2017 – 1st Quarter Report
Support for Conducting Systems & Performance Audits of CASTNET Sites and NADP Monitoring Stations

EPA Contract No. EPW12019

Prepared for:

U. S. Environmental Protection Agency

Prepared by:

environmental engineering
& measurement services, inc.

1128 NW 39th Drive
Gainesville, FL 32605

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List of Acronyms and Abbreviations

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

1.0 CASTNET Quarterly Report

1.1 Introduction

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

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

CASTNET pollutant flux estimates are calculated as the aggregate product of weekly measured chemical concentrations and model-estimated deposition velocities. Currently, the National Oceanic and Atmospheric Administration's multilayer inferential model (NOAA-MLM) described by Meyers et al. [1998] is used to derive deposition velocity estimates.

As of April 2017, the network is comprised of 95 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), Environment Canada, Bureau of Land Management (BLM) and several independent partners. AMEC Foster Wheeler (AMEC) is responsible for operating the EPA and Environment Canada sponsored sites, and Air Resource Specialist, Inc. (ARS) is responsible for operating the NPS and BLM sponsored sites.

1.2 Project Objectives

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

Performance audits verify that all evaluated variables are consistent with the accuracy goals as defined in the CASTNET Quality Assurance Project Plan (QAPP). The parameter specific accuracy goals are presented in Table 1. Only four EPA sponsored sites that are operated by AMEC continue to operate meteorological sensors. Those sites are BEL116, BVL30, CHE185,

and PAL190. Five new sites in WY sponsored by EPA and operated by the BLM/ARS also operate meteorological sensors and are BAS601, NEC602, BUF603, FOR604, and SHE604. The meteorological sensors at site PAL190 were audited during the station audit performed in first quarter 2017.

Some or all of the additional monitored variables, NOy, CO, and SO_2 have been added to the EPA sponsored sites BVL130, HWF187, PND165, PNF126, GRS420, MAC426, ROM206, and BEL116. None of those variables were audited during first quarter 2017.

Table 1. Performance Audit Challenge and Acceptance Criteria

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Precipitation	Response	10 manual tips	1 DAS count per tip
Precipitation	Accuracy	2 introductions of known amounts of water	≤ ±10.0% of input amount
Relative Humidity	Accuracy	Compared to reference instrument or standard solution	≤ ±10.0% RH
Solar Radiation	Accuracy	Compared to WRR traceable standard	≤ ±10.0% of daytime average
Surface Wetness	Response	Distilled water spray mist	Positive response
Surface Wetness	Sensitivity	1% decade resistance	N/A
Temperature	Accuracy	Comparison to 3 NIST measured baths (~ 0° C, ambient, ~ full-scale)	≤ ± 0.5° C
Temperature Difference	Accuracy	Comparison to station temperature sensor	≤ ± 0.50° C
Shelter Temperature	Accuracy	Comparison to station temperature sensor	≤ ± 2.0° C
Wind Direction	Orientation Accuracy	Parallel to alignment rod/crossarm, or sighted to distant point	≤ ±5° from degrees true
Wind Direction	Linearity	Eight cardinal points on test fixture	≤ ±5° mean absolute error
Wind Direction	Response Threshold	Starting torque tested with torque gauge	< 10 g-cm Climatronics; < 20 g-cm R.M. Young
Wind Speed	Accuracy	Shaft rotational speed generated and measured with certified synchronous motor	≤ ±0.5 mps below 5.0 mps input; ≤ ±5.0% of input at or above 5.0 mps
Wind Speed	Starting Threshold	Starting torque tested with torque gauge	< 0.5 g-cm

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

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

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

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

1.3 CASTNET Sites Visited First Quarter 2017

This report consists of the systems and performance and other audit results from the CASTNET sites visited during the first quarter (January through March) of 2017. 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
CVL151	Without met	EPA	2/21/2017	Coffeeville
PAL190	With met	EPA	2/27/2017	Palo Duro
BBE401	Without met	NPS	3/2/3017	Big Bend NP
CKT136	Without met	EPA	3/14/2017	Crockett
EVE419	Flow only	NPS	3/15/2017	Everglades NP
MCK131	Without met	EPA	3/15/2017	Mackville
MCK231	Without met	EPA	3/15/2017	Mackville (precision site)
ALC188	Without met	EPA	3/28/2017	Alabama-Coushatta

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
SUM156	Ozone	EPA	2/23/2017	Sumatra
SND152	Ozone	EPA	2/27/2017	Sand Mountain
GAS153	Ozone	EPA	2/28/2017	Georgia Station
SPD111	Ozone	EPA	3/13/2017	Speedwell
ESP127	Ozone	EPA	3/16/2017	Edgar Evins St. Park
IRL141	Ozone	EPA	3/17/2017	Sebastian Inlet
COW137	Ozone	EPA	3/23/2017	Coweeta

1.4 Audit Results

The observations and results of the systems and performance audits are included in Appendix A, *CASTNET Audit Report Forms* by site, arranged by audit date.

Photographs of site conditions are included within each systems report where necessary.

Copies of the spot reports that were sent immediately following the audit of each site are included as Appendix B, *CASTNET Site Spot Report Forms.*

The Ozone PE results and observations are included in Appendix C, *CASTNET Ozone Performance Evaluation Forms.*

2.0 NADP Quarterly Report

2.1 Introduction

The National Atmospheric Deposition Program (NADP) operates three precipitation chemistry networks and two atmospheric concentration networks. The National Trends Network (NTN) has been measuring acidic precipitation since 1978. The network currently has more than 250 sites. The Atmospheric Integrated Research Monitoring Network (AIRMoN) began operation in 1992 and currently measures event based precipitation events at 6 sites. The Mercury Deposition Network (MDN) measures total mercury in precipitation samples from more than 120 stations. The MDN began operation in 1996 and includes sites throughout the US and Canada. The Atmospheric Mercury Network (AMNet) and the Ammonia Monitoring Network (AMoN) measure ambient concentrations of mercury and ammonia, respectively.

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

The NADP Program Office operates and administers the three precipitation chemistry networks (NTN, MDN and AIRMoN), two atmospheric concentration networks (AMNet and AMoN), two analytical laboratories (the Central Analytical Laboratory (CAL) located at the University of Illinois/Illinois State Water Survey and the Mercury Analytical Laboratory (HAL) located at Frontier Global Sciences), and the network equipment depot (NED).

2.2 Project Objectives

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

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

2.3 NADP Sites Visited First Quarter 2017

This report covers the results from the NADP sites surveyed during the first quarter (January through March) of 2017. The station names and dates of the audits are presented in Table 4.

Table 4. Sites Surveyed – First Quarter 2017

Side ID	Network	Visit Date	Station Name
AL99	NTN / AMoN	2/27/2017	Sand Mountain Research & Extension Center
GA41	NTN / AMoN	2/28/2017	Georgia Station
LA30	NTN	3/27/2017	Southeast Research Station
MS10	NTN	2/22/2017	Clinton
MS19	NTN	2/22/2017	Newton
MS30	NTN	2/21/2017	Coffeeville
OK17	NTN	3/31/2017	Kessler Farm Field Laboratory
TX02	NTN	3/1/2017	Muleshoe National Wildlife Refuge
TX03	NTN	3/29/2017	Beeville
TX04	NTN	3/2/2017	Big Bend National Park
TX10	NTN	3/28/2017	Attwater Prairie Chicken
TX16	NTN	3/30/2017	Sonora
TX43	NTN / AMoN	2/27/2017	Canonceta
TX56	NTN	3/31/2017	LBJ Grassland

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*
CVL151-Sandy Grenville-02/21/2017						
1	2/21/2017	Computer	Dell	07033	Inspiron 15	Unknown
2	2/21/2017	DAS	Campbell	000410	CR3000	2508
3	2/21/2017	Elevation	Elevation	None	1	None
4	2/21/2017	Filter pack flow pump	Thomas	04282	107CAB18B	129800010140
5	2/21/2017	Flow Rate	Apex	000640	AXMC105LPMDPCV	54779
6	2/21/2017	Infrastructure	Infrastructure	none	none	none
7	2/21/2017	Modem	Raven	06462	V42221	0808338333
8	2/21/2017	Ozone	ThermoElectron Inc	000698	49i A1NAA	1030244797
9	2/21/2017	Ozone Standard	ThermoElectron Inc	000464	49i A3NAA	0622717858
10	2/21/2017	Sample Tower	Aluma Tower	03540	A	none
11	2/21/2017	Shelter Temperature	Campbell	none	107-L	none
12	2/21/2017	Siting Criteria	Siting Criteria	None	1	None
13	2/21/2017	Temperature	RM Young	04447	41342	4545
14	2/21/2017	Zero air pump	Werther International	06884	PC70/4	000815263

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2508	CVL151	Sandy Grenville	02/21/2017	DAS	Primary

Das Date: 2 /21/2017
Das Time: 18:16:00
Das Day: 52

Audit Date 2 /21/2017
Audit Time 18:16:00
Audit Day 52

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/23/2017	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2998	0.2997	V	V	-0.0001
7	0.5000	0.4996	0.4996	V	V	0.0000
7	0.7000	0.6995	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	54779	CVL151	Sandy Grenville	02/21/2017	Flow Rate	000640

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
1.75%	1.96%			

Cal Factor Zero	0.03
Cal Factor Full Scale	1.02
Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.00	0.000	0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.03	l/m	l/m	
primary	test pt 1	1.527	1.520	1.48	0.000	1.50	l/m	l/m	-1.32%
primary	test pt 2	1.531	1.530	1.48	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.528	1.530	1.48	0.000	1.50	l/m	l/m	-1.96%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244797	CVL151	Sandy Grenville	02/21/2017	Ozone	000698

Slope:	1.00250	**Slope:**	0.00000
Intercept	0.49278	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00879	**Intercept**	0.36382
Cert Date	2/8/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.1%	2.6%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	-0.35	0.43	ppb	
primary	2	14.92	14.42	14.48	ppb	0.42%
primary	3	35.39	34.72	35.62	ppb	2.59%
primary	4	70.02	69.04	69.43	ppb	0.56%
primary	5	110.11	108.78	109.68	ppb	0.83%

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	1.020	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.4 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.65 lpm	pass
Cell A Pressure	723.2 mmHg	pass
Cell A Tmp.	37.8 C	pass
Cell B Freq.	99.3 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.62 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4545	CVL151	Sandy Grenville	02/21/2017	Temperature	04447

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00759	**Intercept**	0.14754
Cert Date	2/4/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.02	0.04		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.24	0.09	0.000	0.1	C	-0.04
primary	Temp Mid Range	26.05	25.71	0.000	25.7	C	0.02
primary	Temp High Range	49.18	48.66	0.000	48.7	C	0

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

Infrastructure Data For

Site ID	Technician	Site Visit Date
CVL151	Sandy Grenville	02/21/2017

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CVL151	Sandy Grenville	02/21/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.36	0.41		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00759	Intercept	0.14754
Cert Date	2/4/2017	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	24.39	24.06	0.000	23.8	C	-0.26
primary	Temp Mid Range	25.26	24.92	0.000	24.5	C	-0.41
primary	Temp Mid Range	27.35	27.00	0.000	26.6	C	-0.41

Sensor Component	System Memo	Condition		Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	CVL151	Sandy Grenville	02/21/2017	Moisture Present	Apex	3446	☐	☐

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

Field Systems Comments

1 **Parameter:** DasComments

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

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

The shelter is somewhat cluttered. The shelter roof is still leaking and the walls are rotten at the seams and corners. The shelter is in poor condition.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CVL151	**Technician**	Sandy Grenville	**Site Visit Date**	02/21/2017

Site Sponsor (agency)	EPA	**USGS Map**	Coker Lake
Operating Group	Private - USFS	**Map Scale**	
AQS #	28-161-9991	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	34.0028
Deposition Measurement	dry, wet	**QAPP Longitude**	-89.7989
Land Use	woodland - evergreen	**QAPP Elevation Meters**	134
Terrain	rolling	**QAPP Declination**	0.2
Conforms to MLM	Marginally	**QAPP Declination Date**	2/22/2006
Site Telephone	(662) 623-7334	**Audit Latitude**	34.002747
Site Address 1	Forest Road 809	**Audit Longitude**	-89.799183
Site Address 2	Tombigbee National Forest	**Audit Elevation**	138
County	Yalobusha	**Audit Declination**	-0.95
City, State	Tillatoba, MS		
Zip Code	38961	**Fire Extinguisher** ☑	New in 2015
Time Zone	Central	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is somewhat cluttered. The shelter roof is still leaking and the walls are rotten at the seams and corners. The shelter is in poor condition.				
Site OK	☑	**Notes**					

Driving Directions

From interstate 55 take exit 220 east on highway 330. Continue approximately 5 miles and turn left (north) at the Forest Service sign for the Yalobusha County Work Center and Jamie L. Whitter Plant Materials Center. Immediately after the facility turn left on forest service road 802. Continue approximately 1.5 miles to the stop sign and turn left on road 809. Continue approximately 0.3 miles to the first road on the left.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/21/2017

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

Siting Distances OK ☐

Siting Criteria Comment

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

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/21/2017

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 CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/21/2017

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 CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/21/2017

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?	☐	17 meters

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 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 CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/21/2017

DAS, sensor translators, and peripheral equipment operations and maintenance

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

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

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

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

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/21/2017

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	☑	June 2007	☐
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	CVL151	Technician	Sandy Grenville	Site Visit Date	02/21/2017

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?	☐	
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)	☐		☑
Manual Rain Gauge Test	☑	N/A	☑
Confirm Reasonableness of Current Values	☑	N/A	☑
Test Surface Wetness Response	☑	N/A	☑

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	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 CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/21/2017

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 CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/21/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07033
DAS	Campbell	CR3000	2508	000410
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	129800010140	04282
Flow Rate	Apex	AXMC105LPMDPC	54779	000640
Infrastructure	Infrastructure	none	none	none
Modem	Raven	V42221	0808338333	06462
Ozone	ThermoElectron Inc	49i A1NAA	1030244797	000698
Ozone Standard	ThermoElectron Inc	49i A3NAA	0622717858	000464
Sample Tower	Aluma Tower	A	none	03540
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	4545	04447
Zero air pump	Werther International	PC70/4	000815263	06884

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
PAL190-Martin Valvur-02/27/2017						
1	2/27/2017	Computer	Dell	07056	Inspiron 15	Unknown
2	2/27/2017	DAS	Campbell	000343	CR3000	2122
3	2/27/2017	Elevation	Elevation	None	1	None
4	2/27/2017	Filter pack flow pump	Thomas	02752	107CA110	11920011905
5	2/27/2017	Infrastructure	Infrastructure	none	none	none
6	2/27/2017	Met tower	Universal Tower	06322	unknown	none
7	2/27/2017	Modem	Raven	06808	H4223-C	0934411667
8	2/27/2017	Ozone	ThermoElectron Inc	000733	49i A1NAA	1105347322
9	2/27/2017	Ozone Standard	ThermoElectron Inc	000735	49i A3NAA	0726124696
10	2/27/2017	Precipitation	Texas Electronics	06307	TR-525i-HT	41276-107
11	2/27/2017	Relative Humidity	Vaisala	05050	HMP50	H0310104
12	2/27/2017	Sample Tower	Aluma Tower	missing	B	AT-7200-582
13	2/27/2017	Shelter Temperature	Campbell	none	107-L	10755-148
14	2/27/2017	Shield (10 meter)	RM Young	06167	Aspirated 43408	none
15	2/27/2017	Shield (2 meter)	RM Young	06166	Aspirated 43408	none
16	2/27/2017	Siting Criteria	Siting Criteria	None	1	None
17	2/27/2017	Solar Radiation	Licor	06737	LI-200	missing
18	2/27/2017	Solar Radiation Translator	RM Young	06633	70101-X	none
19	2/27/2017	Surface Wetness	RM Young	04326	58101	none
20	2/27/2017	Temperature	RM Young	06303	41342VO	12542
21	2/27/2017	Temperature2meter	RM Young	06302	41342VO	12541
22	2/27/2017	Wind Direction	RM Young	04355	AQ05305	35508wdr
23	2/27/2017	Wind Speed	RM Young	04355	AQ05305	35508wsp
24	2/27/2017	Zero air pump	Werther International	06929	C 70/4	000829173

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2122	PAL190	Martin Valvur	02/27/2017	DAS	Primary

Das Date: 2 /27/2017
Das Time: 10:11:00
Das Day: 58

Audit Date 2 /27/2017
Audit Time 10:11:00
Audit Day 58

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/23/2017	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0013	-0.0010	V	V	0.0003
7	0.1000	0.0997	0.0994	V	V	-0.0003
7	0.3000	0.2999	0.2998	V	V	-0.0001
7	0.5000	0.4994	0.4994	V	V	0.0000
7	0.7000	0.6998	0.6998	V	V	0.0000
7	0.9000	0.8995	0.8994	V	V	-0.0001
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	54774	PAL190	Martin Valvur	02/27/2017	Flow Rate	000654

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00153	**Intercept**	0.00366
Cert Date	1/25/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.03
0.98%	1.31%			**Cal Factor Full Scale**	0.97
				Rotometer Reading:	3.1

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	0.02	0.000	-0.02	l/m	l/m	
primary	test pt 1	3.060	3.050	3.00	0.000	3.01	l/m	l/m	-1.31%
primary	test pt 2	3.060	3.050	3.00	0.000	3.01	l/m	l/m	-1.31%
primary	test pt 3	3.030	3.020	3.00	0.000	3.01	l/m	l/m	-0.33%

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**	7.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	90 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347322	PAL190	Martin Valvur	02/27/2017	Ozone	000733

Slope:	0.99023	**Slope:**	0.00000
Intercept	-0.05742	**Intercept**	0.00000
CorrCoff	0.99989	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00466	**Intercept**	0.01298
Cert Date	1/1/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.6%	3.8%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.46	0.44	0.51	ppb	
primary	2	15.85	15.76	15.92	ppb	1.02%
primary	3	36.78	36.59	35.19	ppb	-3.83%
primary	4	69.28	68.94	68.78	ppb	-0.23%
primary	5	104.26	103.76	102.60	ppb	-1.12%

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	1.013	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	89.6 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.0 lpm	Fail
Cell A Pressure	647.5 mmHg	pass
Cell A Tmp.	31.8 C	pass
Cell B Freq.	95.3 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.79 lpm	pass
Cell B Pressure	647.5 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	35508wsp	PAL190	Martin Valvur	02/27/2017	Wind Speed	04355

Mfg	RM Young	**Parameter**	wind speed
Serial Number		**Tfer Desc.**	wind speed motor (h
Tfer ID	01262		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/26/2017	**CorrCoff**	1.00000

Prop or Cups SN 68264
Prop or Cups Torque 0.2 **to** 0.2
Prop Correction Fact 0.0512

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	0.03	0.00%		
Abs Max Er	0.10	0.00%		

UseDescription:	Input Device	Input RPM	Input m/s	Out V	DAS m/s	Diff/ %Diff	Diff	WsM
primary	none	0	0.20	0.0	0.1		-0.10	
primary	01262	200	1.02	0.0	1.0		0.00	
primary	01262	400	2.05	0.0	2.1		0.00	
primary	01262	800	4.10	0.0	4.1		0.00	
primary	01262	1200	6.14	0.0	6.1	0.00%		
primary	01262	2400	12.29	0.0	12.3	0.00%		
primary	01262	4000	20.48	0.0	20.5	0.00%		
primary	01262	9400	48.13	0.0	48.1	0.00%		

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**	Good	**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	35508wdr	PAL190	Martin Valvur	02/27/2017	Wind Direction	04355

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	Ushikata	**Parameter**	wind direction
Serial Number	190037	**Tfer Desc.**	transit
Tfer ID	01265		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/8/2017	**CorrCoff**	1.00000

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

VaneTorque 15 **to** 17 1

	DAS 1: Orientation	DAS 1: Linearity:	DAS 2: Orientation	DAS 2: Linearity:
Abs Avg Err	2.0	1.5		
Abs Max Er	4	3		

UseDescription	TferID	Input Raw	Linearity	Output V	Output Deg.	Difference	Change	Error
primary	01266	0	☑	0.000	0	0	47	2
primary	01266	45	☑	0.000	48	3	48	3
primary	01266	90	☑	0.000	93	3	45	0
primary	01266	135	☑	0.000	137	2	44	-1
primary	01266	180	☑	0.000	180	0	43	-2
primary	01266	225	☑	0.000	223	2	43	-2
primary	01266	270	☑	0.000	267	3	44	-1
primary	01266	315	☑	0.000	313	2	46	1
primary	01265	1	☐	0.000	0	1		1
primary	01265	91	☐	0.000	93	2		2
primary	01265	181	☐	0.000	180	1		1
primary	01265	271	☐	0.000	267	4		4

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

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12542	PAL190	Martin Valvur	02/27/2017	Temperature	06303

Mfg	Fluke	**Parameter**	Temperature
Serial Number	3275143	**Tfer Desc.**	RTD
Tfer ID	01229		
Slope	1.00006	**Intercept**	0.03191
Cert Date	1/23/2017	**CorrCoff**	1.00000

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.11	0.08	0.000	0.08	C	0
primary	Temp Mid Range	25.59	25.56	0.000	25.51	C	-0.05
primary	Temp High Range	46.51	46.48	0.000	46.40	C	-0.08

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

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	12541	PAL190	Martin Valvur	02/27/2017	Temperature2meter	06302

Mfg	Fluke	Parameter	Temperature
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	CorrCoff	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.05	0.06		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.11	0.08	0.000	0.12	C	0.04
primary	Temp Mid Rang	25.59	25.56	0.000	25.50	C	-0.06
primary	Temp High Rang	46.51	46.48	0.000	46.44	C	-0.04

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Shield	Condition	Clean	Status	pass
Sensor Component	Blower	Condition	Not functioning	Status	Fail
Sensor Component	Blower Status Switch	Condition	N/A	Status	pass
Sensor Component	System Memo	Condition	See comments	Status	pass

Humidity Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Vaisala	H0310104	PAL190	Martin Valvur	02/27/2017	Relative Humidity	05050

Mfg	Rotronic	**Parameter**	Relative Humidity
Serial Number	75296	**Tfer Desc.**	GTL
Tfer ID	01220		
Slope	0.99780	**Intercept**	0.06850
Cert Date	1/23/2017	**CorrCoff**	0.99994

	DAS 1:		DAS 2:	
	Low Range	**High Range**	**Low Range**	**High Range**
Abs Avg Err	2.5	6.4		
Abs Max Er	3.2	6.4		

UseDesc.	Test type	Device	Input RH	GTL Raw	RH Corr.	DAS Volts	DAS %RH	Difference
primary	RH Low Range	GTL	32.8	32.2	32.8	0.000	31.3	-1.5
primary	RH Low Range	GTL	52.9	52.8	52.9	0.000	50.1	-2.8
primary	RH Low Range	GTL		17.1	17.1	0.000	20.4	3.2
primary	RH High Range	GTL	93.6	90.3	93.6	0.000	87.2	-6.4

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

Solar Radiation Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Licor	missing	PAL190	Martin Valvur	02/27/2017	Solar Radiation	06737

Mfg	RM Young
SN/Owner ID	none 06633
Parameter	Solar Radiation Translator

Mfg	Eppley	**Parameter**	solar radiation
Serial Number	23824	**Tfer Desc.**	SR transfer sensor
Tfer ID	01247		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/16/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
% Diff of Avg	**%Diff of Max**	**%Diff of Avg**	**%Diff of Max**
16.6%	17.2%	0.0%	0.0%

UseDescription	Measure Date	MeasureTime	Tfer Raw	Tfer Corr	DAS w/m2	PctDifference
primary	2/27/2017	11:00	675	675	801	18.6%
primary	2/27/2017	12:00	754	754	893	18.4%
primary	2/27/2017	13:00	825	825	976	18.3%
primary	2/27/2017	14:00	830	830	972	17.2%
primary	2/27/2017	15:00	778	778	893	14.8%
primary	2/27/2017	16:00	668	668	749	12.1%

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	41276-107	PAL190	Martin Valvur	02/27/2017	Precipitation	06307

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

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	tip check	10 manual	1	2 sec	0.10	0.10	in	in	ml	
primary	test 1	231.5	1	8 sec	0.50	0.49	in	in	ml	-2.0%

Sensor Component	Properly Sited	Condition	Properly sited	Status	pass
Sensor Component	Gauge Drain Screen	Condition	Installed	Status	pass
Sensor Component	Funnel Clean	Condition	Moderately clean	Status	pass
Sensor Component	Condition	Condition	Good	Status	pass
Sensor Component	Gauge Screen	Condition	Installed	Status	pass
Sensor Component	Gauge Clean	Condition	Moderately 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

Surface Wetness Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	none	PAL190	Martin Valvur	02/27/2017	Surface Wetness	04326

Mfg	Ohmite	**Parameter**	surface wetness
Serial Number	296-1200	**Tfer Desc.**	decade box
Tfer ID	01210		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/4/2011	**CorrCoff**	1.00000

☑ **Manual Test Pass**

UseDescription	Test Type	Tfer kOhms	OutputSignal	DAS eng	OutputSignalEngUni	TferUnits	OutputSignalUnit
primary	dry	N/A	0.010	0.01	V	N/A	V
primary	wet	N/A	1.010	1.01	V	N/A	V

Sensor Component	Properly Sited	**Condition**	Properly sited	**Status**	pass
Sensor Component	Grid Clean	**Condition**	Clean	**Status**	pass
Sensor Component	Grid Angle	**Condition**	about 45 deg	**Status**	pass
Sensor Component	Grid Orientation	**Condition**	NW	**Status**	pass
Sensor Component	Grid Condition	**Condition**	Fair	**Status**	pass
Sensor Component	Grid Type	**Condition**	Grid with holes	**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	10755-148	PAL190	Martin Valvur	02/27/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.28	0.35		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.53	21.50	0.000	21.4	C	-0.14
primary	Temp Mid Range	22.77	22.74	0.000	22.4	C	-0.35
primary	Temp Mid Range	20.87	20.84	0.000	21.2	C	0.34

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	PAL190	Technician	Martin Valvur	Site Visit Date	02/27/2017

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

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Ozone	PAL190	Martin Valvur	02/27/2017	Cell A Flow	ThermoElectron	3436	☐	☐
This analyzer diagnostic check is outside the manufacturer's recommended value.								
Temperature	PAL190	Martin Valvur	02/27/2017	System Memo	RM Young	2186	☐	☑
The sensor signal cables are showing signs of wear.								
Temperature2meter	PAL190	Martin Valvur	02/27/2017	System Memo	RM Young	2187	☐	☑
The sensor signal cables are showing signs of wear.								
Temperature2meter	PAL190	Martin Valvur	02/27/2017	Blower	RM Young	2187	☐	☑
The forced-air blower for the shield is not functioning.								

Field Systems Comments

1 **Parameter:** DasComments

The lower temperature sensor is mounted at 1.75 meters above the ground.

2 **Parameter:** SiteOpsProcedures

The ozone sample train is leak tested every two weeks.

3 **Parameter:** SitingCriteriaCom

The site is located 40 km southeast of Amarillo TX which has a population of approximately 178,000.

4 **Parameter:** ShelterCleanNotes

The shelter is in good condition.

5 **Parameter:** MetSensorComme

The surface wetness sensor grid is inclined approximately 45 degrees and is oriented to the northwest.

6 **Parameter:** MetOpMaintCom

The sensor signal cables are in very poor condition. The outer shield is broken and missing in several places. The two meter temperature sensor blower is not functioning.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	PAL190	**Technician**	Martin Valvur	**Site Visit Date**	02/27/2017

Site Sponsor (agency)	EPA	**USGS Map**	Fortress Cliff
Operating Group	TX A&M University	**Map Scale**	
AQS #	48-381-9991	**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	Complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone		**Audit Latitude**	34.88061
Site Address 1		**Audit Longitude**	-101.664703
Site Address 2		**Audit Elevation**	1053
County	Randall	**Audit Declination**	6.6
City, State	Canyon, TX		
Zip Code	79015	**Fire Extinguisher** ☑	No inspection date
Time Zone	Central	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☑	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Shelter One	**Model**	E-8109-26012-2	**Shelter Size**	720 cuft
Shelter Clean	☑	**Notes**	The shelter is in good condition.				
Site OK	☑	**Notes**					

Driving Directions

From I27 take exit 99 and go east on Hungate road to the first stop sign. Turn right (south) onto Eastern which is a dirt road. At the next intersection turn left (east) on Lawrence (also dirt). Continue and follow sharp left turn onto Pullman. Continue and follow sharp right turn onto game lands. Continue through two gates and past storage building. Site will be visible on the left.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID PAL190 **Technician** Martin Valvur **Site Visit Date** 02/27/2017

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

Siting Distances OK ☑

Siting Criteria Comment

The site is located 40 km southeast of Amarillo TX which has a population of approximately 178,000.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	PAL190	Technician	Martin Valvur	Site Visit Date	02/27/2017

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?	☑	NW
11	Is it inclined approximately 30 degrees?	☑	Approximately 45 degrees

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

The surface wetness sensor grid is inclined approximately 45 degrees and is oriented to the northwest.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID PAL190 **Technician** Martin Valvur **Site Visit Date** 02/27/2017

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?**	☐	Temperature only, two meter not functioning
5	**Is the solar radiation sensor's lens clean and free of scratches?**	☑	
6	**Is the surface wetness sensor grid clean and undamaged?**	☑	
7	**Are the sensor signal and power cables intact, in good condition, and well maintained?**	☑	
8	**Are the sensor signal and power cable connections protected from the elements and well maintained?**	☑	

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

The sensor signal cables are in very poor condition. The outer shield is broken and missing in several places. The two meter temperature sensor blower is not functioning.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	PAL190	Technician	Martin Valvur	Site Visit Date	02/27/2017

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 PAL190 **Technician** Martin Valvur **Site Visit Date** 02/27/2017

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:

The lower temperature sensor is mounted at 1.75 meters above the ground.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	PAL190	Technician	Martin Valvur	Site Visit Date	02/27/2017

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2014	☑
HASP	☑	Oct 2014	☑
Field Ops Manual	☐	Oct 2014	☑
Calibration Reports	☑	Electronic copy	☑
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	PAL190	Technician	Martin Valvur	Site Visit Date	02/27/2017

Site operation procedures

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

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

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

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

Provide any additional 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 sample train is leak tested every two weeks.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID PAL190 **Technician** Martin Valvur **Site Visit Date** 02/27/2017

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
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 PAL190 **Technician** Martin Valvur **Site Visit Date** 02/27/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07056
DAS	Campbell	CR3000	2122	000343
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA110	11920011905	02752
Infrastructure	Infrastructure	none	none	none
Met tower	Universal Tower	unknown	none	06322
Modem	Raven	H4223-C	0934411667	06808
Ozone	ThermoElectron Inc	49i A1NAA	1105347322	000733
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124696	000735
Precipitation	Texas Electronics	TR-525i-HT	41276-107	06307
Relative Humidity	Vaisala	HMP50	H0310104	05050
Sample Tower	Aluma Tower	B	AT-7200-582	missing
Shelter Temperature	Campbell	107-L	10755-148	none
Shield (10 meter)	RM Young	Aspirated 43408	none	06167
Shield (2 meter)	RM Young	Aspirated 43408	none	06166
Siting Criteria	Siting Criteria	1	None	None
Solar Radiation	Licor	LI-200	missing	06737
Solar Radiation Translator	RM Young	70101-X	none	06633
Surface Wetness	RM Young	58101	none	04326
Temperature	RM Young	41342VO	12542	06303
Temperature2meter	RM Young	41342VO	12541	06302
Wind Direction	RM Young	AQ05305	35508wdr	04355
Wind Speed	RM Young	AQ05305	35508wsp	04355
Zero air pump	Werther International	C 70/4	000829173	06929

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
BBE401-Martin Valvur-03/02/2017						
1	3/2/2017	Computer	Hewlett Packard	none	6730b	CNU9335N72
2	3/2/2017	DAS	Environmental Sys Corp	90767	8816	4592
3	3/2/2017	Elevation	Elevation	None	1	None
4	3/2/2017	Filter pack flow pump	Thomas	none	107CA18	0688001784
5	3/2/2017	Flow Rate	Alicat	none	Unknown	Unknown
6	3/2/2017	Infrastructure	Infrastructure	none	none	none
7	3/2/2017	Mainframe	Climatronics	01847	100081	1426
8	3/2/2017	Mainframe power supply	Climatronics	none	101074	unknown
9	3/2/2017	Modem	US Robotics	none	56k	22SBB9FA71K4
10	3/2/2017	Ozone	ThermoElectron Inc	90517	49C	49C-58468-318
11	3/2/2017	Ozone Standard	ThermoElectron Inc	90831	49C	0520012325
12	3/2/2017	Printer	Hewlett Packard	none	842C	unknown
13	3/2/2017	Sample Tower	Aluma Tower	none	B	AT-5381-F9-1
14	3/2/2017	Shelter Temperature	ARS	none	none	none
15	3/2/2017	Shield (2 meter)	Climatronics	00390	100325	1275
16	3/2/2017	Siting Criteria	Siting Criteria	None	1	None
17	3/2/2017	Temperature Translator	Climatronics	none	100088-2	482
18	3/2/2017	Temperature2meter	Climatronics	01049	100093	missing
19	3/2/2017	Zero air pump	Werther International	none	PC70/4	606489

DAS Data Form

DAS Time Max Error: 1.27

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	4592	BBE401	Martin Valvur	03/02/2017	DAS	Primary

Das Date: 3 /2 /2017
Das Time: 10:21:14
Das Day: 61

Audit Date 3 /2 /2017
Audit Time 10:22:30
Audit Day 61

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

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740243	**Tfer Desc.**	DVM
Tfer ID	01312		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/23/2017	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
15	0.0000	0.0000	0.0000	V	V	0.0000
15	0.1000	0.0995	0.0994	V	V	-0.0001
15	0.3000	0.2992	0.2994	V	V	0.0002
15	0.5000	0.4995	0.4993	V	V	-0.0002
15	0.7000	0.6993	0.6996	V	V	0.0003
15	0.9000	0.8998	0.8998	V	V	0.0000
15	1.0000	0.9997	0.9999	V	V	0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Alicat	Unknown	BBE401	Martin Valvur	03/02/2017	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	148613	**Tfer Desc.**	BIOS 220-H
Tfer ID	01421		
Slope	1.00153	**Intercept**	0.00366
Cert Date	1/25/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.013
1.06%	1.22%			**Cal Factor Full Scale**	0.001
				Rotometer Reading:	3.1

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignalI	PctDifference
primary	pump off	0.000	0.000	-0.01	0.0000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.0000	-0.01	l/m	l/m	
primary	test pt 1	3.030	3.020	3.00	0.0000	2.99	l/m	l/m	-1.09%
primary	test pt 2	3.030	3.020	3.00	0.0000	2.99	l/m	l/m	-0.86%
primary	test pt 3	3.040	3.030	3.00	0.0000	2.99	l/m	l/m	-1.22%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	7.0 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 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	49C-58468-318	BBE401	Martin Valvur	03/02/2017	Ozone	90517

Slope:	1.00088	**Slope:**	0.00000
Intercept	-0.58293	**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	1.00466	**Intercept**	0.01298
Cert Date	1/1/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.7%	3.8%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.36	0.34	0.01	ppb	
primary	2	18.18	18.08	17.39	ppb	-3.82%
primary	3	40.53	40.32	39.52	ppb	-1.98%
primary	4	74.95	74.58	74.10	ppb	-0.64%
primary	5	112.34	111.80	111.40	ppb	-0.36%

Sensor Component		Condition		Status	
Sensor Component	Sample Train	**Condition**	Good	**Status**	pass
Sensor Component	22.5 degree rule	**Condition**		**Status**	pass
Sensor Component	Inlet Filter Condition	**Condition**	Clean	**Status**	pass
Sensor Component	Battery Backup	**Condition**	N/A	**Status**	pass
Sensor Component	Offset	**Condition**	0.20	**Status**	pass
Sensor Component	Span	**Condition**	1.026	**Status**	pass
Sensor Component	Zero Voltage	**Condition**	-0.0005	**Status**	pass
Sensor Component	Fullscale Voltage	**Condition**	1.0000	**Status**	pass
Sensor Component	Cell A Freq.	**Condition**	109.8 kHz	**Status**	pass
Sensor Component	Cell A Noise	**Condition**	0.5 ppb	**Status**	pass
Sensor Component	Cell A Flow	**Condition**	0.66 lpm	**Status**	pass
Sensor Component	Cell A Pressure	**Condition**	661.4 mmHg	**Status**	pass
Sensor Component	Cell A Tmp.	**Condition**	33.0 C	**Status**	pass
Sensor Component	Cell B Freq.	**Condition**	91.7 kHz	**Status**	pass
Sensor Component	Cell B Noise	**Condition**	0.6 ppb	**Status**	pass
Sensor Component	Cell B Flow	**Condition**	0.69 lpm	**Status**	pass
Sensor Component	Cell B Pressure	**Condition**	661.2 mmHg	**Status**	pass
Sensor Component	Cell B Tmp.	**Condition**		**Status**	pass
Sensor Component	Line Loss	**Condition**	Not tested	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

2 Meter Temperature Data Form

Calc. Difference

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	missing	BBE401	Martin Valvur	03/02/2017	Temperature2meter	01049

Mfg	Climatronics	
SN/Owner ID	482	none
Parameter	Temperature Translator	

Mfg	Fluke	Parameter	Temperature	
Serial Number	3275143	Tfer Desc.	RTD	
Tfer ID	01229			
Slope	1.00006	Intercept	0.03191	
Cert Date	1/23/2017	CorrCoff	1.00000	

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.05	0.07		

UseDescription	Test type	InputTmpRaw	InputTmpCorrected	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Rang	0.06	0.03	0.0000	0.07	C	0.04
primary	Temp Mid Rang	24.93	24.90	0.0000	24.87	C	-0.03
primary	Temp High Rang	48.65	48.62	0.0000	48.55	C	-0.07

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	See comments	Status	pass

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	BBE401	Martin Valvur	03/02/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.36	0.95		

Mfg	Fluke	Parameter	Shelter Temperatur
Serial Number	3275143	Tfer Desc.	RTD
Tfer ID	01229		
Slope	1.00006	Intercept	0.03191
Cert Date	1/23/2017	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	21.14	21.11	0.000	21.0	C	-0.1
primary	Temp Mid Range	21.68	21.65	0.000	21.6	C	-0.03
primary	Temp Mid Range	20.60	20.57	0.000	21.5	C	0.95

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	BBE401	Technician	Martin Valvur	Site Visit Date	03/02/2017

Shelter Make	Shelter Model	Shelter Size
Ekto	8814	896 cuft

Sensor Component		Condition		Status	
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Conduit	Condition	Fair	Status	pass
Sensor Component	Met Tower	Condition	Good	Status	pass
Sensor Component	Moisture Trap	Condition	Not installed	Status	pass
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	Good	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	Poor	Status	Fail
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Temperature2meter	BBE401	Martin Valvur	03/02/2017	System Memo	Climatronics	4293	☐	☑

The sensor signal cables are showing signs of wear.

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone sample line is leak tested once each month when the inlet filter is replaced.

2 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized.

3 **Parameter:** MetSensorComme

The two meter temperature sensor is mounted at 1.6 meters above the ground.

4 **Parameter:** MetOpMaintCom

The signal cables are in poor condition. Photos of the two meter temperature sensor signal cable can be found on the EEMS server.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	BBE401	**Technician**	Martin Valvur	**Site Visit Date**	03/02/2017

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Panther Junction
Operating Group	NPS	**Map Scale**	
AQS #	48-043-0101	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, IMPROVE, PM2.5	**QAPP Latitude**	29.3022
Deposition Measurement	dry, wet	**QAPP Longitude**	-103.1772
Land Use	desert	**QAPP Elevation Meters**	1052
Terrain	complex	**QAPP Declination**	
Conforms to MLM	Marginally	**QAPP Declination Date**	
Site Telephone	(432) 477-2258	**Audit Latitude**	29.302651
Site Address 1	K-Bar Ranch	**Audit Longitude**	-103.177813
Site Address 2	Big Bend National Park	**Audit Elevation**	1057
County	Brewster	**Audit Declination**	7.0
City, State	Big Bend National Park, TX		
Zip Code	79834	**Fire Extinguisher** ☑	Inspected Nov 2009
Time Zone	Central	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☐	
Primary Op. Phone #		**Safety Hard Hat** ☐	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	8814	**Shelter Size**	896 cuft
Shelter Clean	☑	**Notes**	The shelter is clean, neat, and well organized.				
Site OK	☑	**Notes**					

Driving Directions

From interstate 10 in Fort Stockton, turn south on highway 385 and drive approximately 120 miles to Big Bend National Park. Continue on the park road past the entrance station 26 miles to the stop sign at Panther Junction near the visitor center. Turn left (east) and continue approximately 2.5 miles. Turn left on the dirt road marked K-Bar and continue approximately 0.5 miles. Turn right on the service road just past the Chihuahuan Desert Research Station (old house) on the right. The site is 400 meters at the end of the road.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID BBE401 **Technician** Martin Valvur **Site Visit Date** 03/02/2017

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	BBE401	Technician	Martin Valvur	Site Visit Date	03/02/2017

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

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

The two meter temperature sensor is mounted at 1.6 meters above the ground.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	BBE401	Technician	Martin Valvur	Site Visit Date	03/02/2017

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

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

The signal cables are in poor condition. Photos of the two meter temperature sensor signal cable can be found on the EEMS server.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID BBE401 **Technician** Martin Valvur **Site Visit Date** 03/02/2017

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.		1/2 teflon by 12 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☐	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID BBE401 **Technician** Martin Valvur **Site Visit Date** 03/02/2017

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	BBE401	Technician	Martin Valvur	Site Visit Date	03/02/2017

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	☑	Electronic copy	☑
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 and 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 BBE401 **Technician** Martin Valvur **Site Visit Date** 03/02/2017

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	☑	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	☑	Monthly	☑
Automatic Precision Level Tests	☑	Daily	☑
Manual Precision Level Test	☑	Monthly	☑
Analyzer Diagnostics Tests	☐	Alarm values only	☑
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	☐		☐

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

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

The ozone sample line is leak tested once each month when the inlet filter is replaced.

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID	BBE401	Technician	Martin Valvur	Site Visit Date	03/02/2017

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed morinings (90%)
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
7	Are samples sent to the lab on a regular schedule in a timely fashion?	☑	
8	Are filters protected from contamination during handling and shipping? How?	☑	Clean gloves on and off
9	Are the site conditions reported regularly to the field operations manager or staff?	☐	

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

Provide any additional 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 BBE401 **Technician** Martin Valvur **Site Visit Date** 03/02/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6730b	CNU9335N72	none
DAS	Environmental Sys Corp	8816	4592	90767
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	0688001784	none
Flow Rate	Alicat	Unknown	Unknown	none
Infrastructure	Infrastructure	none	none	none
Mainframe	Climatronics	100081	1426	01847
Mainframe power supply	Climatronics	101074	unknown	none
Modem	US Robotics	56k	22SBB9FA71K4	none
Ozone	ThermoElectron Inc	49C	49C-58468-318	90517
Ozone Standard	ThermoElectron Inc	49C	0520012325	90831
Printer	Hewlett Packard	842C	unknown	none
Sample Tower	Aluma Tower	B	AT-5381-F9-1	none
Shelter Temperature	ARS	none	none	none
Shield (2 meter)	Climatronics	100325	1275	00390
Siting Criteria	Siting Criteria	1	None	None
Temperature Translator	Climatronics	100088-2	482	none
Temperature2meter	Climatronics	100093	missing	01049
Zero air pump	Werther International	PC70/4	606489	none

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CKT136-Sandy Grenville-03/14/2017						
1	3/14/2017	Computer	Dell	07050	Inspiron 15	Unknown
2	3/14/2017	DAS	Campbell	000354	CR3000	2132
3	3/14/2017	Elevation	Elevation	None	1	None
4	3/14/2017	Filter pack flow pump	Thomas	02361	107CA18	0290006116
5	3/14/2017	Flow Rate	Apex	000468	AXMC105LPMDPCV	illegible
6	3/14/2017	Infrastructure	Infrastructure	none	none	none
7	3/14/2017	Modem	Raven	06590	H4222-C	0844350343
8	3/14/2017	Ozone	ThermoElectron Inc	000744	49i A1NAA	1105347324
9	3/14/2017	Ozone Standard	ThermoElectron Inc	000200	49i A3NAA	0607315738
10	3/14/2017	Sample Tower	Aluma Tower	000822	B	none
11	3/14/2017	Shelter Temperature	Campbell	none	107-L	none
12	3/14/2017	Siting Criteria	Siting Criteria	None	1	None
13	3/14/2017	Temperature	RM Young	04689	41342VO	6703
14	3/14/2017	Zero air pump	Werther International	06902	PC70/4	000829157

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2132	CKT136	Sandy Grenville	03/14/2017	DAS	Primary

Das Date: 3 /14/2017
Das Time: 11:29:00
Das Day: 73

Audit Date 3 /14/2017
Audit Time 11:29:00
Audit Day 73

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	1/23/2017	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4996	0.4997	V	V	0.0001
7	0.7000	0.6995	0.6997	V	V	0.0002
7	0.9000	0.8994	0.8996	V	V	0.0002
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	CKT136	Sandy Grenville	03/14/2017	Flow Rate	000468

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.06
1.96%	1.96%			**Cal Factor Full Scale**	0.936
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.03	0.000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.000	-0.02	l/m	l/m	
primary	test pt 1	1.528	1.530	1.57	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 2	1.532	1.530	1.57	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.530	1.530	1.57	0.000	1.50	l/m	l/m	-1.96%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Fair	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.0 cm	**Status**	Fail
Sensor Component	Filter Azimuth	**Condition**	160 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	1105347324	CKT136	Sandy Grenville	03/14/2017	Ozone	000744

Slope:	0.99472	**Slope:**	0.00000
Intercept	0.52205	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00879	**Intercept**	0.36382
Cert Date	2/8/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.0%	2.1%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.22	-0.14	0.56	ppb	
primary	2	15.19	14.69	14.84	ppb	1.02%
primary	3	35.43	34.76	35.48	ppb	2.07%
primary	4	72.04	71.05	70.67	ppb	-0.53%
primary	5	110.01	108.69	108.90	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	-0.10	pass
Span	1.008	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	101.9 kHz	pass
Cell A Noise	1.2 ppb	pass
Cell A Flow	0.71 lpm	pass
Cell A Pressure	706.3 mmHg	pass
Cell A Tmp.	24.2 C	pass
Cell B Freq.	100.9 kHz	pass
Cell B Noise	1.8 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	6703	CKT136	Sandy Grenville	03/14/2017	Temperature	04689

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00759	**Intercept**	0.14754
Cert Date	2/4/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.11	0.22		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.16	0.01	0.000	0.1	C	0.06
primary	Temp Mid Range	25.53	25.19	0.000	25.2	C	0.04
primary	Temp High Range	48.56	48.05	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	CKT136	Sandy Grenville	03/14/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.18	0.33		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00759	Intercept	0.14754
Cert Date	2/4/2017	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	17.58	17.30	0.000	17.4	C	0.07
primary	Temp Mid Range	17.08	16.80	0.000	17.0	C	0.15
primary	Temp Mid Range	12.52	12.28	0.000	12.0	C	-0.33

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	CKT136	Technician	Sandy Grenville	Site Visit Date	03/14/2017

Shelter Make	Shelter Model	Shelter Size
Ekto	8810 (s/n 2116-2)	640 cuft

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

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is very clean and well organized. The shelter walls adjacent to the air conditioner and rear corner are rotting and buckled.

2 **Parameter:** MetOpMaintCom

The temperature sensor has been installed at approximately 8 meters from the ground on the sample tower in a naturally aspirated shield. The walls are beginning to show signs of rot.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	CKT136	**Technician**	Sandy Grenville	**Site Visit Date**	03/14/2017

Site Sponsor (agency)	EPA	**USGS Map**	Dingus
Operating Group	private	**Map Scale**	
AQS #	21-175-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	37.9211
Deposition Measurement	dry	**QAPP Longitude**	-83.0658
Land Use	woodland - mixed	**QAPP Elevation Meters**	455
Terrain	rolling	**QAPP Declination**	5.9
Conforms to MLM	Yes	**QAPP Declination Date**	2/22/2006
Site Telephone	(606) 522-3560	**Audit Latitude**	37.92146
Site Address 1	7687 Highway 437	**Audit Longitude**	-83.066295
Site Address 2		**Audit Elevation**	376
County	Morgan	**Audit Declination**	-6.1
City, State	West Liberty, KY		
Zip Code	41472	**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 2116-2)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is very clean and well organized. The shelter walls adjacent to the air conditioner and rear corner are rotting and buckled.				
Site OK	☑	**Notes**					

Driving Directions

From I-64 in Morehead go south on route 519 to West Liberty. At the first traffic light in West Liberty, turn left (east) onto route 460. Continue approximately 1 mile and turn left onto route 172. continue approximately 8 miles and then turn right onto route 437. Continue approximately 8 miles staying on 437. The road will climb a hill, turn left onto a dirt road at the top of the hill before the closed gas station). There is a sign for "KY Ridgerunners". The site is approximately 1/2 mile on the left.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/14/2017

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 CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/14/2017

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 CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/14/2017

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 temperature sensor has been installed at approximately 8 meters from the ground on the sample tower in a naturally aspirated shield. The walls are beginning to show signs of rot.

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	CKT136	Technician	Sandy Grenville	Site Visit Date	03/14/2017

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:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/14/2017

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	CKT136	Technician	Sandy Grenville	Site Visit Date	03/14/2017

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	☑	Nov 2001	☑
Field Ops Manual	☑	Oct 2001	☐
Calibration Reports	☑	Electronic copy	☑
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	CKT136	Technician	Sandy Grenville	Site Visit Date	03/14/2017

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?	☑	
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 and 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	CKT136	Technician	Sandy Grenville	Site Visit Date	03/14/2017

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed usually about noon
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 CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/14/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	Unknown	07050
DAS	Campbell	CR3000	2132	000354
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	0290006116	02361
Flow Rate	Apex	AXMC105LPMDPC	illegible	000468
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0844350343	06590
Ozone	ThermoElectron Inc	49i A1NAA	1105347324	000744
Ozone Standard	ThermoElectron Inc	49i A3NAA	0607315738	000200
Sample Tower	Aluma Tower	B	none	000822
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342VO	6703	04689
Zero air pump	Werther International	PC70/4	000829157	06902

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MCK131-Sandy Grenville-03/15/2017						
1	3/15/2017	Computer	Dell	07039	Inspiron 15	7M2MC12
2	3/15/2017	DAS	Campbell	000429	CR3000	2535
3	3/15/2017	Elevation	Elevation	None	1	None
4	3/15/2017	Filter pack flow pump	Thomas	00497	107CA18	118700000596
5	3/15/2017	Flow Rate	Apex	000528	AXMC105LPMDPCV	48097
6	3/15/2017	Infrastructure	Infrastructure	none	none	none
7	3/15/2017	Modem	Raven	06477	H4222-C	0808311292
8	3/15/2017	Ozone	ThermoElectron Inc	000723	49i A1NAA	1105347327
9	3/15/2017	Ozone Standard	ThermoElectron Inc	000366	49i A3NAA	0726124695
10	3/15/2017	Sample Tower	Aluma Tower	03514	A	none
11	3/15/2017	Shelter Temperature	Campbell	none	107-L	none
12	3/15/2017	Siting Criteria	Siting Criteria	None	1	None
13	3/15/2017	Temperature	RM Young	07002	41342	023293
14	3/15/2017	Zero air pump	Werther International	06912	PC70/4	000829177

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2535	MCK131	Sandy Grenville	03/15/2017	DAS	Primary

Das Date: 3 /15/2017
Das Time: 12:20:30
Das Day: 74

Audit Date 3 /15/2017
Audit Time 12:20:30
Audit Day 74

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0002	0.0002	0.0002	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	1/23/2017	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0002	0.0000	V	V	0.0002
7	0.1000	0.0997	0.0999	V	V	0.0002
7	0.3000	0.2996	0.2998	V	V	0.0002
7	0.5000	0.4995	0.4996	V	V	0.0001
7	0.7000	0.6994	0.6996	V	V	0.0002
7	0.9000	0.8992	0.8994	V	V	0.0002
7	1.0000	0.9991	0.9993	V	V	0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	48097	MCK131	Sandy Grenville	03/15/2017	Flow Rate	000528

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.005
1.95%	1.95%			**Cal Factor Full Scale**	0.983
				Rotometer Reading:	1.5

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	-0.01	0.000	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.00	0.000	0.00	l/m	l/m	
primary	test pt 1	1.542	1.540	1.53	0.000	1.51	l/m	l/m	-1.95%
primary	test pt 2	1.538	1.540	1.53	0.000	1.51	l/m	l/m	-1.95%
primary	test pt 3	1.539	1.540	1.54	0.000	1.51	l/m	l/m	-1.95%

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**	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	1105347327	MCK131	Sandy Grenville	03/15/2017	Ozone	000723

Slope:	1.00169	**Slope:**	0.00000
Intercept	-0.13324	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00879	**Intercept**	0.36382
Cert Date	2/8/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.7%	1.0%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	-0.35	-0.12	ppb	
primary	2	15.01	14.51	14.40	ppb	-0.76%
primary	3	35.04	34.37	34.03	ppb	-0.99%
primary	4	72.01	71.02	70.48	ppb	-0.76%
primary	5	110.04	108.72	109.20	ppb	0.44%

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.	91.6 kHz	pass
Cell A Noise	1.1 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	728.0 mmHg	pass
Cell A Tmp.	31.5 C	pass
Cell B Freq.	99.9 kHz	pass
Cell B Noise	0.8 ppb	pass
Cell B Flow	0.73 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	023293	MCK131	Sandy Grenville	03/15/2017	Temperature	07002

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00759	**Intercept**	0.14754
Cert Date	2/4/2017	**CorrCoff**	1.00000

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

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.38	0.23	0.000	0.4	C	0.16
primary	Temp Mid Range	25.85	25.51	0.000	25.5	C	-0.06
primary	Temp High Range	49.29	48.77	0.000	48.9	C	0.16

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	MCK131	Sandy Grenville	03/15/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.82	0.95		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00759	Intercept	0.14754
Cert Date	2/4/2017	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	20.50	20.20	0.000	19.6	C	-0.59
primary	Temp Mid Range	24.17	23.84	0.000	22.9	C	-0.95
primary	Temp Mid Range	24.68	24.35	0.000	23.4	C	-0.93

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	MCK131	Technician	Sandy Grenville	Site Visit Date	03/15/2017

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

1 **Parameter:** DocumentationCo

HASP and Field Operations Manual are not onsite.

2 **Parameter:** ShelterCleanNotes

The shelter is neat, clean, and well organized.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	MCK131	**Technician**	Sandy Grenville	**Site Visit Date**	03/15/2017

Site Sponsor (agency)	EPA	**USGS Map**	Mackville
Operating Group	Private	**Map Scale**	
AQS #	21-229-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	37.7044
Deposition Measurement	dry, wet	**QAPP Longitude**	-85.0483
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	353
Terrain	rolling	**QAPP Declination**	4.25
Conforms to MLM	Marginally	**QAPP Declination Date**	12/28/2004
Site Telephone	(859) 262-5181	**Audit Latitude**	37.704678
Site Address 1	Westley Miller Road	**Audit Longitude**	-85.048706
Site Address 2		**Audit Elevation**	293
County	Washington	**Audit Declination**	-4.5
City, State	Harrodsburg, KY		
Zip Code	40330	**Fire Extinguisher** ☑	New in 2015
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☐	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is neat, clean, and well organized.				
Site OK	☑	**Notes**					

Driving Directions From Danville go west on 150 toward Perryville. In Perryville turn right (north) on 1920 or Battlefield Road. Continue approximately 7.3 miles to Wesley Miller Road. Turn left onto Wesley Miller Road and continue approximately 1 mile. The site is on the left through a farm gate.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

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	MCK131	Technician	Sandy Grenville	Site Visit Date	03/15/2017

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?	☑	Temperature sensor facing 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:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

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	MCK131	Technician	Sandy Grenville	Site Visit Date	03/15/2017

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:

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

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 MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

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	☑	Electronic copy	☑
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:

HASP and Field Operations Manual are not onsite.

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

Site operation procedures

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

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	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 MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	7M2MC12	07039
DAS	Campbell	CR3000	2535	000429
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CA18	118700000596	00497
Flow Rate	Apex	AXMC105LPMDPC	48097	000528
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0808311292	06477
Ozone	ThermoElectron Inc	49i A1NAA	1105347327	000723
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124695	000366
Sample Tower	Aluma Tower	A	none	03514
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	023293	07002
Zero air pump	Werther International	PC70/4	000829177	06912

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MCK231-Sandy Grenville-03/15/2017						
1	3/15/2017	Computer	Dell	07058	Inspiron 15	3C3MC12
2	3/15/2017	DAS	Campbell	000359	CR3000	2137
3	3/15/2017	Elevation	Elevation	None	1	None
4	3/15/2017	Filter pack flow pump	Thomas	04513	107CAB18B	110000014171
5	3/15/2017	Flow Rate	Apex	000529	AXMC105LPMDPCV	illegible
6	3/15/2017	Infrastructure	Infrastructure	none	none	none
7	3/15/2017	Modem	Raven	06476	H4222-C	0808311140
8	3/15/2017	Ozone	ThermoElectron Inc	000682	49i A1NAA	1030244796
9	3/15/2017	Ozone Standard	ThermoElectron Inc	000369	49i A3NAA	0726124690
10	3/15/2017	Shelter Temperature	Campbell	none	107-L	none
11	3/15/2017	Siting Criteria	Siting Criteria	None	1	None
12	3/15/2017	Temperature	RM Young	07003	41342	025496
13	3/15/2017	Zero air pump	Werther International	06924	C 70/4	000836205

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2137	MCK231	Sandy Grenville	03/15/2017	DAS	Primary

Das Date: 3 /15/2017
Das Time: 12:08:34
Das Day: 74

Audit Date 3 /15/2017
Audit Time 12:08:34
Audit Day 74

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	1/23/2017	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0002	0.0000	V	V	0.0002
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2996	0.2998	V	V	0.0002
7	0.5000	0.4995	0.4996	V	V	0.0001
7	0.7000	0.6994	0.6995	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	illegible	MCK231	Sandy Grenville	03/15/2017	Flow Rate	000529

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.04
1.75%	1.96%			**Cal Factor Full Scale**	0.95
				Rotometer Reading:	1.45

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	PctDifference
primary	pump off	0.000	0.000	0.02	0.000	-0.03	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.000	0.02	l/m	l/m	
primary	test pt 1	1.534	1.530	1.55	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 2	1.528	1.530	1.55	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.526	1.520	1.55	0.000	1.50	l/m	l/m	-1.32%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	150 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	1030244796	MCK231	Sandy Grenville	03/15/2017	Ozone	000682

Slope:	0.99477	**Slope:**	0.00000
Intercept	0.33424	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00879	**Intercept**	0.36382
Cert Date	2/8/2017	**CorrCoff**	1.00000

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

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.01	-0.35	0.22	ppb	
primary	2	15.02	14.52	14.73	ppb	1.45%
primary	3	35.02	34.35	34.48	ppb	0.38%
primary	4	72.01	71.02	70.47	ppb	-0.77%
primary	5	109.50	108.18	108.30	ppb	0.11%

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.	102.9 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.85 lpm	pass
Cell A Pressure	718.5 mmHg	pass
Cell A Tmp.	30.9 C	pass
Cell B Freq.	92.8 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.70 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	025496	MCK231	Sandy Grenville	03/15/2017	Temperature	07003

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00759	**Intercept**	0.14754
Cert Date	2/4/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.14	0.21		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.38	0.23	0.000	0.4	C	0.15
primary	Temp Mid Range	25.85	25.51	0.000	25.3	C	-0.21
primary	Temp High Range	47.80	47.29	0.000	47.4	C	0.06

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	MCK231	Sandy Grenville	03/15/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.81	0.94		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00759	Intercept	0.14754
Cert Date	2/4/2017	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	22.90	22.58	0.000	23.2	C	0.57
primary	Temp Mid Range	24.17	23.84	0.000	22.9	C	-0.94
primary	Temp Mid Range	24.53	24.20	0.000	23.3	C	-0.92

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	MCK231	Technician	Sandy Grenville	Site Visit Date	03/15/2017

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

1 **Parameter:** ShelterCleanNotes

The site instruments are located in the MCK131 shelter. The same site operator is servicing both sites.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	MCK231	**Technician**	Sandy Grenville	**Site Visit Date**	03/15/2017

Site Sponsor (agency)	EPA	**USGS Map**	Mackville
Operating Group	Private	**Map Scale**	
AQS #	21-229-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	37.7044
Deposition Measurement	dry, wet	**QAPP Longitude**	-85.0483
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	353
Terrain	rolling	**QAPP Declination**	4.25
Conforms to MLM	Marginally	**QAPP Declination Date**	12/28/2004
Site Telephone	(859) 262-5181	**Audit Latitude**	37.704678
Site Address 1	Wesley Miller Road	**Audit Longitude**	-85.048706
Site Address 2		**Audit Elevation**	293
County	Washington	**Audit Declination**	-4.5
City, State	Harrodsburg, KY		**Present**
Zip Code	40330	**Fire Extinguisher**	☑ New in 2015
Time Zone	Eastern	**First Aid Kit**	☑
Primary Operator		**Safety Glasses**	☑
Primary Op. Phone #		**Safety Hard Hat**	☑
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☐
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The site instruments are located in the MCK131 shelter. The same site operator is servicing both sites.				
Site OK	☑	**Notes**					

Driving Directions From Danville go west on 150 toward Perryville. In Perryville turn right (north) on 1920 or Battlefield Road. Continue approximately 7.3 miles to Wesley Miller Road. Turn left onto Wesley Miller Road and continue approximately 1 mile. The site is on the left through a farm gate.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

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	MCK231	Technician	Sandy Grenville	Site Visit Date	03/15/2017

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?	☐	Temperature facing south
5	Are temperature and RH sensors sited to avoid unnatural conditions? (i.e. ground below sensors should be natural surface and not steeply sloped. Ridges, hollows, and areas of standing water should be avoided)	☑	
6	Is the solar radiation sensor plumb?	☑	N/A
7	Is it sited to avoid shading, or any artificial or reflected light?	☑	N/A
8	Is the rain gauge plumb?	☑	N/A
9	Is it sited to avoid sheltering effects from buildings, trees, towers, etc?	☑	N/A
10	Is the surface wetness sensor sited with the grid surface facing north?	☑	N/A
11	Is it inclined approximately 30 degrees?	☑	N/A

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

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

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	MCK231	Technician	Sandy Grenville	Site Visit Date	03/15/2017

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 13 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 MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

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	MCK231	Technician	Sandy Grenville	Site Visit Date	03/15/2017

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	☑	Oct 2014	☑
Calibration Reports	☑	Electronic copy	☑
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 MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained on-site by MACTEC technician
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?	☑	
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 MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

Site operation procedures

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

QC Check Performed		Frequency	Compliant
Multi-point MFC Calibrations	☑	Semiannually	☑
Flow System Leak Checks	☑	Weekly	☑
Filter Pack Inspection	☐		☐
Flow Rate Setting Checks	☑	Weekly	☑
Visual Check of Flow Rate Rotometer	☑	Weekly	☑
In-line Filter Inspection/Replacement	☑	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 MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/15/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	3C3MC12	07058
DAS	Campbell	CR3000	2137	000359
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18B	110000014171	04513
Flow Rate	Apex	AXMC105LPMDPC	illegible	000529
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4222-C	0808311140	06476
Ozone	ThermoElectron Inc	49i A1NAA	1030244796	000682
Ozone Standard	ThermoElectron Inc	49i A3NAA	0726124690	000369
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	025496	07003
Zero air pump	Werther International	C 70/4	000836205	06924

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
EVE419-Eric Hebert-03/15/2017						
1	3/15/2017	DAS	Environmental Sys Corp	90642	8816	2527
2	3/15/2017	Elevation	Elevation	None	1	None
3	3/15/2017	Filter pack flow pump	Cole Palmer	90909	L-79200-30	059400000413
4	3/15/2017	flow rate	Tylan	none	FC280SAV	AW9706013
5	3/15/2017	Infrastructure	Infrastructure	none	none	none
6	3/15/2017	MFC power supply	Tylan	none	RO-32	FP9706003
7	3/15/2017	Modem	US Robotics	none	56k	unknown
8	3/15/2017	Sample Tower	Aluma Tower	none	B	AT-71102-71-2
9	3/15/2017	Siting Criteria	Siting Criteria	None	1	None

DAS Data Form

DAS Time Max Error: 2.5

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2527	EVE419	Eric Hebert	03/15/2017	DAS	Primary

Das Date: 3 /15/2017
Das Time: 12:04:30
Das Day: 74

Audit Date 3 /15/2017
Audit Time 12:07:00
Audit Day 74

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	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	2/23/2017	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.1000	0.1000	V	V	0.0000
7	0.3000	0.3000	0.3000	V	V	0.0000
7	0.5000	0.5000	0.5000	V	V	0.0000
7	0.7000	0.6999	0.6998	V	V	-0.0001
7	0.9000	0.8999	0.8998	V	V	-0.0001
7	1.0000	0.9999	0.9997	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW9706013	EVE419	Eric Hebert	03/15/2017	flow rate	none

Mfg	Tylan	
SN/Owner ID	FP9706003	none
Parameter	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	122974	**Tfer Desc.**	BIOS 220-H
Tfer ID	01416		
Slope	1.00732	**Intercept**	-0.02202
Cert Date	3/8/2017	**CorrCoff**	0.99970

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
0.56%	0.67%			

Cal Factor Zero	-0.002
Cal Factor Full Scale	5.007
Rotometer Reading:	2.95

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	0.0000	0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.0000	0.05	l/m	l/m	
primary	test pt 1	3.003	3.000	3.01	0.0000	3.02	l/m	l/m	0.67%
primary	test pt 2	3.003	3.000	3.01	0.0000	3.02	l/m	l/m	0.67%
primary	test pt 3	3.010	3.010	3.01	0.0000	3.02	l/m	l/m	0.33%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	See comments	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-0.5 cm	**Status**	Fail
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Infrastructure Data For

Site ID	Technician	Site Visit Date
EVE419	Eric Hebert	03/15/2017

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	Fair	Status	pass
Sensor Component	Moisture Trap	Condition	Not installed	Status	pass
Sensor Component	Power Cables	Condition	Fair	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Fair	Status	pass
Sensor Component	Shelter Door	Condition	Good	Status	pass
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Shelter Floor	Condition	Poor	Status	Fail
Sensor Component	Signal Cable	Condition	Fair	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Sample Train	Condition	Good	Status	pass

Site Visit Comments

Parameter	Site	Technician	S.V. Date	Component	Mfg	Serial No.	Hazard	Problem
Flow Rate	EVE419	Eric Hebert	03/15/2017	Moisture Present	Tylan	815	☐	☐

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Assistance was provided to the site operators regarding questions relating to the SSRF. The rational and importance of properly recording the vegetation observations was discussed.

2 **Parameter:** DasComments

A winch has been added to assist with lowering the sample tower.

3 **Parameter:** SitingCriteriaCom

Small parking lot for park employees and fire fighting equipment is within 100 meters of the site.

4 **Parameter:** ShelterCleanNotes

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

5 **Parameter:** MetSensorComme

The 10 meter temperature sensor has been removed and temperature is now being measured using a combination RH/temperature sensor mounted in a naturally aspirated shield at approximately 2 meters above the ground. The temperature measurement system was not challenged with an audit standard.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	EVE419	**Technician**	Eric Hebert	**Site Visit Date**	03/15/2017

Site Sponsor (agency)	NPS/EPA	**USGS Map**	Long Pine Key
Operating Group	NPS	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer		**QAPP Latitude**	
Deposition Measurement	dry, wet, Hg, IMPROVE	**QAPP Longitude**	
Land Use	wetlands	**QAPP Elevation Meters**	
Terrain	flat	**QAPP Declination**	
Conforms to MLM	Yes	**QAPP Declination Date**	
Site Telephone	(305) 242-7838	**Audit Latitude**	25.391223
Site Address 1	Everglades National Park	**Audit Longitude**	-80.680819
Site Address 2	40001 State Road 9336	**Audit Elevation**	1
County	Dade	**Audit Declination**	-5.1
City, State	Homestead, FL		
Zip Code	33034	**Fire Extinguisher**	☐
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 very clean, neat and well organized. The shelter floor is in poor condition.				
Site OK	☑	**Notes**					

Driving Directions

Take the Florida Turnpike (Rat 821) south to the end and junction with Rat 1. Continue south on Rat 1 about 1/4 mile to the intersection of East Palm Drive (Rat 9336). Turn right (west) on 9336 and continue to the park entrance. Check-in at the guard station. Take the Main Park Road to Long Pine Key Road. Turn left on Long Pine Key Rd. and continue to the research facility. The site is on the right at the fire station.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID EVE419 **Technician** Eric Hebert **Site Visit Date** 03/15/2017

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

Siting Distances OK ☑

Siting Criteria Comment

Small parking lot for park employees and fire fighting equipment is within 100 meters of the site.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	EVE419	Technician	Eric Hebert	Site Visit Date	03/15/2017

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

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

The 10 meter temperature sensor has been removed and temperature is now being measured using a combination RH/temperature sensor mounted in a naturally aspirated shield at approximately 2 meters above the ground. The temperature measurement system was not challenged with an audit standard.

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID EVE419 **Technician** Eric Hebert **Site Visit Date** 03/15/2017

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

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

Field Systems Data Form

F-02058-1500-S5-rev002

Site ID	EVE419	Technician	Eric Hebert	Site Visit Date	03/15/2017

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		N/A
4	Describe dry dep sample tube.		3/8 teflon by 9 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☐	N/A
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☐	N/A
8	Are there moisture traps in the sample lines?	☐	No moisture trap installed
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 EVE419 **Technician** Eric Hebert **Site Visit Date** 03/15/2017

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:

A winch has been added to assist with lowering the sample tower.

Field Systems Data Form

F-02058-1500-S7-rev002

Site ID	EVE419	Technician	Eric Hebert	Site Visit Date	03/15/2017

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	☐	N/A	☐
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?	☑	
3	Are the chain-of-custody forms properly used to document sample transfer to and from lab?	☑	
4	Are ozone z/s/p control charts properly completed and current?	☐	N/A

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

Field Systems Data Form

F-02058-1500-S8-rev002

Site ID EVE419 **Technician** Eric Hebert **Site Visit Date** 03/15/2017

Site operation procedures

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

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID EVE419 **Technician** Eric Hebert **Site Visit Date** 03/15/2017

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 to handle filter
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	☐		☐
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:

Assistance was provided to the site operators regarding questions relating to the SSRF. The rational and importance of properly recording the vegetation observations was discussed.

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

Site ID EVE419 **Technician** Eric Hebert **Site Visit Date** 03/15/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8816	2527	90642
Elevation	Elevation	1	None	None
Filter pack flow pump	Cole Palmer	L-79200-30	059400000413	90909
flow rate	Tylan	FC280SAV	AW9706013	none
Infrastructure	Infrastructure	none	none	none
MFC power supply	Tylan	RO-32	FP9706003	none
Modem	US Robotics	56k	unknown	none
Sample Tower	Aluma Tower	B	AT-71102-71-2	none
Siting Criteria	Siting Criteria	1	None	None

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ALC188-Sandy Grenville-03/28/2017						
1	3/28/2017	Computer	Dell	07006	Inspiron 15	373MC12
2	3/28/2017	DAS	Campbell	000422	CR3000	2523
3	3/28/2017	Elevation	Elevation	None	1	None
4	3/28/2017	Filter pack flow pump	Thomas	02976	107CAB18	0493002475
5	3/28/2017	Flow Rate	Apex	000683	AXMC105LPMDPCV	illegible
6	3/28/2017	Infrastructure	Infrastructure	none	none	none
7	3/28/2017	Modem	Raven	06583	H4223-C	08443555843
8	3/28/2017	Ozone	ThermoElectron Inc	000745	49i A1NAA	1105347310
9	3/28/2017	Ozone Standard	ThermoElectron Inc	000694	49i A3NAA	1030244815
10	3/28/2017	Sample Tower	Aluma Tower	000136	B	none
11	3/28/2017	Shelter Temperature	Campbell	none	107-L	none
12	3/28/2017	Siting Criteria	Siting Criteria	None	1	None
13	3/28/2017	Temperature	RM Young	06559	41342	illegible
14	3/28/2017	Zero air pump	Werther International	06940	C 70/4	000821897

DAS Data Form

DAS Time Max Error: 0

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2523	ALC188	Sandy Grenville	03/28/2017	DAS	Primary

Das Date: 3 /28/2017
Das Time: 9:43:10
Das Day: 87

Audit Date 3 /28/2017
Audit Time 9:43:10
Audit Day 87

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	1/23/2017	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0000	V	V	0.0000
7	0.1000	0.0999	0.0999	V	V	0.0000
7	0.3000	0.2997	0.2997	V	V	0.0000
7	0.5000	0.4997	0.4995	V	V	-0.0002
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	ALC188	Sandy Grenville	03/28/2017	Flow Rate	000683

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.99825	**Intercept**	0.00497
Cert Date	2/7/2017	**CorrCoff**	0.99991

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.007
1.96%	1.96%			**Cal Factor Full Scale**	0.972
				Rotometer Reading:	1.45

Desc.	Test type	Input l/m	Input Corr_	MfcDisp.	OutputSignal	Output S E	InputUnit	OutputSignall	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	1.532	1.530	1.55	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 2	1.533	1.530	1.55	0.000	1.50	l/m	l/m	-1.96%
primary	test pt 3	1.534	1.530	1.55	0.000	1.50	l/m	l/m	-1.96%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.5 cm	**Status**	pass
Sensor Component	Filter Depth	**Condition**	4.0 cm	**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	225 deg	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347310	ALC188	Sandy Grenville	03/28/2017	Ozone	000745

Slope:	0.98751	**Slope:**	0.00000
Intercept	-0.38549	**Intercept**	0.00000
CorrCoff	0.99987	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00250	**Intercept**	0.45870
Cert Date	3/21/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.4%	5.7%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.04	-0.41	0.07	ppb	
primary	2	15.05	14.55	13.72	ppb	-5.70%
primary	3	35.05	34.50	33.05	ppb	-4.20%
primary	4	72.00	71.36	69.50	ppb	-2.61%
primary	5	109.97	109.23	108.10	ppb	-1.03%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.00	pass
Span	0.996	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	97.5 kHz	pass
Cell A Noise	0.9 ppb	pass
Cell A Flow	0.72 lpm	pass
Cell A Pressure	742.9 mmHg	pass
Cell A Tmp.	31.8 C	pass
Cell B Freq.	100.8 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.73 lpm	pass
Cell B Pressure	Not tested	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	illegible	ALC188	Sandy Grenville	03/28/2017	Temperature	06559

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00759	**Intercept**	0.14754
Cert Date	2/4/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.09	0.19		

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Low Range	0.44	0.29	0.000	0.5	C	0.19
primary	Temp Mid Range	25.34	25.00	0.000	25.0	C	0.02
primary	Temp High Range	49.71	49.19	0.000	49.1	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	ALC188	Sandy Grenville	03/28/2017	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.84	0.87		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00759	Intercept	0.14754
Cert Date	2/4/2017	CorrCoff	1.00000

UseDesc.	Test type	InputTmpRaw	InputTmpCorr.	OutputTmpSignal	OutputSignalEng	OSE Unit	Difference
primary	Temp Mid Range	26.81	26.46	0.000	25.6	C	-0.84
primary	Temp Mid Range	26.46	26.11	0.000	25.3	C	-0.8
primary	Temp Mid Range	25.62	25.28	0.000	24.4	C	-0.87

Sensor Component	System Memo	Condition		Status	pass

Infrastructure Data For

Site ID	ALC188	Technician	Sandy Grenville	Site Visit Date	03/28/2017

Shelter Make	Shelter Model	Shelter Size
Shelter One	8128-2311	1024 cuft

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

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is well located with respect to CASTNET siting criteria, however there is a small campground 0.5 km to the northwest which may be a source of smoke.

2 **Parameter:** ShelterCleanNotes

The site is clean and neat.

Field Systems Data Form

F-02058-1500-S1-rev002

Site ID	ALC188	**Technician**	Sandy Grenville	**Site Visit Date**	03/28/2017

Site Sponsor (agency)	EPA	**USGS Map**	Dallardsville
Operating Group	Alabama-Coushatta Environmental Gr	**Map Scale**	
AQS #	48-373-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	30.4210
Deposition Measurement	dry	**QAPP Longitude**	-94.4045
Land Use	woodland - mixed	**QAPP Elevation Meters**	101
Terrain	gently rolling	**QAPP Declination**	3.8
Conforms to MLM	Yes	**QAPP Declination Date**	9/16/2005
Site Telephone	(936) 563-2973	**Audit Latitude**	30.701577
Site Address 1	Poncho Rd.	**Audit Longitude**	-94.674011
Site Address 2	571 Park Rd. 56	**Audit Elevation**	105
County	Polk	**Audit Declination**	2.5
City, State	Livingston, TX		
Zip Code	77351		
Time Zone	Central		
Primary Operator			
Primary Op. Phone #			
Primary Op. E-mail			
Backup Operator			
Backup Op. Phone #			
Backup Op. E-mail			

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

Shelter Working Room	☑	**Make**	Shelter One	**Model**	8128-2311	**Shelter Size**	1024 cuft
Shelter Clean	☑	**Notes**	The site is clean and neat.				
Site OK	☑	**Notes**					

Driving Directions

From Livingston proceed east on route 190 approximately 16 miles. Turn right (south) onto Park Road 56 at the sign for Alabama-Coushatta Tribe and the Indain Village. Continue past the facility and campground by the small lake on the left. Just past the campground entrance, turn left onto a dirt road. Continue approximately 0.6 miles bearing right at the first fork and left at the second. You will see the site in the clearing.

Field Systems Data Form

F-02058-1500-S2-rev002

Site ID ALC188 **Technician** Sandy Grenville **Site Visit Date** 03/28/2017

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

Siting Distances OK ☑

Siting Criteria Comment

The site is well located with respect to CASTNET siting criteria, however there is a small campground 0.5 km to the northwest which may be a source of smoke.

Field Systems Data Form

F-02058-1500-S3-rev002

Site ID	ALC188	Technician	Sandy Grenville	Site Visit Date	03/28/2017

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?	☐	Temperature sensor facing 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:

Field Systems Data Form

F-02058-1500-S4-rev002

Site ID	ALC188	Technician	Sandy Grenville	Site Visit Date	03/28/2017

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	ALC188	Technician	Sandy Grenville	Site Visit Date	03/28/2017

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
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☑	
8	Are there moisture traps in the sample lines?	☑	
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

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

Field Systems Data Form

F-02058-1500-S6-rev002

Site ID ALC188 **Technician** Sandy Grenville **Site Visit Date** 03/28/2017

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	ALC188	Technician	Sandy Grenville	Site Visit Date	03/28/2017

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 2011	☑
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?	☑	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	ALC188	Technician	Sandy Grenville	Site Visit Date	03/28/2017

Site operation procedures

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

Field Systems Data Form

F-02058-1500-S9-rev002

Site ID ALC188 **Technician** Sandy Grenville **Site Visit Date** 03/28/2017

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 ALC188 **Technician** Sandy Grenville **Site Visit Date** 03/28/2017

Site Visit Sensors

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	Inspiron 15	373MC12	07006
DAS	Campbell	CR3000	2523	000422
Elevation	Elevation	1	None	None
Filter pack flow pump	Thomas	107CAB18	0493002475	02976
Flow Rate	Apex	AXMC105LPMDPC	illegible	000683
Infrastructure	Infrastructure	none	none	none
Modem	Raven	H4223-C	08443555843	06583
Ozone	ThermoElectron Inc	49i A1NAA	1105347310	000745
Ozone Standard	ThermoElectron Inc	49i A3NAA	1030244815	000694
Sample Tower	Aluma Tower	B	none	000136
Shelter Temperature	Campbell	107-L	none	none
Siting Criteria	Siting Criteria	1	None	None
Temperature	RM Young	41342	illegible	06559
Zero air pump	Werther International	C 70/4	000821897	06940

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 4/18/2017 7:21:58 PM

SiteVisitDate	Site	Technician
03/28/2017	ALC188	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	0.19	c	**P**
3	Ozone Slope	P	0	1.1	4	0.98751	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.38549	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99987	unitless	**P**
6	Ozone % difference avg	P	7	10	4	3.4	%	**P**
7	Ozone % difference max	P	7	10	4	5.7	%	**P**
8	Flow Rate average % difference	P	10	5	2	1.96	%	**P**
9	Flow Rate max % difference	P	10	5	2	1.96	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	56	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	9	0.84	c	**P**
13	Shelter Temperature max error	P	5	2	9	0.87	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	56			
2	Shelter Temperature standard deviation		5	0	9			
3	Temperature standard deviation		4	0	6			

SiteVisitDate	Site	Technician
03/28/2017	ALC188	Sandy Grenville

Field Systems Comments

1 **Parameter:** SitingCriteriaCom

The site is well located with respect to CASTNET siting criteria, however there is a small campground 0.5 km to the northwest which may be a source of smoke.

2 **Parameter:** ShelterCleanNotes

The site is clean and neat.

EEMS Spot Report

Data Compiled: 4/18/2017 5:05:36 PM

SiteVisitDate	Site	Technician
03/02/2017	BBE401	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.05	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.07	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00088	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.58293	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.7	%	**P**
7	Ozone % difference max	P	7	10	4	3.8	%	**P**
8	Flow Rate average % difference	P	10	5	2	1.06	%	**P**
9	Flow Rate max % difference	P	10	5	2	1.22	%	**P**
10	DAS Time maximum error	P	0	5	1	1.27	min	**P**
11	DAS Voltage average error	P	15	0.003	14	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	12	0.36	c	**P**
13	Shelter Temperature max error	P	5	2	12	0.95	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		15	0	14			
2	Shelter Temperature standard deviation		5	0	12			
3	Temperature2meter Standard Deviation		5	0	3			

SiteVisitDate	Site	Technician
03/02/2017	BBE401	Martin Valvur

Field Performance Comments

1 **Parameter:** Temperature2mete **SensorComponent:** System Memo **CommentCode:** 4

The sensor signal cables are showing signs of wear.

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone sample line is leak tested once each month when the inlet filter is replaced.

2 **Parameter:** ShelterCleanNotes

The shelter is clean, neat, and well organized.

3 **Parameter:** MetSensorComme

The two meter temperature sensor is mounted at 1.6 meters above the ground.

4 **Parameter:** MetOpMaintCom

The signal cables are in poor condition. Photos of the two meter temperature sensor signal cable can be found on the EEMS server.

EEMS Spot Report

Data Compiled: 4/18/2017 5:34:17 PM

SiteVisitDate	Site	Technician
03/14/2017	CKT136	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	0.11	c	**P**
2	Temperature max error	P	4	0.5	9	0.22	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99472	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.52205	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.0	%	**P**
7	Ozone % difference max	P	7	10	4	2.1	%	**P**
8	Flow Rate average % difference	P	10	5	4	1.96	%	**P**
9	Flow Rate max % difference	P	10	5	4	1.96	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	42	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	15	0.18	c	**P**
13	Shelter Temperature max error	P	5	2	15	0.33	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	42			
2	Shelter Temperature standard deviation		5	0	15			
3	Temperature standard deviation		4	0	9			

SiteVisitDate	Site	Technician
03/14/2017	CKT136	Sandy Grenville

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is very clean and well organized. The shelter walls adjacent to the air conditioner and rear corner are rotting and buckled.

2 **Parameter:** MetOpMaintCom

The temperature sensor has been installed at approximately 8 meters from the ground on the sample tower in a naturally aspirated shield. The walls are beginning to show signs of rot.

EEMS Spot Report

Data Compiled: 4/17/2017 3:48:39 PM

SiteVisitDate	Site	Technician
03/23/2017	COW137	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	0.99635	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.41148	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.0	%	**P**
5	Ozone % difference max	P	7	10	4	2.2	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 4/18/2017 3:08:53 PM

SiteVisitDate	Site	Technician
02/21/2017	CVL151	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.02	c	**P**
2	Temperature max error	P	4	0.5	3	0.04	c	**P**
3	Ozone Slope	P	0	1.1	4	1.0025	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.49278	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.1	%	**P**
7	Ozone % difference max	P	7	10	4	2.6	%	**P**
8	Flow Rate average % difference	P	10	5	4	1.75	%	**P**
9	Flow Rate max % difference	P	10	5	4	1.96	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	56	0.0000	V	**P**
12	Shelter Temperature average error	P	5	2	9	0.36	c	**P**
13	Shelter Temperature max error	P	5	2	9	0.41	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	56			
2	Shelter Temperature standard deviation		5	0	9			
3	Temperature standard deviation		4	0	3			

SiteVisitDate	Site	Technician
02/21/2017	CVL151	Sandy Grenville

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** DasComments

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

2 **Parameter:** SitingCriteriaCom

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

3 **Parameter:** ShelterCleanNotes

The shelter is somewhat cluttered. The shelter roof is still leaking and the walls are rotten at the seams and corners. The shelter is in poor condition.

EEMS Spot Report

Data Compiled: 4/6/2017 8:03:47 PM

SiteVisitDate	Site	Technician
03/16/2017	ESP127	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	1.00432	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.47637	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.5	%	**P**
5	Ozone % difference max	P	7	10	4	2.9	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 4/19/2017 12:45:50 PM

SiteVisitDate	Site	Technician
03/15/2017	EVE419	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Flow Rate average % difference	P	10	5	6	0.56	%	**P**
2	Flow Rate max % difference	P	10	5	6	0.67	%	**P**
3	DAS Time maximum error	P	0	5	1	2.5	min	**P**
4	DAS Voltage average error	P	7	0.003	35	0.0001	V	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	35			

SiteVisitDate	Site	Technician
03/15/2017	EVE419	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:** SiteOpsProcComm

Assistance was provided to the site operators regarding questions relating to the SSRF. The rational and importance of properly recording the vegetation observations was discussed.

2 **Parameter:** DasComments

A winch has been added to assist with lowering the sample tower.

3 **Parameter:** SitingCriteriaCom

Small parking lot for park employees and fire fighting equipment is within 100 meters of the site.

4 **Parameter:** ShelterCleanNotes

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

5 **Parameter:** MetSensorComme

The 10 meter temperature sensor has been removed and temperature is now being measured using a combination RH/temperature sensor mounted in a naturally aspirated shield at approximately 2 meters above the ground. The temperature measurement system was not challenged with an audit standard.

EEMS Spot Report

Data Compiled: 4/6/2017 7:37:13 PM

SiteVisitDate	Site	Technician
02/27/2017	GAS153	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	0.99653	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.67934	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.2	%	**P**
5	Ozone % difference max	P	7	10	4	3.1	%	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Time maximum error		0	0	1			

EEMS Spot Report

Data Compiled: 4/6/2017 8:31:04 PM

SiteVisitDate	Site	Technician
03/17/2017	IRL141	Eric Hebert

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98534	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.72332	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	3.6	%	**P**
5	Ozone % difference max	P	7	10	4	6.1	%	**P**

Records without valid pass/fail criteria

EEMS Spot Report

Data Compiled: 4/18/2017 6:16:08 PM

SiteVisitDate	Site	Technician
03/15/2017	MCK131	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.13	c	**P**
2	Temperature max error	P	4	0.5	3	0.16	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00169	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.13324	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99996	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.7	%	**P**
7	Ozone % difference max	P	7	10	4	1.0	%	**P**
8	Flow Rate average % difference	P	10	5	6	1.95	%	**P**
9	Flow Rate max % difference	P	10	5	6	1.95	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	35	0.0002	V	**P**
12	Shelter Temperature average error	P	5	2	9	0.82	c	**P**
13	Shelter Temperature max error	P	5	2	9	0.95	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	35			
2	Shelter Temperature standard deviation		5	0	9			
3	Temperature standard deviation		4	0	3			

SiteVisitDate	Site	Technician
03/15/2017	MCK131	Sandy Grenville

Field Systems Comments

1 **Parameter:** DocumentationCo

HASP and Field Operations Manual are not onsite.

2 **Parameter:** ShelterCleanNotes

The shelter is neat, clean, and well organized.

EEMS Spot Report

Data Compiled: 4/18/2017 5:55:38 PM

SiteVisitDate	Site	Technician
03/15/2017	MCK231	Sandy Grenville

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.14	c	**P**
2	Temperature max error	P	4	0.5	3	0.21	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99477	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.33424	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.7	%	**P**
7	Ozone % difference max	P	7	10	4	1.4	%	**P**
8	Flow Rate average % difference	P	10	5	3	1.75	%	**P**
9	Flow Rate max % difference	P	10	5	3	1.96	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	63	0.0001	V	**P**
12	Shelter Temperature average error	P	5	2	9	0.81	c	**P**
13	Shelter Temperature max error	P	5	2	9	0.94	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Voltage maximum error		7	0	63			
2	Shelter Temperature standard deviation		5	0	9			
3	Temperature standard deviation		4	0	3			

SiteVisitDate	Site	Technician
03/15/2017	MCK231	Sandy Grenville

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The site instruments are located in the MCK131 shelter. The same site operator is servicing both sites.

EEMS Spot Report

Data Compiled: 4/18/2017 4:29:29 PM

SiteVisitDate	Site	Technician
02/27/2017	PAL190	Martin Valvur

Records with valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature2meter average error	P	5	0.5	3	0.05	c	**P**
2	Temperature2meter max error	P	5	0.5	3	0.06	c	**P**
3	Wind Speed average error below 5m/s in m/s	P	3	0.5	8	0.02	m/s	**P**
4	Wind Speed max error below 5m/s in m/s	P	3	0.5	8	0.10	m/s	**P**
5	Wind Speed average % difference above 5 m/s	P	3	5	8	0.0	%	**P**
6	Wind Speed max % difference above 5 m/s	P	3	5	8	0.0	%	**P**
7	Wind Speed Torque average error	P	3	0.5	1	0.20	g-cm	**P**
8	Wind Speed Torque max error	P	3	0.5	1	0.2	g-cm	**P**
9	Wind Direction Input Deg True average error (de	P	2	5	8	2.0	degrees	**P**
10	Wind Direction Input Deg True max error (deg)	P	2	5	8	4	degrees	**P**
11	Wind Direction Linearity average error (deg)	P	2	5	16	1.5	degrees	**P**
12	Wind Direction Linearity max error (deg)	P	2	5	16	3	degrees	**P**
13	Wind Direction Torque average error	P	2	30	1	16	g-cm	**P**
14	Wind Direction Torque max error	P	2	30	1	17	g-cm	**P**
15	Temperature average error	P	4	0.5	15	0.04	c	**P**
16	Temperature max error	P	4	0.5	15	0.08	c	**P**
17	Relative Humidity average above 85%	P	6	10	2	6.4	%	**P**
18	Relative Humidity max above 85%	P	6	10	2	6.4	%	**P**
19	Relative Humidity average below 85%	P	6	10	6	2.5	%	**P**
20	Relative Humidity max below 85%	P	6	10	6	3.2	%	**P**
21	Solar Radiation % diff of avg	P	9	10	12	16.63	%	**Fail**
22	Solar Radiation % diff of max STD value	P	9	10	12	17.2	%	**Fail**
23	Precipitation average % difference	P	1	10	1	2.0	%	**P**
24	Precipitation max % difference	P	1	10	1	2.0	%	**P**
25	Ozone Slope	P	0	1.1	4	0.99023	unitless	**P**
26	Ozone Intercept	P	0	5	4	-0.05742	ppb	**P**
27	Ozone correlation	P	0	0.995	4	0.99989	unitless	**P**
28	Ozone % difference avg	P	7	10	4	1.5	%	**P**
29	Ozone % difference max	P	7	10	4	3.8	%	**P**
30	Flow Rate average % difference	P	10	5	4	0.98	%	**P**
31	Flow Rate max % difference	P	10	5	4	1.31	%	**P**
32	DAS Time maximum error	P	0	5	1	0.00	min	**P**
33	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**

SiteVisitDate	Site	Technician
02/27/2017	PAL190	Martin Valvur

34	Surface Wetness Response	P	12	0.5	1	1.01		**P**
35	Shelter Temperature average error	P	5	2	15	0.28	c	**P**
36	Shelter Temperature max error	P	5	2	15	0.35	c	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Surface Wetness Manual Test Pass Fail		12	0	1			
2	DAS Voltage maximum error		7	0	49			
3	Shelter Temperature standard deviation		5	0	15			
4	Temperature standard deviation		4	0	15			
5	Temperature2meter Standard Deviation		5	0	3			
6	Precipitation total of % diff		1	0	1			
7	Precipitation total of abs diff mm or in		1	0	1			
8	Precipitation total of DAS mm or in		1	0	1			
9	Precipitation total of equivalent mm or in		1	0	1			

SiteVisitDate	Site	Technician
02/27/2017	PAL190	Martin Valvur

Field Performance Comments

1 **Parameter:** Ozone **SensorComponent:** Cell A Flow **CommentCode:** 99

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

2 **Parameter:** Temperature **SensorComponent:** System Memo **CommentCode:** 4

The sensor signal cables are showing signs of wear.

3 **Parameter:** Temperature2mete **SensorComponent:** System Memo **CommentCode:** 4

The sensor signal cables are showing signs of wear.

4 **Parameter:** Temperature2mete **SensorComponent:** Blower **CommentCode:** 26

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

Field Systems Comments

1 **Parameter:** DasComments

The lower temperature sensor is mounted at 1.75 meters above the ground.

2 **Parameter:** SiteOpsProcedures

The ozone sample train is leak tested every two weeks.

3 **Parameter:** SitingCriteriaCom

The site is located 40 km southeast of Amarillo TX which has a population of approximately 178,000.

4 **Parameter:** ShelterCleanNotes

The shelter is in good condition.

5 **Parameter:** MetSensorComme

The surface wetness sensor grid is inclined approximately 45 degrees and is oriented to the northwest.

6 **Parameter:** MetOpMaintCom

The sensor signal cables are in very poor condition. The outer shield is broken and missing in several places. The two meter temperature sensor blower is not functioning.

EEMS Spot Report

Data Compiled: 4/6/2017 7:43:08 PM

SiteVisitDate	Site	Technician
02/28/2017	SND152	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	0.99386	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.30399	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.2	%	**P**
5	Ozone % difference max	P	7	10	4	0.4	%	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Time maximum error		0	0	1			

EEMS Spot Report

Data Compiled: 4/6/2017 7:53:33 PM

SiteVisitDate	Site	Technician
03/13/2017	SPD111	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	1.01002	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.31528	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.7	%	**P**
5	Ozone % difference max	P	7	10	4	0.9	%	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Time maximum error		0	0	1			

EEMS Spot Report

Data Compiled: 4/6/2017 7:38:48 PM

SiteVisitDate	Site	Technician
02/23/2017	SUM156	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	0.98801	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.48935	ppb	**P**
3	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.0	%	**P**
5	Ozone % difference max	P	7	10	4	2.1	%	**P**

Records without valid pass/fail criteria

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	DAS Time maximum error		0	0	1			

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SUM156-Sandy Grenville-02/23/2017						
1	2/23/2017	DAS	Campbell	000335	CR3000	2114
2	2/23/2017	Ozone	ThermoElectron Inc	000724	49i A1NAA	1105347328
3	2/23/2017	Ozone Standard	ThermoElectron Inc	000511	49i A3NAA	0922236888
4	2/23/2017	Zero air pump	Werther International	06876	C 70/4	000814286

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347328	SUM156	Sandy Grenville	02/23/2017	Ozone	000724

Slope:	0.98801	**Slope:**	0.00000
Intercept	0.48935	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00879	**Intercept**	0.36382
Cert Date	2/8/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.0%	2.1%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.03	-0.33	0.15	ppb	
primary	2	15.69	15.19	15.51	ppb	2.11%
primary	3	35.05	34.38	34.52	ppb	0.41%
primary	4	70.03	69.05	68.60	ppb	-0.65%
primary	5	110.40	109.07	108.30	ppb	-0.71%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	0.2	pass
Span	0.987	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	115.8 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.73 lpm	pass
Cell A Pressure	719.3 mmHg	pass
Cell A Tmp.	36.8 C	pass
Cell B Freq.	96.5 kHz	pass
Cell B Noise	0.6 ppb	pass
Cell B Flow	0.66 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*
GAS153-Sandy Grenville-02/27/2017						
1	2/27/2017	DAS	Campbell	000635	CR3000	4934
2	2/27/2017	Ozone	ThermoElectron Inc	000705	49i A1NAA	1030244807
3	2/27/2017	Ozone Standard	ThermoElectron Inc	000371	49i A3NAA	0726124692
4	2/27/2017	Zero air pump	Werther International	06865	C 70/4	000814277

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244807	GAS153	Sandy Grenville	02/27/2017	Ozone	000705

Slope:	0.99653	**Slope:**	0.00000
Intercept	0.67934	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00879	**Intercept**	0.36382
Cert Date	2/8/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.2%	3.1%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.03	-0.33	0.85	ppb	
primary	2	15.04	14.54	14.99	ppb	3.09%
primary	3	35.05	34.38	34.29	ppb	-0.26%
primary	4	69.99	69.01	69.72	ppb	1.03%
primary	5	110.47	109.14	109.50	ppb	0.33%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	Not functioning	fail
Offset	0.10	pass
Span	1.022	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	103.6 kHz	pass
Cell A Noise	1.3 ppb	pass
Cell A Flow	0.60 lpm	pass
Cell A Pressure	727.6 mmHg	pass
Cell A Tmp.	36.8 C	pass
Cell B Freq.	97.5 kHz	pass
Cell B Noise	1.3 ppb	pass
Cell B Flow	0.61 lpm	pass
Cell B Pressure	726.7 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*
SND152-Sandy Grenville-02/28/2017						
1	2/28/2017	DAS	Campbell	000357	CR3000	2135
2	2/28/2017	Ozone	ThermoElectron Inc	000725	49i A1NAA	1106347326
3	2/28/2017	Ozone Standard	ThermoElectron Inc	000220	49i A3NAA	0622717868
4	2/28/2017	Zero air pump	Werther International	06900	PC70/4	000821894

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1106347326	SND152	Sandy Grenville	02/28/2017	Ozone	000725

Slope:	0.99386	**Slope:**	0.00000
Intercept	0.30399	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00879	**Intercept**	0.36382
Cert Date	2/8/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.2%	0.4%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.08	-0.28	0.34	ppb	
primary	2	15.04	14.54	14.57	ppb	0.21%
primary	3	35.04	34.37	34.31	ppb	-0.17%
primary	4	70.60	69.62	69.36	ppb	-0.37%
primary	5	111.04	109.71	109.50	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	0.20	pass
Span	0.994	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	101.2 kHz	pass
Cell A Noise	0.8 ppb	pass
Cell A Flow	0.66 lpm	pass
Cell A Pressure	704.8 mmHg	pass
Cell A Tmp.	34.0 C	pass
Cell B Freq.	91.0 kHz	pass
Cell B Noise	0.6 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*
SPD111-Sandy Grenville-03/13/2017						
1	3/13/2017	DAS	Campbell	000342	CR3000	2121
2	3/13/2017	Ozone	ThermoElectron Inc	000742	49i A1NAA	1105347313
3	3/13/2017	Ozone Standard	ThermoElectron Inc	000450	49i A3NAA	CM08200026
4	3/13/2017	Zero air pump	Werther International	06928	C 70/4	000822222

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347313	SPD111	Sandy Grenville	03/13/2017	Ozone	000742

Slope:	1.01002	**Slope:**	0.00000
Intercept	-0.31528	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00879	**Intercept**	0.36382
Cert Date	2/8/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.7%	0.9%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.99	0.62	0.05	ppb	
primary	2	14.88	14.38	14.27	ppb	-0.76%
primary	3	35.10	34.43	34.65	ppb	0.64%
primary	4	72.50	71.50	72.12	ppb	0.87%
primary	5	110.66	109.33	109.90	ppb	0.52%

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	1.005	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	93.4 kHz	pass
Cell A Noise	0.7 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	697.0 mmHg	pass
Cell A Tmp.	36.3 C	pass
Cell B Freq.	96.7 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.45 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*
ESP127-Sandy Grenville-03/16/2017						
1	3/16/2017	DAS	Campbell	illegible	CR3000	3817
2	3/16/2017	Ozone	ThermoElectron Inc	000622	49i A1NAA	1009241785
3	3/16/2017	Ozone Standard	ThermoElectron Inc	000327	49i A3NAA	0622717852
4	3/16/2017	Zero air pump	Werther International	06874	C 70/4	000815256

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241785	ESP127	Sandy Grenville	03/16/2017	Ozone	000622

Slope:	1.00432	**Slope:**	0.00000
Intercept	0.47637	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00879	**Intercept**	0.36382
Cert Date	2/8/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.5%	2.9%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	-0.03	-0.39	0.45	ppb	
primary	2	14.96	14.46	14.27	ppb	-1.31%
primary	3	35.14	34.47	35.47	ppb	2.90%
primary	4	71.97	70.98	71.79	ppb	1.14%
primary	5	110.42	109.09	110.00	ppb	0.83%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	N/A	pass
Offset	-0.10	pass
Span	1.020	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	94.7 kHz	pass
Cell A Noise	0.5 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	716.1 mmHg	pass
Cell A Tmp.	31.8 C	pass
Cell B Freq.	88.5 kHz	pass
Cell B Noise	0.7 ppb	pass
Cell B Flow	0.69 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*
IRL141-Eric Hebert-03/17/2017						
1	3/17/2017	DAS	Campbell	000340	CR3000	2119
2	3/17/2017	Ozone	ThermoElectron Inc	000625	49i A1NAA	1008241787
3	3/17/2017	Ozone Standard	ThermoElectron Inc	000446	49i A3NAA	CM08200022
4	3/17/2017	Zero air pump	Werther International	06898	C 70/4	000821905

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1008241787	IRL141	Eric Hebert	03/17/2017	Ozone	000625

Slope:	0.98534	**Slope:**	0.00000
Intercept	-0.72332	**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	1.00560	**Intercept**	0.06720
Cert Date	3/21/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
3.6%	6.1%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.20	0.13	-0.65	ppb	
primary	2	13.58	13.43	12.61	ppb	-6.11%
primary	3	35.15	34.88	33.58	ppb	-3.73%
primary	4	71.30	70.83	69.10	ppb	-2.44%
primary	5	110.13	109.44	107.10	ppb	-2.14%

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	1.029	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	103.9 kHz	pass
Cell A Noise	1.3 ppb	pass
Cell A Flow	0.75 lpm	pass
Cell A Pressure	744.3 mmHg	pass
Cell A Tmp.	30.8 C	pass
Cell B Freq.	98.7 kHz	pass
Cell B Noise	1.3 ppb	pass
Cell B Flow	0.76 lpm	pass
Cell B Pressure	743.6 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*
COW137-Sandy Grenville-03/23/2017						
1	3/23/2017	DAS	Campbell	000401	CR3000	2529
2	3/23/2017	Ozone	ThermoElectron Inc	000726	49i A1NAA	1105347314
3	3/23/2017	Ozone Standard	ThermoElectron Inc	000441	49i A3NAA	CM08200017
4	3/23/2017	UPS	APC	none	650	unknown
5	3/23/2017	Zero air pump	Werther International	06878	C 70/4	000815254

Ozone Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347314	COW137	Sandy Grenville	03/23/2017	Ozone	000726

Slope:	0.99635	**Slope:**	0.00000
Intercept	0.41148	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	517112175	**Tfer Desc.**	Ozone primary stan
Tfer ID	01111		
Slope	1.00250	**Intercept**	0.45870
Cert Date	3/21/2017	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.0%	2.2%		

UseDescription	ConcGroup	Tfer Raw	Tfer Corr	Site	Site Unit	PctDifference
primary	1	0.03	-0.42	0.23	ppb	
primary	2	16.04	15.54	15.88	ppb	2.19%
primary	3	35.80	35.25	35.50	ppb	0.71%
primary	4	72.38	71.74	71.31	ppb	-0.60%
primary	5	111.04	110.30	110.70	ppb	0.36%

Sensor Component	Condition	Status
Sample Train	Good	pass
22.5 degree rule		pass
Inlet Filter Condition	Clean	pass
Battery Backup	Not functioning	Fail
Offset	0.20	pass
Span	1.020	pass
Zero Voltage	N/A	pass
Fullscale Voltage	N/A	pass
Cell A Freq.	118.8 kHz	pass
Cell A Noise	0.6 ppb	pass
Cell A Flow	0.68 lpm	pass
Cell A Pressure	689.3 mmHg	pass
Cell A Tmp.	33.0 C	pass
Cell B Freq.	96.6 kHz	pass
Cell B Noise	0.9 ppb	pass
Cell B Flow	0.68 lpm	pass
Cell B Pressure	689.9 mmHg	pass
Cell B Tmp.		pass
Line Loss	Not tested	pass
System Memo		pass