The temperature sensor is mounted on the east leg of the sample tower.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	CTH110	Technician	Eric Hebert	Site Visit Date	09/25/2018

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	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 CTH110 **Technician** Eric Hebert **Site Visit Date** 09/25/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CTH110 **Technician** Eric Hebert **Site Visit Date** 09/25/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

The meteorological tower has been removed and the temperature sensor has been moved to the east leg of the sample tower at 10 meters above the ground. The shield has been changed from aspirated to naturally aspirated.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID CTH110 **Technician** Eric Hebert **Site Visit Date** 09/25/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Oct 2015	☑
Field Ops Manual	☑	Oct 2015	☑
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID CTH110 **Technician** Eric Hebert **Site Visit Date** 09/25/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained at ESE in 1987
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 inlet filter is replaced and a Z/S/P is performed every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID CTH110 **Technician** Eric Hebert **Site Visit Date** 09/25/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
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 CTH110 **Technician** Eric Hebert **Site Visit Date** 09/25/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07044
DAS	Campbell	CR3000	2510	000415
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	1092135217	02664
Flow Rate	Apex	AXMC105LPMDPC	unknown	000557
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V4221-V	0844349892	06599
Ozone	ThermoElectron Inc	49i A1NAA	1105347308	000735
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200023	000447
Sample Tower	Aluma Tower	B	AT-5107-E-4-10	666363
Shelter Temperature	Campbell	107-L	none	none
Shield (10 meter)	RM Young	unknown	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	12540	06301
Zero air pump	Werther International	PC70/4	000815261	06864

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
HWF187-Eric Hebert-09/30/2018						
1	9/30/2018	Computer	Dell	07034	Inspiron 15	Unknown
2	9/30/2018	DAS	Campbell	000356	CR3000	2134
3	9/30/2018	Elevation	Elevation	None	1	None
4	9/30/2018	Filter pack flow pump	Thomas	02358	illegible	illegible
5	9/30/2018	Flow Rate	Apex	000592	AXMC105LPMDPCV	illegible
6	9/30/2018	Infrastructure	Infrastructure	none	none	none
7	9/30/2018	Modem	Raven	06807	H4223-C	0934393748
8	9/30/2018	Ozone	ThermoElectron Inc	000700	49i A1NAA	1030244793
9	9/30/2018	Ozone Standard	ThermoElectron Inc	000445	49i A3NAA	CM08200021
10	9/30/2018	Sample Tower	Aluma Tower	illegible	B	AT-5107-E-4-12
11	9/30/2018	Shelter Temperature	Campbell	none	107-L	unknown
12	9/30/2018	Siting Criteria	Siting Criteria	None	1	None
13	9/30/2018	Temperature	RM Young	06503	41342	14623
14	9/30/2018	Zero air pump	Werther International	06931	C 70/4	000836212
15	9/30/2018	Zero air pump	Teledyne	000772	701H	608

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2134	HWF187	Eric Hebert	09/30/2018	DAS	Primary

Das Date: 10/1 /2018
Das Time: 8:00:00
Das Day: 274

Audit Date 10/1 /2018
Audit Time 8:00:15
Audit Day 274

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		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/24/2018	**CorrCoff**	1.00000

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	HWF187	Eric Hebert	09/30/2018	Flow Rate	000592

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00178	**Intercept**	0.00161
Cert Date	7/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
3.23%	3.23%			**Cal Factor Full Scale**	0.96
				Rotometer Reading:	1.6

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	0.00	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	1.557	1.550	1.56	0.000	1.50	l/m	l/m	-3.23%
primary	test pt 2	1.559	1.550	1.55	0.000	1.50	l/m	l/m	-3.23%
primary	test pt 3	1.558	1.550	1.56	0.000	1.50	l/m	l/m	-3.23%

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**	6.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	3.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244793	HWF187	Eric Hebert	09/30/2018	Ozone	000700

Slope:	0.96137	**Slope:**	0.00000
Intercept	0.40858	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180930075	**Tfer Desc.**	Ozone primary stan
Tfer ID	01115		
Slope	1.00320	**Intercept**	0.07166
Cert Date	9/14/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	-0.45	-0.51	-0.13	ppb		0.38
primary	2	13.10	12.98	12.88	ppb		-0.1
primary	3	34.61	34.42	33.53	ppb	-2.62	
primary	4	67.21	66.92	64.83	ppb	-3.17	
primary	5	110.12	109.69	105.80	ppb	-3.61	

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	0.983	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	94.3 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.62 lpm	pass
Cell A Pressure	710.0 mmHg	pass
Cell A Tmp.	38.7 C	pass
Cell B Freq.	93.1 kHz	pass
Cell B Noise	Not tested	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	711.0 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	HWF187	Eric Hebert	09/30/2018	Temperature	06503

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232679	**Tfer Desc.**	RTD
Tfer ID	01228		
Slope	1.00757	**Intercept**	-0.09210
Cert Date	2/13/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.09	0.18		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	-0.08	0.01	0.000	0.1	C	0.06
primary	Temp Mid Range	23.56	23.47	0.000	23.5	C	0.04
primary	Temp High Range	45.84	45.59	0.000	45.8	C	0.18

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	unknown	HWF187	Eric Hebert	09/30/2018	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.32	0.42		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232679	Tfer Desc.	RTD
Tfer ID	01228		
Slope	1.00757	Intercept	-0.09210
Cert Date	2/13/2018	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	28.17	28.05	0.000	27.8	C	-0.24
primary	Temp Mid Range	28.44	28.32	0.000	28.0	C	-0.3
primary	Temp Mid Range	28.71	28.59	0.000	28.2	C	-0.42

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	HWF187	Technician	Eric Hebert	Site Visit Date	09/30/2018

Shelter Make	Shelter Model	Shelter Size
ESF	none	1630 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	Poor	Status	Fail
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 Data Form

F-02058-1500-S1-rev002

Site ID	HWF187	**Technician**	Eric Hebert	**Site Visit Date**	09/30/2018

Site Sponsor (agency)	EPA	**USGS Map**	Newcomb
Operating Group	SUNY/ESF	**Map Scale**	
AQS #	36-031-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, Hg	**QAPP Latitude**	43.9732
Deposition Measurement	dry, wet, Hg	**QAPP Longitude**	-74.2232
Land Use	woodland - mixed	**QAPP Elevation Meters**	502
Terrain	complex	**QAPP Declination**	14.5
Conforms to MLM	No	**QAPP Declination Date**	6/17/2004
Site Telephone	(518) 582-4800	**Audit Latitude**	43.973044
Site Address 1	Adirondack Ecological Center	**Audit Longitude**	-74.223317
Site Address 2		**Audit Elevation**	497
County	Essex	**Audit Declination**	-14
City, State	Newcomb, NY		
Zip Code	12852	**Fire Extinguisher** ☑ Present	Inspected in Oct 2018
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** ESF **Model** none **Shelter Size** 1630 cuft

Shelter Clean ☑ **Notes** The shelter is in fair condition.

Site OK ☑ **Notes**

Driving Directions From I-87 take exit 29 west to Newcomb. Continue through Newcomb (about 6 miles). Just west of town, turn right (north) at the Adirondack Ecological Center. Continue past the building on the dirt road to the site.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID HWF187 **Technician** Eric Hebert **Site Visit Date** 09/30/2018

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

Siting Distances OK ☑

Siting Criteria Comment

Trees are beginning to approach the limit for ozone inlet criteria. The conditions were discussed with the site operator.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	HWF187	Technician	Eric Hebert	Site Visit Date	09/30/2018

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

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	HWF187	Technician	Eric Hebert	Site Visit Date	09/30/2018

1	Do all the meterological sensors appear to be intact, in good condition, and well maintained?	☑	Temperature only
2	Are all the meteorological sensors operational online, and reporting data?	☑	Temperature only
3	Are the shields for the temperature and RH sensors clean?	☑	
4	Are the aspirated motors working?	☑	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	HWF187	Technician	Eric Hebert	Site Visit Date	09/30/2018

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID HWF187 **Technician** Eric Hebert **Site Visit Date** 09/30/2018

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID HWF187 **Technician** Eric Hebert **Site Visit Date** 09/30/2018

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Nov 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:

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID	HWF187	Technician	Eric Hebert	Site Visit Date	09/30/2018

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained during site installation by ESE 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	☑	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 inlet filter is replaced and the sample train is leak tested every other week.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID HWF187 **Technician** Eric Hebert **Site Visit Date** 09/30/2018

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF, 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 HWF187 **Technician** Eric Hebert **Site Visit Date** 09/30/2018

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07034
DAS	Campbell	CR3000	2134	000356
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	illegible	illegible	02358
Flow Rate	Apex	AXMC105LPMDPC	illegible	000592
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4223-C	0934393748	06807
Ozone	ThermoElectron Inc	49i A1NAA	1030244793	000700
Ozone Standard	ThermoElectron Inc	49i A3NAA	CM08200021	000445
Sample Tower	Aluma Tower	B	AT-5107-E-4-12	illegible
Shelter Temperature	Campbell	107-L	unknown	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	14623	06503
Zero air pump	Teledyne	701H	608	000772
Zero air pump	Werther International	C 70/4	000836212	06931

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 12/4/2018 8:41:55 PM

SiteVisitDate	Site	Technician
09/10/2018	ANA115	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	0.13	c	**P**
2	Temperature max error	P	4	0.5	9	0.20	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01785	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.03993	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.1	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.09	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.36	ppb	**P**
9	Ozone % difference max	P	7	10	4	2.4	%	**P**
10	Flow Rate average % difference	P	10	5	4	1.53	%	**P**
11	Flow Rate max % difference	P	10	5	4	1.96	%	**P**
12	DAS Voltage average error	P	7	0.003	49	0.0002	V	**P**
13	Shelter Temperature average error	P	5	2	15	0.43	c	**P**
14	Shelter Temperature max error	P	5	2	15	0.53	c	**P**

SiteVisitDate	Site	Technician
09/10/2018	ANA115	Sandy Grenville

Field Systems Comments

1 **Parameter:** DasComments

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

2 **Parameter:** SiteOpsProcedures

The ozone inlet filter is changed and a Z/S/P is performed every two weeks.

3 **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.

4 **Parameter:** ShelterCleanNotes

The shelter is in fair condition, however somewhat cluttered.

EEMS Spot Report

Data Compiled: 12/3/2018 4:59:29 PM

SiteVisitDate	Site	Technician
08/18/2018	ARE128	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	15	0.36	c	**P**
2	Temperature max error	P	4	0.5	15	0.62	c	**Fail**
3	Ozone Slope	P	0	1.1	4	1.00136	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.47127	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.6	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.25	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.52	ppb	**P**
9	Ozone % difference max	P	7	10	4	3.6	%	**P**
10	Flow Rate average % difference	P	10	5	8	3.85	%	**P**
11	Flow Rate max % difference	P	10	5	8	3.85	%	**P**
12	DAS Voltage average error	P	7	0.003	70	0.0001	V	**P**
13	Shelter Temperature average error	P	5	2	15	0.34	c	**P**
14	Shelter Temperature max error	P	5	2	15	0.36	c	**P**

SiteVisitDate	Site	Technician
08/18/2018	ARE128	Sandy Grenville

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operator handles the filter caps with bare hands but handles the filter pack using the Ziploc filter bag.

2 **Parameter:** DasComments

The meteorological tower has been removed.

3 **Parameter:** SitingCriteriaCom

The site is located in an active orchard where spraying occurs. Fruit trees are rotated with corn and other crops.

4 **Parameter:** MetOpMaintCom

The 10-meter temperature sensor has been moved to a naturally aspirated shield on the sample tower. The temperature sensor was replaced the week before the audit and has not been calibrated onsite.

EEMS Spot Report

Data Compiled: 12/3/2018 9:02:58 AM

SiteVisitDate	Site	Technician
08/01/2018	CDR119	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	0.98984	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.45756	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.6	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.29	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.69	ppb	**P**
7	Ozone % difference max	P	7	10	4	4.6	%	**P**

EEMS Spot Report

Data Compiled: 12/3/2018 1:55:49 PM

SiteVisitDate	Site	Technician
08/06/2018	CHC432	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	3.86	c	**Fail**
2	Temperature2meter max error	P	5	0.5	3	5.73	c	**Fail**
3	Wind Speed average error below 5m/s in m/s	P	3	0.5	4	0.05	m/s	**P**
4	Wind Speed max error below 5m/s in m/s	P	3	0.5	4	0.20	m/s	**P**
5	Wind Speed average % difference above 5 m/s	P	3	5	4	0.1	%	**P**
6	Wind Speed max % difference above 5 m/s	P	3	5	4	0.2	%	**P**
7	Wind Speed Torque average error	P	3	0.5	1	0.30	g-cm	**P**
8	Wind Speed Torque max error	P	3	0.5	1	0.3	g-cm	**P**
9	Wind Direction Input Deg True average error (de	P	2	5	4	2.0	degrees	**P**
10	Wind Direction Input Deg True max error (deg)	P	2	5	4	4	degrees	**P**
11	Wind Direction Linearity average error (deg)	P	2	5	8	1.0	degrees	**P**
12	Wind Direction Linearity max error (deg)	P	2	5	8	3	degrees	**P**
13	Wind Direction Torque average error	P	2	30	1	5	g-cm	**P**
14	Wind Direction Torque max error	P	2	30	1	5	g-cm	**P**
15	Relative Humidity average below 85%	P	6	10	2	3.1	%	**P**
16	Relative Humidity max below 85%	P	6	10	2	4.5	%	**P**
17	Solar Radiation % diff of avg	P	9	10	5	0.91	%	**P**
18	Solar Radiation % diff of max STD value	P	9	10	5	1.5	%	**P**
19	Precipitation average % difference	P	1	10	2	5.5	%	**P**
20	Precipitation max % difference	P	1	10	2	7.3	%	**P**
21	Ozone Slope	P	0	1.1	4	1.00902	unitless	**P**
22	Ozone Intercept	P	0	5	4	-0.06102	ppb	**P**
23	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
24	Ozone % difference avg	P	7	10	4	0.7	%	**P**
25	Ozone Absolute Difference g1	P	7	3	1	0.05	ppb	**P**
26	Ozone Absolute Difference g2	P	7	1.5	1	-0.03	ppb	**P**
27	Ozone % difference max	P	7	10	4	0.9	%	**P**
28	DAS Voltage average error	P	9	0.003	14	0.0004	V	**P**
29	Shelter Temperature average error	P	5	2	6	3.34	c	**Fail**
30	Shelter Temperature max error	P	5	2	6	3.51	c	**Fail**

SiteVisitDate	Site	Technician
08/06/2018	CHC432	Martin Valvur

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Dry deposition samples are not collected at this CASTNET site.

EEMS Spot Report

Data Compiled: 12/3/2018 9:18:37 AM

SiteVisitDate	Site	Technician
08/02/2018	CKT136	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	0.98748	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.32891	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.3	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.28	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.49	ppb	**P**
7	Ozone % difference max	P	7	10	4	3.3	%	**P**

EEMS Spot Report

Data Compiled: 12/4/2018 8:17:50 PM

SiteVisitDate	Site	Technician
08/30/2018	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	1.03442	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.47485	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.08	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.08	ppb	**P**
7	Ozone % difference max	P	7	10	4	3.1	%	**P**

EEMS Spot Report

Data Compiled: 12/4/2018 10:16:25 PM

SiteVisitDate	Site	Technician
09/25/2018	CTH110	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	0.13	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97547	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.59409	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.9	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.19	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	0.41	ppb	**P**
9	Ozone % difference max	P	7	10	4	3.1	%	**P**
10	Flow Rate average % difference	P	10	5	4	2.17	%	**P**
11	Flow Rate max % difference	P	10	5	4	2.6	%	**P**
12	DAS Voltage average error	P	7	0.003	56	0.0001	V	**P**
13	Shelter Temperature average error	P	5	2	15	1.13	c	**P**
14	Shelter Temperature max error	P	5	2	15	1.42	c	**P**

SiteVisitDate	Site	Technician
09/25/2018	CTH110	Eric Hebert

Field Systems Comments

1 **Parameter:** DasComments

The meteorological tower has been removed and the temperature sensor has been moved to the east leg of the sample tower at 10 meters above the ground. The shield has been changed from aspirated to naturally aspirated.

2 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and a Z/S/P is performed every two weeks.

3 **Parameter:** SitingCriteriaCom

There is a point source north of Ithaca within 40 km of the site. The tree line is less than 50 m from the site. The siting is acceptable even with the noted exceptions. Trees and overgrowth have recently been removed from the site which has improved siting criteria.

4 **Parameter:** ShelterCleanNotes

The condition of the shelter walls are beginning to deteriorate.

5 **Parameter:** MetSensorComme

The temperature sensor is mounted on the east leg of the sample tower.

EEMS Spot Report

Data Compiled: 12/3/2018 8:31:29 AM

SiteVisitDate	Site	Technician
07/06/2018	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	1.01182	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.37141	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.64	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.18	ppb	**P**
7	Ozone % difference max	P	7	10	4	3.0	%	**P**

EEMS Spot Report

Data Compiled: 12/4/2018 9:38:31 PM

SiteVisitDate	Site	Technician
09/11/2018	HOX148	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	0.09	c	**P**
2	Temperature max error	P	4	0.5	6	0.12	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01978	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.80351	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.8	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.34	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.64	ppb	**P**
9	Ozone % difference max	P	7	10	4	4.2	%	**P**
10	Flow Rate average % difference	P	10	5	8	2.27	%	**P**
11	Flow Rate max % difference	P	10	5	8	2.74	%	**P**
12	DAS Voltage average error	P	7	0.003	63	0.0001	V	**P**
13	Shelter Temperature average error	P	5	2	15	0.46	c	**P**
14	Shelter Temperature max error	P	5	2	15	0.58	c	**P**

SiteVisitDate	Site	Technician
09/11/2018	HOX148	Sandy Grenville

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone analyzer sample inlet filter is replaced and a Z/S/P check is performed every two weeks.

2 **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.

3 **Parameter:** ShelterCleanNotes

The lower section of the shelter walls are beginning to rot and show mold.

4 **Parameter:** MetSensorComme

Met tower removed and temperature installed in naturally aspirated shield on the west leg of the sample tower.

5 **Parameter:** MetOpMaintCom

Upon arrival the temperature sensor was found outside of the shield and exposed to direct sunlight. It was secured following the audit. Temperature data should be considered suspect from the previous site visit until after the audit. The signal cables are showing signs of wear with the outer insulation missing in a few places.

EEMS Spot Report

Data Compiled: 12/4/2018 10:43:39 PM

SiteVisitDate	Site	Technician
09/30/2018	HWF187	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	15	0.09	c	**P**
2	Temperature max error	P	4	0.5	15	0.18	c	**P**
3	Ozone Slope	P	0	1.1	4	0.96137	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.40858	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.5	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.38	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.1	ppb	**P**
9	Ozone % difference max	P	7	10	4	3.5	%	**P**
10	Flow Rate average % difference	P	10	5	4	3.23	%	**P**
11	Flow Rate max % difference	P	10	5	4	3.23	%	**P**
12	Shelter Temperature average error	P	5	2	18	0.32	c	**P**
13	Shelter Temperature max error	P	5	2	18	0.42	c	**P**

SiteVisitDate	Site	Technician
09/30/2018	HWF187	Eric Hebert

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone inlet filter is replaced and the sample train is leak tested every other week.

2 **Parameter:** SitingCriteriaCom

Trees are beginning to approach the limit for ozone inlet criteria. The conditions were discussed with the site operator.

3 **Parameter:** ShelterCleanNotes

The shelter is in fair condition.

EEMS Spot Report

Data Compiled: 12/3/2018 6:03:45 PM

SiteVisitDate	Site	Technician
08/21/2018	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	15	0.08	c	**P**
2	Temperature max error	P	4	0.5	15	0.17	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98924	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.64896	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.3	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.36	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.84	ppb	**P**
9	Ozone % difference max	P	7	10	4	5.8	%	**P**
10	Flow Rate average % difference	P	10	5	6	2.39	%	**P**
11	Flow Rate max % difference	P	10	5	6	2.61	%	**P**
12	DAS Voltage average error	P	7	0.003	63	0.0000	V	**P**
13	Shelter Temperature average error	P	5	2	15	0.32	c	**P**
14	Shelter Temperature max error	P	5	2	15	0.54	c	**P**

SiteVisitDate	Site	Technician
08/21/2018	KEF112	Sandy Grenville

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The inlet filter is replaced and a zero/span/precision check is performed 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 has been replaced but the bottom of walls are beginning to deteriorate.

4 **Parameter:** PollAnalyzerCom

Trees to the east are within 10 meters of the ozone inlet and at the same height as the inlet.

5 **Parameter:** MetSensorComme

The sample 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: 12/3/2018 12:46:01 PM

SiteVisitDate	Site	Technician
08/03/2018	MCK131	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	0.99623	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.77359	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.79	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.94	ppb	**P**
7	Ozone % difference max	P	7	10	4	6.3	%	**P**

EEMS Spot Report

Data Compiled: 12/3/2018 12:41:03 PM

SiteVisitDate	Site	Technician
08/03/2018	MCK231	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	0.98809	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.56309	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.6	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.63	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.53	ppb	**P**
7	Ozone % difference max	P	7	10	4	3.6	%	**P**

EEMS Spot Report

Data Compiled: 12/3/2018 3:02:00 PM

SiteVisitDate	Site	Technician
08/07/2018	MEV405	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	0.28	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.38	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98879	unitless	**P**
4	Ozone Intercept	P	0	5	4	-2.76421	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99885	unitless	**P**
6	Ozone % difference avg	P	7	10	4	14.6	%	**Fail**
7	Ozone Absolute Difference g1	P	7	3	1	0.26	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-5.76	ppb	**Fail**
9	Ozone % difference max	P	7	10	4	39.5	%	**Fail**
10	Flow Rate average % difference	P	10	5	10	3.74	%	**P**
11	Flow Rate max % difference	P	10	5	10	3.8	%	**P**
12	DAS Voltage average error	P	12	0.003	35	0.0003	V	**P**
13	Shelter Temperature average error	P	5	2	18	0.77	c	**P**
14	Shelter Temperature max error	P	5	2	18	1.8	c	**P**

SiteVisitDate	Site	Technician
08/07/2018	MEV405	Martin Valvur

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

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

2 **Parameter:** ShelterCleanNotes

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

3 **Parameter:** PollAnalyzerCom

There were fires in the area during the audit. There was a larger than normal pressure drop across the ozone sample inlet filter. Some tests were performed that indicated that nearly all ozone loss was due to the sample inlet filter and holder assembly.

EEMS Spot Report

Data Compiled: 12/6/2018 1:07:52 PM

SiteVisitDate	Site	Technician
08/20/2018	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	6	0.14	c	**P**
2	Temperature max error	P	4	0.5	6	0.22	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98818	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.13975	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.1	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	0.47	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-0.12	ppb	**P**
9	Ozone % difference max	P	7	10	4	1.5	%	**P**
10	Flow Rate average % difference	P	10	5	4	0.88	%	**P**
11	Flow Rate max % difference	P	10	5	4	1.32	%	**P**
12	DAS Voltage average error	P	7	0.003	63	0.0001	V	**P**
13	Shelter Temperature average error	P	5	2	15	0.48	c	**P**
14	Shelter Temperature max error	P	5	2	15	0.70	c	**P**

SiteVisitDate	Site	Technician
08/20/2018	MKG113	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.

2 **Parameter:** Flow Rate **SensorComponent:** Moisture Present **CommentCode** 204

There is moisture present in the dry deposition sample train inside the shelter.

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 increasing on walls and floor.

EEMS Spot Report

Data Compiled: 7/17/2018 10:37:29 AM

SiteVisitDate	Site	Technician
07/03/2018	NPT006	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.25	c	**P**
2	Temperature max error	P	4	0.5	6	0.28	c	**P**
3	Ozone Slope	**B**	0	1.1	4	1.04884	unitless	**P**
4	Ozone Slope	P	0	1.1	4	1.04884	unitless	**P**
5	Ozone Intercept	P	0	5	4	-0.23783	ppb	**P**
6	Ozone Intercept	P	0	5	4	-0.23783	ppb	**P**
7	Ozone correlation	**B**	0	0.995	4	0.99999	unitless	**P**
8	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
9	Ozone % difference avg	P	7	10	4	4.5	%	**P**
10	Ozone % difference max	P	7	10	4	5.0	%	**P**
11	Flow Rate average % difference	P	10	5	2	1.66	%	**P**
12	Flow Rate max % difference	P	10	5	2	2.04	%	**P**
13	Shelter Temperature average error	P	5	2	6	0.37	c	**P**
14	Shelter Temperature max error	P	5	2	6	0.47	c	**P**

SiteVisitDate	Site	Technician
07/03/2018	NPT006	Martin Valvur

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

Site is located in wooded mountainous area.

EEMS Spot Report

Data Compiled: 12/3/2018 9:07:34 AM

SiteVisitDate	Site	Technician
08/01/2018	PAR107	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	0.99060	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.75436	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.6	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.5	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.08	ppb	**P**
7	Ozone % difference max	P	7	10	4	7.3	%	**P**

EEMS Spot Report

Data Compiled: 12/3/2018 8:46:59 AM

SiteVisitDate	Site	Technician
07/30/2018	PED108	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	0.99518	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.86871	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.87	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.66	ppb	**P**
7	Ozone % difference max	P	7	10	4	4.3	%	**P**

EEMS Spot Report

Data Compiled: 12/3/2018 8:39:19 AM

SiteVisitDate	Site	Technician
07/23/2018	PND165	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	0.97782	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.04803	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.9	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.43	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.46	ppb	**P**
7	Ozone % difference max	P	7	10	4	3.6	%	**P**

EEMS Spot Report

Data Compiled: 12/4/2018 9:48:10 PM

SiteVisitDate	Site	Technician
09/17/2018	PRK134	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01014	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.05475	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.8	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	0.09	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.14	ppb	**P**
7	Ozone % difference max	P	7	10	4	1.2	%	**P**

EEMS Spot Report

Data Compiled: 12/4/2018 10:59:07 AM

SiteVisitDate	Site	Technician
08/22/2018	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	12	0.09	c	**P**
2	Temperature max error	P	4	0.5	12	0.14	c	**P**
3	Ozone Slope	P	0	1.1	4	0.97946	unitless	**P**
4	Ozone Intercept	P	0	5	4	-1.22536	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99981	unitless	**P**
6	Ozone % difference avg	P	7	10	4	5.7	%	**P**
7	Ozone Absolute Difference g1	P	7	3	1	-0.75	ppb	**P**
8	Ozone Absolute Difference g2	P	7	1.5	1	-1.13	ppb	**P**
9	Ozone % difference max	P	7	10	4	7.7	%	**P**
10	Flow Rate average % difference	P	10	5	2	2.8	%	**P**
11	Flow Rate max % difference	P	10	5	2	3.85	%	**P**
12	DAS Voltage average error	P	7	0.003	63	0.0001	V	**P**
13	Shelter Temperature average error	P	5	2	15	0.32	c	**P**
14	Shelter Temperature max error	P	5	2	15	0.44	c	**P**

SiteVisitDate	Site	Technician
08/22/2018	PSU106	Sandy Grenville

Field Performance Comments

1 **Parameter:** Flow Rate **SensorComponent:** Leak Test **CommentCode** 206

The flow rate leak test performed at the flow rate standard indicates that the filter pack quick-disconnect fitting is not properly sealing and leaking when a filter is installed.

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:** PollAnalyzerCom

The zero air desiccant is saturated.

6 **Parameter:** MetOpMaintCom

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

EEMS Spot Report

Data Compiled: 12/4/2018 9:08:31 PM

SiteVisitDate	Site	Technician
09/12/2018	UVL124	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	15	0.04	c	**P**
2	Temperature max error	P	4	0.5	15	0.10	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98778	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.12076	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.0	%	**P**
7	Ozone Absolute Difference g2	P	7	1.5	1	-0.45	ppb	**P**
8	Ozone % difference max	P	7	10	4	3.0	%	**P**
9	Flow Rate average % difference	P	10	5	4	25.74	%	**Fail**
10	Flow Rate max % difference	P	10	5	4	26.11	%	**Fail**
11	DAS Voltage average error	P	7	0.003	70	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	15	0.22	c	**P**
13	Shelter Temperature max error	P	5	2	15	0.42	c	**P**

SiteVisitDate	Site	Technician
09/12/2018	UVL124	Sandy Grenville

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The SSRF indicates that the ozone inlet filter is changed weekly rather than every two weeks as is performed.

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.

3 **Parameter:** SiteOpsProcedures

Ozone sample train leak-check performed every two weeks.

4 **Parameter:** SitingCriteriaCom

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

5 **Parameter:** ShelterCleanNotes

The shelter is clean and in good condition.

6 **Parameter:** MetOpMaintCom

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

EEMS Spot Report

Data Compiled: 12/3/2018 8:55:34 AM

SiteVisitDate	Site	Technician
07/31/2018	VPI120	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00707	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.63289	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.1	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.72	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-0.41	ppb	**P**
7	Ozone % difference max	P	7	10	4	2.8	%	**P**

EEMS Spot Report

Data Compiled: 12/2/2018 3:13:22 PM

SiteVisitDate	Site	Technician
07/05/2018	YEL408	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	1.09919	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.95554	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	6.7	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.64	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	0.41	ppb	**P**
7	Ozone % difference max	P	7	10	4	9.3	%	**P**

Field Performance Comments

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

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

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
YEL408-Martin Valvur-07/05/2018						
1	7/5/2018	DAS	Environmental Sys Corp	None	8832	A4888K
2	7/5/2018	Ozone	ThermoElectron Inc	none	49i A3NAA	1172090002
3	7/5/2018	Ozone Standard	ThermoElectron Inc	none	49i A1NAB	0926938297
4	7/5/2018	Zero air pump	Werther International	none	PC 70/4	000836215

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1172090002	YEL408	Martin Valvur	07/05/2018	Ozone	none

Slope:	1.09919	**Slope:**	0.00000
Intercept	-0.95554	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.20	0.24	-0.40	ppb		-0.64
primary	2	15.04	14.97	15.38	ppb		0.41
primary	3	34.98	34.75	37.30	ppb	7.08	
primary	4	65.00	64.53	69.41	ppb	7.29	
primary	5	109.01	108.19	118.30	ppb	8.93	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.7	pass
Span	1.002	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	75.5 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	565.8 mmHg	pass
Cell A Tmp.	33.1 C	pass
Cell B Freq.	56.2 kHz	Fail
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	565.2 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	YEL408	Martin Valvur	07/05/2018	Cell B Freq.	ThermoElectron	4436	☐	☑

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*
GLR468-Martin Valvur-07/06/2018						
1	7/6/2018	DAS	Environmental Sys Corp	90647	8816	2560
2	7/6/2018	Ozone	ThermoElectron Inc	none	49i A3NAA	1023943901
3	7/6/2018	Ozone Standard	ThermoElectron Inc	none	49i A3NAA	0733726104
4	7/6/2018	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	07/06/2018	Ozone	none

Slope:	1.01182	**Slope:**	0.00000
Intercept	0.37141	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.20	0.24	0.88	ppb		0.64
primary	2	15.04	14.97	15.15	ppb		0.18
primary	3	34.48	34.25	35.29	ppb	2.99	
primary	4	66.99	66.50	67.33	ppb	1.24	
primary	5	110.10	109.27	111.10	ppb	1.66	

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	1.007	pass
Zero Voltage	0.000	pass
Fullscale Voltage	0.9999	pass
Cell A Freq.	71.3 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.57 lpm	pass
Cell A Pressure	672.6 mmHg	pass
Cell A Tmp.	38.3 C	pass
Cell B Freq.	62.3 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.56 lpm	pass
Cell B Pressure	672.3 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*
PND165-Martin Valvur-07/23/2018						
1	7/23/2018	DAS	Campbell	000403	CR3000	2516
2	7/23/2018	Ozone	ThermoElectron Inc	000619	49i A1NAA	1009241791
3	7/23/2018	Ozone Standard	ThermoElectron Inc	000435	49i A3NAA	CM08200011
4	7/23/2018	Zero air pump	Werther International	06881	C 70/4	000815264

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241791	PND165	Martin Valvur	07/23/2018	Ozone	000619

Slope:	0.97782	**Slope:**	0.00000
Intercept	-0.04803	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.11	0.16	0.59	ppb		0.43
primary	2	13.82	13.76	13.30	ppb		-0.46
primary	3	37.52	37.27	35.94	ppb	-3.63	
primary	4	67.35	66.86	65.14	ppb	-2.61	
primary	5	115.90	115.03	112.70	ppb	-2.05	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.6	pass
Span	1.033	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	105.9 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	567.7 mmHg	pass
Cell A Tmp.	38.3 C	pass
Cell B Freq.	94.2 kHz	pass
Cell B Noise	0.3 ppb	pass
Cell B Flow	0.67 lpm	pass
Cell B Pressure	567.1 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*
PED108-Sandy Grenville-07/30/2018						
1	7/30/2018	DAS	Campbell	000406	CR3000	2511
2	7/30/2018	Ozone	ThermoElectron Inc	000732	49i A1NAA	1105347319
3	7/30/2018	Ozone Standard	ThermoElectron Inc	000214	49i A3NAA	0622717855
4	7/30/2018	Zero air pump	Werther International	06883	C 70/4	000815257

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347319	PED108	Sandy Grenville	07/30/2018	Ozone	000732

Slope:	0.99518	**Slope:**	0.00000
Intercept	-0.86871	**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	1.00470	**Intercept**	0.08880
Cert Date	6/12/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.40	0.30	-0.57	ppb		-0.87
primary	2	15.60	15.43	14.77	ppb		-0.66
primary	3	35.50	35.24	34.01	ppb	-3.55	
primary	4	67.70	67.29	65.80	ppb	-2.24	
primary	5	109.70	109.09	107.90	ppb	-1.1	

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	0.996	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	84.7 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.63 lpm	pass
Cell A Pressure	709.9 mmHg	pass
Cell A Tmp.	35.9 C	pass
Cell B Freq.	101.3 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.55 lpm	pass
Cell B Pressure	709.6 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*
VPI120-Sandy Grenville-07/31/2018						
1	7/31/2018	DAS	Campbell	000402	CR3000	2514
2	7/31/2018	Ozone	ThermoElectron Inc	000690	49i A1NAA	1030244800
3	7/31/2018	Ozone Standard	ThermoElectron Inc	000443	49i A3NAA	CM08200019
4	7/31/2018	Zero air pump	Werther International	06886	C 70/4	000815259

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244800	VPI120	Sandy Grenville	07/31/2018	Ozone	000690

Slope:	1.00707	**Slope:**	0.00000
Intercept	-0.63289	**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	1.00470	**Intercept**	0.08880
Cert Date	6/12/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.50	0.40	-0.32	ppb		-0.72
primary	2	15.00	14.84	14.43	ppb		-0.41
primary	3	35.30	35.04	34.74	ppb	-0.86	
primary	4	67.80	67.39	67.05	ppb	-0.51	
primary	5	110.00	109.39	109.60	ppb	0.19	

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	1.026	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	84.5 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	656.9 mmHg	pass
Cell A Tmp.	32.1 C	pass
Cell B Freq.	71.3 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.66 lpm	pass
Cell B Pressure	656.3 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*
PAR107-Sandy Grenville-08/01/2018						
1	8/1/2018	DAS	Campbell	000333	CR3000	2112
2	8/1/2018	Ozone	ThermoElectron Inc	000689	49i A1NAA	1030244802
3	8/1/2018	Ozone Standard	ThermoElectron Inc	000436	49i A3NAA	CM08200012
4	8/1/2018	Zero air pump	Werther International	06876	C 70/4	000814286

EEMS Spot Report

Data Compiled: 12/3/2018 9:07:34 AM

SiteVisitDate	Site	Technician
08/01/2018	PAR107	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	0.99060	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.75436	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.6	%	**P**
5	Ozone Absolute Difference g1	P	7	3	1	-0.5	ppb	**P**
6	Ozone Absolute Difference g2	P	7	1.5	1	-1.08	ppb	**P**
7	Ozone % difference max	P	7	10	4	7.3	%	**P**

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CDR119-Sandy Grenville-08/01/2018						
1	8/1/2018	DAS	Campbell	None	CR3000	4935
2	8/1/2018	Ozone	ThermoElectron Inc	000623	49i A1NAA	1009241790
3	8/1/2018	Ozone Standard	ThermoElectron Inc	000365	49i A3NAA	0726124688
4	8/1/2018	Zero air pump	Werther International	06903	C 70/4	000899159

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241790	CDR119	Sandy Grenville	08/01/2018	Ozone	000623

Slope:	0.98984	**Slope:**	0.00000
Intercept	-0.45756	**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	1.00470	**Intercept**	0.08880
Cert Date	6/12/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.70	0.60	0.31	ppb		-0.29
primary	2	15.30	15.14	14.45	ppb		-0.69
primary	3	35.10	34.84	33.90	ppb	-2.73	
primary	4	68.00	67.59	66.40	ppb	-1.78	
primary	5	110.00	109.39	107.90	ppb	-1.37	

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	1.009	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	87.9 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.67 lpm	pass
Cell A Pressure	705.9 mmHg	pass
Cell A Tmp.	31.5 C	pass
Cell B Freq.	89.0 kHz	pass
Cell B Noise	0.8 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

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CKT136-Sandy Grenville-08/02/2018						
1	8/2/2018	DAS	Campbell	000354	CR3000	2132
2	8/2/2018	Ozone	ThermoElectron Inc	000744	49i A1NAA	1105347324
3	8/2/2018	Ozone Standard	ThermoElectron Inc	000200	49i A3NAA	0607315738
4	8/2/2018	Zero air pump	Werther International	06902	PC70/4	000829157

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347324	CKT136	Sandy Grenville	08/02/2018	Ozone	000744

Slope:	0.98748	**Slope:**	0.00000
Intercept	-0.32891	**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	1.00470	**Intercept**	0.08880
Cert Date	6/12/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.90	0.80	0.52	ppb		-0.28
primary	2	15.10	14.94	14.45	ppb		-0.49
primary	3	34.90	34.64	33.60	ppb	-3.05	
primary	4	68.00	67.59	66.70	ppb	-1.33	
primary	5	110.00	109.39	107.60	ppb	-1.65	

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	1.008	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	94.6 kHz	pass
Cell A Noise	Not tested	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	706.9 mmHg	pass
Cell A Tmp.	36.3 C	pass
Cell B Freq.	93.3 kHz	pass
Cell B Noise	Not tested	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

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MCK131-Sandy Grenville-08/03/2018						
1	8/3/2018	DAS	Campbell	000429	CR3000	2535
2	8/3/2018	Ozone	ThermoElectron Inc	000723	49i A1NAA	1105347327
3	8/3/2018	Ozone Standard	ThermoElectron Inc	000366	49i A3NAA	0726124695
4	8/3/2018	Zero air pump	Werther International	06912	PC70/4	000829177

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347327	MCK131	Sandy Grenville	08/03/2018	Ozone	000723

Slope:	0.99623	**Slope:**	0.00000
Intercept	-0.77359	**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	1.00470	**Intercept**	0.08880
Cert Date	6/12/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.30	0.21	-0.58	ppb		-0.79
primary	2	15.00	14.84	13.90	ppb		-0.94
primary	3	34.50	34.25	33.55	ppb	-2.06	
primary	4	67.50	67.09	65.99	ppb	-1.65	
primary	5	110.00	109.39	108.20	ppb	-1.09	

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.30	pass
Span	1.031	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.2 kHz	pass
Cell A Noise	1.0 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	724.7 mmHg	pass
Cell A Tmp.	35.1 C	pass
Cell B Freq.	92.8 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.73 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*
MCK231-Sandy Grenville-08/03/2018						
1	8/3/2018	DAS	Campbell	000359	CR3000	2137
2	8/3/2018	Ozone	ThermoElectron Inc	000682	49i A1NAA	1030244796
3	8/3/2018	Ozone Standard	ThermoElectron Inc	000433	49i A3NAA	CM08200009
4	8/3/2018	Zero air pump	Werther International	06924	C 70/4	000836205

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244796	MCK231	Sandy Grenville	08/03/2018	Ozone	000682

Slope:	0.98809	**Slope:**	0.00000
Intercept	-0.56309	**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	1.00470	**Intercept**	0.08880
Cert Date	6/12/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.80	0.70	0.07	ppb		-0.63
primary	2	15.00	14.84	14.31	ppb		-0.53
primary	3	35.00	34.74	33.64	ppb	-3.22	
primary	4	68.00	67.59	66.12	ppb	-2.2	
primary	5	109.90	109.29	107.50	ppb	-1.65	

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	1.017	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	90.2 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.69 lpm	pass
Cell A Pressure	709.4 mmHg	pass
Cell A Tmp.	36.0 C	pass
Cell B Freq.	87.0 kHz	pass
Cell B Noise	0.4 ppb	pass
Cell B Flow	0.72 lpm	pass
Cell B Pressure	709.7 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*
CNT169-Martin Valvur-08/30/2018						
1	8/30/2018	DAS	Campbell	000417	CR3000	2515
2	8/30/2018	Ozone	ThermoElectron Inc	000620	49i A1NAA	1009241793
3	8/30/2018	Ozone Standard	ThermoElectron Inc	000687	49i A3NAA	1030244809
4	8/30/2018	Zero air pump	Werther International	06925	C 70/4	000836220

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241793	CNT169	Martin Valvur	08/30/2018	Ozone	000620

Slope:	1.03442	**Slope:**	0.00000
Intercept	-0.47485	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

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

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.20	0.24	0.16	ppb		-0.08
primary	2	14.80	14.73	14.65	ppb		-0.08
primary	3	34.93	34.70	34.94	ppb	0.69	
primary	4	65.24	64.77	66.62	ppb	2.82	
primary	5	110.52	109.69	113.10	ppb	3.06	

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	1.011	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	98.6 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.60 lpm	pass
Cell A Pressure	507.4 mmHg	pass
Cell A Tmp.	34.8 C	pass
Cell B Freq.	102.3 kHz	pass
Cell B Noise	0.5 ppb	pass
Cell B Flow	0.59 lpm	pass
Cell B Pressure	506.7 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*
PRK134-Sandy Grenville-09/17/2018						
1	9/17/2018	DAS	Campbell	000411	CR3000	2509
2	9/17/2018	Ozone	ThermoElectron Inc	000693	49i A1NAA	1030244806
3	9/17/2018	Ozone Standard	ThermoElectron Inc	000369	49i A3NAA	0726124690
4	9/17/2018	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	1030244806	PRK134	Sandy Grenville	09/17/2018	Ozone	000693

Slope:	1.01014	**Slope:**	0.00000
Intercept	-0.05475	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	1180030022	**Tfer Desc.**	Ozone primary stan
Tfer ID	01114		
Slope	1.00290	**Intercept**	0.10980
Cert Date	9/7/2018	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.0%	0.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	RelPerDif	AbsDif
primary	1	0.20	0.08	0.17	ppb		0.09
primary	2	15.14	14.98	15.12	ppb		0.14
primary	3	35.62	35.40	35.68	ppb	0.79	
primary	4	67.71	67.40	67.60	ppb	0.3	
primary	5	109.71	109.28	110.60	ppb	1.2	

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	1.008	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	99.2 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	698.4 mmHg	pass
Cell A Tmp.	33.9 C	pass
Cell B Freq.	101.3 kHz	pass
Cell B Noise	1.1 ppb	pass
Cell B Flow	0.71 lpm	pass
Cell B Pressure	697.8 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass