2015 – 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

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May 2015

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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 June 2015, the network is comprised of 93 active rural sampling sites across the Untied States and Canada, cooperatively operated by the Environmental Protection Agency (EPA), the National Park Service (NPS), the Bureau of Land Management (BLM), Environment Canada, and several independent partners. 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 sponsored by EPA and operated by the BLM in WY also operate meteorological sensors and are BAS601, NEC602, BUF603, SHE604, and FOR605.

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, and BEL116. No sites that measure these variables were audited in first quarter 2015.

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
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
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	0.9000 ≤ m ≤ 1.1000
Ozone	Intercept		-5.0 ppb ≤ b ≤ 5.0 ppb

Sensor	Parameter	Audit Challenge	Acceptance Criteria
Ozone	Correlation Coefficient	transfer standard	$0.9950 \leq r$
DAS	Accuracy	Comparison with certified standard	$\leq \pm 0.003$ 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 2015

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 2015. The locations and dates of the audits are presented in Table 2.

Table 2. Site Audit Visits

Site ID	Audit Type	Sponsor	Site Location	Visit dates
EVE419	Audit w/o met	NPS	Everglades NP	2/10/2015
CAD150	Audit w/o met	EPA	Caddo Valley	2/27/2015
CVL151	Audit w/o met	EPA	Coffeeville	2/28/2015
CDZ171	Audit w/o met	EPA	Cadiz	3/13/2015
MCK131	Audit w/o met	EPA	Mackville	3/15/2015
MCK231	Audit w/o met	EPA	Mackville (precision site)	3/15/2015
MAC426	Audit w/o met	NPS	Mammoth Cave NP	3/17/2015
CKT136	Audit w/o met	EPA	Crockett	3/18/2015

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) ozone Performance Evaluations (PE).

Table 3. Site Ozone PE Visits

Site ID	Sponsor Agency	Site Location	Visit dates
SUM156	EPA	Sumatra	2/10/2015
IRL141	EPA	Indian River Lagoon	2/11/2015
GAS153	EPA	Georgia Station	2/25/2015
SND152	EPA	Sand Mountain	3/1/2015
SPD111	EPA	Speedwell	3/19/2015
COW137	EPA	Coweeta	3/20/2015
ESP127	EPA	Edgar Evins St. Park	3/26/2015

1.4 Audit Results

The observations and results of the systems and performance audits are included in Appendix A, *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, *Site Spot Report Forms*.

The Ozone PE results and observations are included in Appendix C, *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 100 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 Eurofins, and the network equipment depot (NED).

2.2 Project Objectives

The objective of this project is to perform independent and unbiased evaluations of the site instruments and 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 2015

This report covers the results from the NADP sites surveyed during the first quarter (January through March) of 2015. The station names and dates of the surveys are presented in Table 4.

Table 4. Sites Surveyed

Side ID	Network	Survey Date	Station Name
AL19	MDN /NTN	2/24/2015	Birmingham
FL32	NTN	2/17/2015	Orlando
FL96	MDN / NTN	2/9/2015	Pensacola
NC25	NTN	3/20/2015	Coweeta

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 NADP site 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*
EVE419-Eric Hebert-02/10/2015						
1	2/10/2015	DAS	Environmental Sys Corp	90642	8816	2527
2	2/10/2015	Elevation	Elevation	None	1	None
3	2/10/2015	Filter pack flow pump	Thomas	none	107CAB18B	071100039615
4	2/10/2015	Flow Rate	Porter	none	MPC05-88NSP1	4667040001001
5	2/10/2015	Infrastructure	Infrastructure	none	none	none
6	2/10/2015	Modem	US Robotics	none	56k	unknown
7	2/10/2015	Sample Tower	Aluma Tower	none	B	AT-71102-71-2
8	2/10/2015	Siting Criteria	Siting Criteria	None	1	None

DAS Data Form

DAS Time Max Error: 3.57

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	2527	EVE419	Eric Hebert	02/10/2015	DAS	Primary

Das Date: 2 /11/2015
Das Time: 11:02:26
Das Day: 42

Audit Date 2 /11/2015
Audit Time 11:06:00
Audit Day 42

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0003	0.0001	0.0002

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

Mfg	Fluke	**Parameter**	DAS
Serial Number	86590148	**Tfer Desc.**	DVM
Tfer ID	01310		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2014	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
8	0.0000	0.0003	0.0003	V	V	0.0000
8	0.1000	0.1000	0.1000	V	V	0.0000
8	0.3000	0.3000	0.2999	V	V	-0.0001
8	0.5000	0.4998	0.4999	V	V	0.0001
8	0.7000	0.7000	0.7000	V	V	0.0000
8	0.9000	0.9003	0.9003	V	V	0.0000
8	1.0000	1.0005	1.0002	V	V	-0.0003
16	0.0000	0.0000	0.0000	V	V	0.0000
16	0.1000	0.1000	0.1000	V	V	0.0000
16	0.3000	0.3001	0.3001	V	V	0.0000
16	0.5000	0.5000	0.4999	V	V	-0.0001
16	0.7000	0.7002	0.7003	V	V	0.0001
16	0.9000	0.9000	0.9000	V	V	0.0000
16	1.0000	1.0008	1.0006	V	V	-0.0002

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Porter	4667040001001	EVE419	Eric Hebert	02/10/2015	Flow Rate	none

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	131818	**Tfer Desc.**	BIOS 220-H
Tfer ID	01417		
Slope	1.00316	**Intercept**	-0.00540
Cert Date	1/7/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:			
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di	Cal Factor Zero	0.027
0.42%	0.52%			Cal Factor Full Scale	5.003
				Rotometer Reading:	3.05

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.00	0.0160	0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.02	0.0350	0.06	l/m	l/m	
primary	test pt 1	0.000	2.985	2.98	2.9840	3.00	l/m	l/m	0.35%
primary	test pt 2	0.000	2.986	2.98	2.9840	3.00	l/m	l/m	0.32%
primary	test pt 3	0.000	2.980	2.98	2.9840	3.00	l/m	l/m	0.52%
primary	test pt 4	0.000	2.981	2.98	2.9840	3.00	l/m	l/m	0.49%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270	**Status**	pass
Sensor Component	Filter Depth	**Condition**	-0.5 cm	**Status**	Fail
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**	See comments	**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass

Infrastructure Data For

Site ID	EVE419	Technician	Eric Hebert	Site Visit Date	02/10/2015

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

Sensor Component		Condition		Status	
Sensor Component	Shelter Roof	Condition	Fair	Status	pass
Sensor Component	Sample Tower Type	Condition	Type B	Status	pass
Sensor Component	Met Tower	Condition	N/A	Status	pass
Sensor Component	Moisture Trap	Condition	Not installed	Status	Fail
Sensor Component	Power Cables	Condition	Good	Status	pass
Sensor Component	Rotometer	Condition	Installed	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Sample Tower	Condition	Fair	Status	pass
Sensor Component	Shelter Condition	Condition	Good	Status	pass
Sensor Component	Shelter Floor	Condition	Good	Status	pass
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Signal Cable	Condition	Fair	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Shelter Door	Condition	Good	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	02/10/2015	Filter Position	Porter	4004	☐	☑

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Assistance was provided to the site operators regarding questions relating to the new SSRF. Corrections were made to the previous week's form to account for the non-routine sample duration.

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. ARS is repairing the leak in the roof.

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. This is a change from the previous temperature measurements which were made with an RTD in a forced-air aspirated shield at approximately 9 meters from the ground.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	EVE419	**Technician**	Eric Hebert	**Site Visit Date**	02/10/2015

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. ARS is repairing the leak in the roof.				
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-rev001

Site ID EVE419 **Technician** Eric Hebert **Site Visit Date** 02/10/2015

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-rev001

Site ID	EVE419	Technician	Eric Hebert	Site Visit Date	02/10/2015

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. This is a change from the previous temperature measurements which were made with an RTD in a forced-air aspirated shield at approximately 9 meters from the ground.

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID	EVE419	Technician	Eric Hebert	Site Visit Date	02/10/2015

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-rev001

Site ID EVE419 **Technician** Eric Hebert **Site Visit Date** 02/10/2015

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	AT-71102-71-2	none
Filter pack flow pump	Thomas	107CAB18B	071100039615	none

Provide any additional 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-rev001

Site ID EVE419 **Technician** Eric Hebert **Site Visit Date** 02/10/2015

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?		

Parameter	Manufacturer	Model	S/N	Client ID
DAS	Environmental Sys Corp	8816	2527	90642
Modem	US Robotics	56k	unknown	none

Provide any additional 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-rev001

Site ID	EVE419	Technician	Eric Hebert	Site Visit Date	02/10/2015

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-rev001

Site ID	EVE419	Technician	Eric Hebert	Site Visit Date	02/10/2015

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	☑	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-rev001

Site ID	EVE419	Technician	Eric Hebert	Site Visit Date	02/10/2015

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?	☑	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	☐		☐
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 new SSRF. Corrections were made to the previous week's form to account for the non-routine sample duration.

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CAD150-Sandy Grenville-02/27/2015						
1	2/27/2015	Computer	Dell	000306	D520	unknown
2	2/27/2015	DAS	Campbell	000421	CR3000	2530
3	2/27/2015	Elevation	Elevation	None	1	None
4	2/27/2015	Filter pack flow pump	Thomas	00462	107CA110	09883403-01-4
5	2/27/2015	Flow Rate	Apex	000602	AXMC105LPMDPCV	illegible
6	2/27/2015	Infrastructure	Infrastructure	none	none	none
7	2/27/2015	Modem	Raven	06469	H4222-C	0808310608
8	2/27/2015	Ozone	ThermoElectron Inc	000624	49i A1NAA	1009241792
9	2/27/2015	Ozone Standard	ThermoElectron Inc	000495	49i A3NAA	0622717849
10	2/27/2015	Sample Tower	Aluma Tower	03538	A	none
11	2/27/2015	Shelter Temperature	Campbell	none	107-L	none
12	2/27/2015	Siting Criteria	Siting Criteria	None	1	None
13	2/27/2015	Temperature	Climatronics	06777	100093	none
14	2/27/2015	Zero air pump	Werther International	06882	C 70/4	000815255

DAS Data Form

DAS Time Max Error: 0.05

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2530	CAD150	Sandy Grenville	02/27/2015	DAS	Primary

Das Date: 2 /27/2015
Das Time: 14:22:10
Das Day: 57

Audit Date 2 /27/2015
Audit Time 14:22:13
Audit Day 57

Low Channel:

Avg Diff:	Max Diff:
0.0001	0.0005

High Channel:

Avg Diff:	Max Diff:
0.0001	0.0005

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/2/2010	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	0.0000	0.0005	V	V	0.0005
7	0.1000	0.0999	0.1000	V	V	0.0001
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4997	0.4997	V	V	0.0000
7	0.7000	0.6995	0.6996	V	V	0.0001
7	0.9000	0.8994	0.8995	V	V	0.0001
7	1.0000	0.9993	0.9994	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CAD150	Sandy Grenville	02/27/2015	Flow Rate	000602

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.03
0.18%	0.20%			**Cal Factor Full Scale**	0.98
				Rotometer Reading:	1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	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	0.090	-0.06	l/m	l/m	
primary	test pt 1	1.451	1.503	1.52	1.520	1.50	l/m	l/m	-0.20%
primary	test pt 2	1.449	1.502	1.52	1.520	1.50	l/m	l/m	-0.13%
primary	test pt 3	1.450	1.503	1.52	1.520	1.50	l/m	l/m	-0.20%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241792	CAD150	Sandy Grenville	02/27/2015	Ozone	000624

Slope:	1.01673	**Slope:**	0.00000
Intercept	0.00908	**Intercept**	0.00000
CorrCoff	0.99992	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99909	**Intercept**	-0.15598
Cert Date	1/27/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.0%	2.6%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.18	0.33	-0.06	ppb	
primary	2	29.92	30.10	30.70	ppb	1.99%
primary	3	49.94	50.14	51.25	ppb	2.21%
primary	4	79.91	80.13	82.20	ppb	2.58%
primary	5	110.06	110.31	111.50	ppb	1.08%

Sensor Component	Condition	Status
Cell B Noise	1.4 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Dirty	Fail
Line Loss	Not tested	pass
Offset	0.2	pass
Span	1.037	pass
Cell B Freq.	108.9 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.78 lpm	pass
Cell A Tmp.	29.6 C	pass
Cell A Pressure	744.5 mmHg	pass
Cell A Noise	1.0 ppb	pass
Cell A Freq.	118.9 kHz	pass
Cell A Flow	0.78 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	none	CAD150	Sandy Grenville	02/27/2015	Temperature	06777

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00343	**Intercept**	-0.06409
Cert Date	1/30/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.03	0.05		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	-0.10	-0.04	0.000	0.0	C	0.05
primary	Temp Mid Range	25.49	25.47	0.000	25.5	C	0.04
primary	Temp High Range	47.34	47.24	0.000	47.2	C	-0.01

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

Infrastructure Data For

Site ID	CAD150	Technician	Sandy Grenville	Site Visit Date	02/27/2015

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CAD150	Sandy Grenville	02/27/2015	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.42	0.52		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00343	Intercept	-0.06409
Cert Date	1/30/2015	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	18.44	18.44	0.000	17.9	C	-0.52
primary	Temp Mid Range	20.14	20.14	0.000	19.7	C	-0.45
primary	Temp Mid Range	20.20	20.19	0.000	19.9	C	-0.29

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone analyzer sample train filter is replaced and the system is leak tested monthly.

2 **Parameter:** ShelterCleanNotes

The bottom of the shelter walls are very badly deteriorated. The floor and ceiling have been repaired.

3 **Parameter:** MetOpMaintCom

The shelter is in poor condition. The bottom of the walls have rot damage. The front wall and the section below the heater are severely damaged by ants.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	CAD150	**Technician**	Sandy Grenville	**Site Visit Date**	02/27/2015

Site Sponsor (agency)	EPA	**USGS Map**	Caddo Valley
Operating Group	Ouachita Baptist University	**Map Scale**	
AQS #		**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone	**QAPP Latitude**	34.1792
Deposition Measurement	dry, wet	**QAPP Longitude**	-93.0989
Land Use	woodland - mixed	**QAPP Elevation Meters**	71
Terrain	gently rolling	**QAPP Declination**	2.3
Conforms to MLM	Marginally	**QAPP Declination Date**	12/28/2004
Site Telephone	(870) 246-0030	**Audit Latitude**	34.179278
Site Address 1	DeGray Regulating Dam	**Audit Longitude**	-93.098755
Site Address 2	Route 390	**Audit Elevation**	78
County	Clark	**Audit Declination**	1.3
City, State	Arkadelphia, AR		**Present**
Zip Code	71923	**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**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The bottom of the shelter walls are very badly deteriorated. The floor and ceiling have been repaired.				
Site OK	☑	**Notes**					

Driving Directions From Interstate 30 in Arkadelphia take exit 78 and turn west on route 7. Go south on Lower Dam Pike, route 390, immediately west of the interstate. This road runs parallel to the interstate for approximately 1/2 mile and then turns west. Continue for approximately 1 mile, the site will be on the left just before the dam.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID CAD150 **Technician** Sandy Grenville **Site Visit Date** 02/27/2015

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-rev001

Site ID	CAD150	Technician	Sandy Grenville	Site Visit Date	02/27/2015

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-rev001

Site ID CAD150 **Technician** Sandy Grenville **Site Visit Date** 02/27/2015

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	Climatronics	100093	none	06777

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

The shelter is in poor condition. The bottom of the walls have rot damage. The front wall and the section below the heater are severely damaged by ants.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID	CAD150	Technician	Sandy Grenville	Site Visit Date	02/27/2015

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	A	none	03538
Ozone	ThermoElectron Inc	49i A1NAA	1009241792	000624
Filter pack flow pump	Thomas	107CA110	09883403-01-4	00462
Zero air pump	Werther International	C 70/4	000815255	06882

Provide any additional 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-rev001

Site ID CAD150 **Technician** Sandy Grenville **Site Visit Date** 02/27/2015

DAS, sensor translators, and peripheral equipment operations and maintenance

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

		Stable	Grounded
9	Is the met tower stable and grounded?	☑	☑
10	Is the sample tower stable and grounded?	☑	☐
11	Tower comments?	Sample tower is stable but not grounded	

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000306
DAS	Campbell	CR3000	2530	000421
Modem	Raven	H4222-C	0808310608	06469

Provide any additional 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-rev001

Site ID	CAD150	Technician	Sandy Grenville	Site Visit Date	02/27/2015

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 2009	☑
Field Ops Manual	☑	July 1990	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	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-rev001

Site ID CAD150 **Technician** Sandy Grenville **Site Visit Date** 02/27/2015

Site operation procedures

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

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

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

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

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

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

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

The ozone analyzer sample train filter is replaced and the system is leak tested monthly.

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID	CAD150	Technician	Sandy Grenville	Site Visit Date	02/27/2015

Site operation procedures

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

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

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

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CVL151-Sandy Grenville-02/28/2015						
1	2/28/2015	Computer	Dell	000477	D630	unknown
2	2/28/2015	DAS	Campbell	000410	CR3000	2508
3	2/28/2015	Elevation	Elevation	None	1	None
4	2/28/2015	Filter pack flow pump	Thomas	04282	107CAB18B	129800010140
5	2/28/2015	Flow Rate	Apex	000461	AXMC105LPMDPCV	illegible
6	2/28/2015	Infrastructure	Infrastructure	none	none	none
7	2/28/2015	Modem	Raven	06462	V42221	0808338333
8	2/28/2015	Ozone	ThermoElectron Inc	000698	49i A1NAA	1030244797
9	2/28/2015	Ozone Standard	ThermoElectron Inc	000464	49i A3NAA	0622717858
10	2/28/2015	Sample Tower	Aluma Tower	03540	A	none
11	2/28/2015	Shelter Temperature	Campbell	none	107-L	none
12	2/28/2015	Siting Criteria	Siting Criteria	None	1	None
13	2/28/2015	Temperature	Climatronics	06770	100093	none
14	2/28/2015	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	02/28/2015	DAS	Primary

Das Date: 2 /28/2015
Das Time: 15:38:27
Das Day: 58

Audit Date 2 /28/2015
Audit Time 15:38:27
Audit Day 58

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

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/2/2010	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

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

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CVL151	Sandy Grenville	02/28/2015	Flow Rate	000461

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.02
1.06%	1.32%			**Cal Factor Full Scale**	0.97
				Rotometer Reading:	1.4

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	-0.02	0.000	-0.02	l/m	l/m	
primary	leak check	0.000	0.000	0.03	0.020	0.00	l/m	l/m	
primary	test pt 1	1.457	1.513	1.54	1.540	1.50	l/m	l/m	-0.86%
primary	test pt 2	1.464	1.520	1.54	1.540	1.50	l/m	l/m	-1.32%
primary	test pt 3	1.460	1.515	1.54	1.530	1.50	l/m	l/m	-0.99%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	360 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	2.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244797	CVL151	Sandy Grenville	02/28/2015	Ozone	000698

Slope:	1.00543	**Slope:**	0.00000
Intercept	-0.58714	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99909	**Intercept**	-0.15598
Cert Date	1/27/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.7%	1.9%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.14	0.29	-0.17	ppb	
primary	2	29.77	29.95	29.37	ppb	-1.94%
primary	3	49.71	49.91	49.56	ppb	-0.70%
primary	4	79.57	79.79	79.66	ppb	-0.16%
primary	5	109.60	109.85	109.90	ppb	0.05%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.3	pass
Span	1.02	pass
Cell B Freq.	101 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.70 lpm	pass
Cell A Tmp.	29.8 C	pass
Cell A Pressure	736 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	96.5 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Climatronics	none	CVL151	Sandy Grenville	02/28/2015	Temperature	06770

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00343	**Intercept**	-0.06409
Cert Date	1/30/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.13	0.26		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.12	0.18	0.000	0.2	C	0
primary	Temp Mid Range	24.36	24.34	0.000	24.5	C	0.12
primary	Temp High Range	48.22	48.12	0.000	48.4	C	0.26

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

Infrastructure Data For

Site ID	Technician	Site Visit Date
CVL151	Sandy Grenville	02/28/2015

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CVL151	Sandy Grenville	02/28/2015	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.37	0.50		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00343	Intercept	-0.06409
Cert Date	1/30/2015	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	18.89	18.89	0.000	18.7	C	-0.21
primary	Temp Mid Range	19.90	19.90	0.000	19.4	C	-0.5
primary	Temp Mid Range	19.45	19.45	0.000	19.1	C	-0.4

Field Systems Comments

1 **Parameter:** DocumentationCo

The site operations manual does not apply to the currently installed instrumentation. The current HASP is not available onsite.

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 floor has been repaired since the previous audit visit, however the roof is still leaking.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	CVL151	**Technician**	Sandy Grenville	**Site Visit Date**	02/28/2015

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** ☑	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**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is somewhat cluttered. The floor has been repaired since the previous audit visit, however the roof is still leaking.				
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-rev001

Site ID CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/28/2015

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-rev001

Site ID CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/28/2015

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-rev001

Site ID	Technician	Site Visit Date
CVL151	Sandy Grenville	02/28/2015

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	Climatronics	100093	none	06770

Provide any additional 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-rev001

Site ID	CVL151	Technician	Sandy Grenville	Site Visit Date	02/28/2015

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?	☑	
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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	A	none	03540
Ozone	ThermoElectron Inc	49i A1NAA	1030244797	000698
Filter pack flow pump	Thomas	107CAB18B	129800010140	04282
Zero air pump	Werther International	PC70/4	000815263	06884

Provide any additional 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-rev001

Site ID CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/28/2015

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?		

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D630	unknown	000477
DAS	Campbell	CR3000	2508	000410
Modem	Raven	V42221	0808338333	06462

Provide any additional 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-rev001

Site ID CVL151 **Technician** Sandy Grenville **Site Visit Date** 02/28/2015

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	☑	Nov 2001	☐
Field Ops Manual	☑	July 1990	☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

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

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

The site operations manual does not apply to the currently installed instrumentation. The current HASP is not available onsite.

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID	CVL151	Technician	Sandy Grenville	Site Visit Date	02/28/2015

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Trained by J.B. Anderson during site upgrade
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?	☑	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-rev001

Site ID	CVL151	Technician	Sandy Grenville	Site Visit Date	02/28/2015

Site operation procedures

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

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

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

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CDZ171-Sandy Grenville-03/13/2015					
1 3/13/2015	Computer	Dell	000281	D520	unknown
2 3/13/2015	DAS	Campbell	000352	CR3000	2130
3 3/13/2015	Elevation	Elevation	None	1	None
4 3/13/2015	Filter pack flow pump	Thomas	06020	107CAB18D	060400022646
5 3/13/2015	Flow Rate	Apex	000650	AXMC105LPMDPCV	54767
6 3/13/2015	Infrastructure	Infrastructure	none	none	none
7 3/13/2015	Modem	Raven	06457	V42221	0808338189
8 3/13/2015	Ozone	ThermoElectron Inc	000727	49i A1NAA	1105347320
9 3/13/2015	Ozone Standard	ThermoElectron Inc	000544	49i A3NAA	0929938242
10 3/13/2015	Sample Tower	Aluma Tower	000125	B	none
11 3/13/2015	Shelter Temperature	Campbell	none	107-L	none
12 3/13/2015	Siting Criteria	Siting Criteria	None	1	None
13 3/13/2015	Temperature	RM Young	06403	41342VC	14036
14 3/13/2015	Zero air pump	Werther International	06899	PC70/4	000821902

DAS Data Form

DAS Time Max Error: 0.02

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2130	CDZ171	Sandy Grenville	03/13/2015	DAS	Primary

Das Date: 3 /13/2015
Das Time: 16:43:53
Das Day: 72

Audit Date 3 /13/2015
Audit Time 16:43:54
Audit Day 72

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	2/2/2010	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

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

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	54767	CDZ171	Sandy Grenville	03/13/2015	Flow Rate	000650

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0
0.35%	0.53%			**Cal Factor Full Scale**	1.01
				Rotometer Reading:	1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.00	0.010	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.010	0.01	l/m	l/m	
primary	test pt 1	1.504	1.518	1.50	1.500	1.51	l/m	l/m	-0.53%
primary	test pt 2	1.502	1.514	1.50	1.500	1.51	l/m	l/m	-0.26%
primary	test pt 3	1.507	1.516	1.50	1.500	1.52	l/m	l/m	0.26%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	140 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	3.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347320	CDZ171	Sandy Grenville	03/13/2015	Ozone	000727

Slope:	1.01264	**Slope:**	0.00000
Intercept	-0.64212	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99405	**Intercept**	-0.42803
Cert Date	3/9/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.5%	0.7%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.09	0.52	-0.24	ppb	
primary	2	29.91	30.51	30.60	ppb	0.29%
primary	3	50.08	50.81	50.58	ppb	-0.45%
primary	4	79.93	80.83	81.20	ppb	0.46%
primary	5	110.04	111.12	111.90	ppb	0.70%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	1.007	pass
Cell B Freq.	93.1 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.71 lpm	pass
Cell A Tmp.	31.5 C	pass
Cell A Pressure	719.1 mmHg	pass
Cell A Noise	1.0 ppb	pass
Cell A Freq.	96.9 kHz	pass
Cell A Flow	0.71 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14036	CDZ171	Sandy Grenville	03/13/2015	Temperature	06403

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00343	**Intercept**	-0.06409
Cert Date	1/30/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.27	0.48		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.10	0.16	0.000	0.1	C	-0.06
primary	Temp Mid Range	24.95	24.93	0.000	24.7	C	-0.28
primary	Temp High Range	48.32	48.22	0.000	47.7	C	-0.48

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

Infrastructure Data For

Site ID	Technician	Site Visit Date
CDZ171	Sandy Grenville	03/13/2015

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Campbell	none	CDZ171	Sandy Grenville	03/13/2015	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.62	0.67		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00343	Intercept	-0.06409
Cert Date	1/30/2015	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	25.50	25.48	0.000	24.8	C	-0.67
primary	Temp Mid Range	25.15	25.13	0.000	24.6	C	-0.53
primary	Temp Mid Range	24.40	24.38	0.000	23.7	C	-0.67

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Tower is still being lowered and the deposition filter changed without downing ozone channel. This is a new site operator who has been partially trained by the previous backup site operator. He would benefit from additional training. It was observed that he did not complete the SSRF correctly and was unsure of some of the required instrument checks.

2 **Parameter:** SitingCriteriaCom

The site is in a corn field with limited agricultural operations within 15 meters.

3 **Parameter:** ShelterCleanNotes

The shelter floor is beginning to rot again by the door. The shelter is still cluttered and dirty.

4 **Parameter:** PollAnalyzerCom

The zero air desiccant is saturated and should be replaced.

5 **Parameter:** MetSensorComme

The temperature sensor has been installed in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	CDZ171	**Technician**	Sandy Grenville	**Site Visit Date**	03/13/2015

Site Sponsor (agency)	EPA	**USGS Map**	Cadiz
Operating Group	private, TVA	**Map Scale**	
AQS #	21-221-9991	**Map Date**	
Meteorological Type	R.M. Young		
Air Pollutant Analyzer	Ozone, SO2, NOy, PM2.5, IMPROVE	**QAPP Latitude**	36.7841
Deposition Measurement	dry	**QAPP Longitude**	-87.8500
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	189
Terrain	gently rolling	**QAPP Declination**	-2.01
Conforms to MLM	Yes	**QAPP Declination Date**	2/23/2006
Site Telephone	(270) 522-9373	**Audit Latitude**	36.784053
Site Address 1	4560 Old Dover Road	**Audit Longitude**	-87.85015
Site Address 2	route 1175	**Audit Elevation**	190
County	Trigg	**Audit Declination**	-2.7
City, State	Cadiz, KY		
Zip Code	42211	**Fire Extinguisher** ☑	Inspected July 2014
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 floor is beginning to rot again by the door. The shelter is still cluttered and dirty.				
Site OK	☑	**Notes**					

Driving Directions From route 68 in Cadiz turn south on 1175 and continue approximately 4.7 miles. The site will be visible in the field on the right. Turn onto the gravel road just past the site operator's house at 4560 Old Dover Road, which is on the left.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID CDZ171 **Technician** Sandy Grenville **Site Visit Date** 03/13/2015

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	15 m	☐
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

The site is in a corn field with limited agricultural operations within 15 meters.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	CDZ171	Technician	Sandy Grenville	Site Visit Date	03/13/2015

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

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

The temperature sensor has been installed in a naturally aspirated shield on the sample tower.

Field Systems Data Form

F-02058-1500-S4-rev001

Site ID	CDZ171	Technician	Sandy Grenville	Site Visit Date	03/13/2015

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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VC	14036	06403

Provide any additional 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-rev001

Site ID	CDZ171	Technician	Sandy Grenville	Site Visit Date	03/13/2015

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 18 meters
4	Describe dry dep sample tube.		3/8 teflon by 15 meters
5	Are in-line filters used in the ozone sample line? (if yes indicate location)	☑	At inlet only
6	Are sample lines clean, free of kinks, moisture, and obstructions?	☑	
7	Is the zero air supply desiccant unsaturated?	☐	
8	Are there moisture traps in the sample lines?	☑	Flow line only
9	Is there a rotometer in the dry deposition filter line, and is it clean?	☑	Clean and dry

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	none	000125
Ozone	ThermoElectron Inc	49i A1NAA	1105347320	000727
Filter pack flow pump	Thomas	107CAB18D	060400022646	06020
Zero air pump	Werther International	PC70/4	000821902	06899

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

The zero air desiccant is saturated and should be replaced.

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID CDZ171 **Technician** Sandy Grenville **Site Visit Date** 03/13/2015

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	

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000281
DAS	Campbell	CR3000	2130	000352
Modem	Raven	V42221	0808338189	06457

Provide any additional 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-rev001

Site ID	CDZ171	Technician	Sandy Grenville	Site Visit Date	03/13/2015

Documentation

Does the site have the required instrument and equipment manuals?

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

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

	Present		Current
Station Log	☑		☑
SSRF	☑		☑
Site Ops Manual	☑	Oct 2001	☐
HASP	☑	Nov 2009	☐
Field Ops Manual	☐		☐
Calibration Reports	☐		☐
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	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-rev001

Site ID: CDZ171 Technician: Sandy Grenville Site Visit Date: 03/13/2015

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☐
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	☐		☐
Zero Air Desiccant Check	☑	Weekly	☑

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

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

Field Systems Data Form

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Site ID	CDZ171	Technician	Sandy Grenville	Site Visit Date	03/13/2015

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed afternoons (90% of the time)
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF
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	☐		☐

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

Tower is still being lowered and the deposition filter changed without downing ozone channel. This is a new site operator who has been partially trained by the previous backup site operator. He would benefit from additional training. It was observed that he did not complete the SSRF correctly and was unsure of some of the required instrument checks.

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MCK131-Sandy Grenville-03/15/2015						
1	3/15/2015	Computer	Dell	000457	D520	unknown
2	3/15/2015	DAS	Campbell	000429	CR3000	2535
3	3/15/2015	Elevation	Elevation	None	1	None
4	3/15/2015	Filter pack flow pump	Thomas	00497	107CA18	118700000596
5	3/15/2015	Flow Rate	Apex	000528	AXMC105LPMDPCV	48097
6	3/15/2015	Infrastructure	Infrastructure	none	none	none
7	3/15/2015	Modem	Raven	06477	H4222-C	0808311292
8	3/15/2015	Ozone	ThermoElectron Inc	000723	49i A1NAA	1105347327
9	3/15/2015	Ozone Standard	ThermoElectron Inc	000366	49i A3NAA	0726124695
10	3/15/2015	Sample Tower	Aluma Tower	03514	A	none
11	3/15/2015	Shelter Temperature	Campbell	none	107-L	none
12	3/15/2015	Siting Criteria	Siting Criteria	None	1	None
13	3/15/2015	Temperature	RM Young	04318	41342	4037
14	3/15/2015	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	03/15/2015	DAS	Primary

Das Date: 3 /15/2015
Das Time: 16:43:00
Das Day: 74

Audit Date 3 /15/2015
Audit Time 16:43:00
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	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/2/2010	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2997	0.2998	V	V	0.0001
7	0.5000	0.4995	0.4997	V	V	0.0002
7	0.7000	0.6995	0.6996	V	V	0.0001
7	0.9000	0.8994	0.8994	V	V	0.0000
7	1.0000	0.9992	0.9993	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	48097	MCK131	Sandy Grenville	03/15/2015	Flow Rate	000528

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.005
0.29%	0.46%			**Cal Factor Full Scale**	1.016
				Rotometer Reading:	1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	-0.01	-0.001	0.00	l/m	l/m	
primary	leak check	0.000	0.000	0.00	-0.002	0.00	l/m	l/m	
primary	test pt 1	1.549	1.504	1.48	1.479	1.50	l/m	l/m	-0.27%
primary	test pt 2	1.551	1.507	1.48	1.484	1.51	l/m	l/m	-0.13%
primary	test pt 3	1.550	1.506	1.48	1.478	1.50	l/m	l/m	-0.46%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	200 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.0 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347327	MCK131	Sandy Grenville	03/15/2015	Ozone	000723

Slope:	0.99746	**Slope:**	0.00000
Intercept	-0.87322	**Intercept**	0.00000
CorrCoff	0.99995	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99405	**Intercept**	-0.42803
Cert Date	3/9/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
2.3%	4.5%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.02	0.41	0.05	ppb	
primary	2	30.02	30.63	29.24	ppb	-4.54%
primary	3	49.99	50.71	49.29	ppb	-2.80%
primary	4	79.84	80.74	79.78	ppb	-1.19%
primary	5	109.75	110.83	109.90	ppb	-0.84%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.30	pass
Span	1.031	pass
Cell B Freq.	100.2 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	34.2 C	pass
Cell A Pressure	725.9 mmHg	pass
Cell A Noise	1.4 ppb	pass
Cell A Freq.	91.5 kHz	pass
Cell A Flow	0.67 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	4037	MCK131	Sandy Grenville	03/15/2015	Temperature	04318

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00343	**Intercept**	-0.06409
Cert Date	1/30/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.17	0.36		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.07	0.13	0.000	0.1	C	-0.04
primary	Temp Mid Range	25.10	25.08	0.000	25.0	C	-0.12
primary	Temp High Range	48.80	48.70	0.000	48.3	C	-0.36

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	Blower	**Condition**	Functioning	**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	03/15/2015	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.20	0.42		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00343	Intercept	-0.06409
Cert Date	1/30/2015	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	24.97	24.95	0.000	25.0	C	0.07
primary	Temp Mid Range	25.03	25.01	0.000	25.1	C	0.1
primary	Temp Mid Range	27.34	27.31	0.000	26.9	C	-0.42

Infrastructure Data For

Site ID	MCK131	Technician	Sandy Grenville	Site Visit Date	03/15/2015

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is neat, clean, and well organized.

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MCK231-Sandy Grenville-03/15/2015						
1	3/15/2015	Computer	Dell	000458	D530	unknown
2	3/15/2015	DAS	Campbell	000359	CR3000	2137
3	3/15/2015	Elevation	Elevation	None	1	None
4	3/15/2015	Filter pack flow pump	Thomas	04513	107CAB18B	110000014171
5	3/15/2015	Flow Rate	Apex	000529	AXMC105LPMDPCV	illegible
6	3/15/2015	Infrastructure	Infrastructure	none	none	none
7	3/15/2015	Modem	Raven	06476	H4222-C	0808311140
8	3/15/2015	Ozone	ThermoElectron Inc	000682	49i A1NAA	1030244796
9	3/15/2015	Ozone Standard	ThermoElectron Inc	000369	49i A3NAA	0726124690
10	3/15/2015	Shelter Temperature	Campbell	none	107-L	none
11	3/15/2015	Siting Criteria	Siting Criteria	None	1	None
12	3/15/2015	Temperature	RM Young	06542	41342VC	14803
13	3/15/2015	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	03/15/2015	DAS	Primary

Das Date: 3 /15/2015
Das Time: 16:51:10
Das Day: 74

Audit Date 3 /15/2015
Audit Time 16:51:10
Audit Day 74

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

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/2/2010	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0001	V	V	0.0002
7	0.1000	0.0998	0.1000	V	V	0.0002
7	0.3000	0.2997	0.3000	V	V	0.0003
7	0.5000	0.4996	0.5000	V	V	0.0004
7	0.7000	0.6995	0.7000	V	V	0.0005
7	0.9000	0.8994	0.8994	V	V	0.0000
7	1.0000	0.9992	0.9993	V	V	0.0001

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	MCK231	Sandy Grenville	03/15/2015	Flow Rate	000529

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	0.014
1.28%	1.75%			**Cal Factor Full Scale**	1.01
				Rotometer Reading:	1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.03	0.030	0.04	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.003	0.04	l/m	l/m	
primary	test pt 1	1.527	1.482	1.49	1.497	1.51	l/m	l/m	1.75%
primary	test pt 2	1.528	1.483	1.49	1.490	1.50	l/m	l/m	1.01%
primary	test pt 3	1.522	1.478	1.49	1.486	1.49	l/m	l/m	1.08%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	160 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	1.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244796	MCK231	Sandy Grenville	03/15/2015	Ozone	000682

Slope:	1.00750	**Slope:**	0.00000
Intercept	-0.57296	**Intercept**	0.00000
CorrCoff	0.99996	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99405	**Intercept**	-0.42803
Cert Date	3/9/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.0%	2.3%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.04	0.47	0.40	ppb	
primary	2	30.00	30.61	29.91	ppb	-2.29%
primary	3	50.18	50.91	50.35	ppb	-1.10%
primary	4	79.91	80.81	80.70	ppb	-0.14%
primary	5	109.99	111.07	111.70	ppb	0.57%

Sensor Component	Condition	Status
Cell B Noise	1.4 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.3	pass
Span	1.017	pass
Cell B Freq.	79.7 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.73 lpm	pass
Cell A Tmp.	35.7 C	pass
Cell A Pressure	712.5 mmHg	pass
Cell A Noise	1.6 ppb	pass
Cell A Freq.	96.4 kHz	pass
Cell A Flow	0.74 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	14803	MCK231	Sandy Grenville	03/15/2015	Temperature	06542

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00343	**Intercept**	-0.06409
Cert Date	1/30/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.21	0.41		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.07	0.13	0.000	0.1	C	-0.08
primary	Temp Mid Range	25.10	25.08	0.000	24.9	C	-0.14
primary	Temp High Range	48.80	48.70	0.000	48.3	C	-0.41

Sensor Component	Shield	**Condition**	Clean	**Status**	pass
Sensor Component	Blower Status Switch	**Condition**	N/A	**Status**	pass
Sensor Component	Blower	**Condition**	Functioning	**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	03/15/2015	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.45	0.76		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00343	Intercept	-0.06409
Cert Date	1/30/2015	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	29.60	29.56	0.000	30.3	C	0.76
primary	Temp Mid Range	25.20	25.18	0.000	25.3	C	0.13
primary	Temp Mid Range	23.40	23.38	0.000	23.8	C	0.46

Infrastructure Data For

Site ID	MCK231	Technician	Sandy Grenville	Site Visit Date	03/15/2015

Shelter Make	Shelter Model	Shelter Size
Ekto	8810	640 cuft

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

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Site ID	MCK131	**Technician**	Sandy Grenville	**Site Visit Date**	03/15/2015

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** ☑	Inspected Nov 1992
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☑	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

(Present)

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is 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-rev001

Site ID MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/15/2015

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-rev001

Site ID MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/15/2015

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-rev001

Site ID	MCK131	Technician	Sandy Grenville	Site Visit Date	03/15/2015

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342	4037	04318

Provide any additional 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-rev001

Site ID	MCK131	Technician	Sandy Grenville	Site Visit Date	03/15/2015

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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	A	none	03514
Ozone	ThermoElectron Inc	49i A1NAA	1105347327	000723
Filter pack flow pump	Thomas	107CA18	118700000596	00497
Zero air pump	Werther International	PC70/4	000829177	06912

Provide any additional 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-rev001

Site ID MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/15/2015

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?		

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000457
DAS	Campbell	CR3000	2535	000429
Modem	Raven	H4222-C	0808311292	06477

Provide any additional 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-rev001

Site ID	MCK131	Technician	Sandy Grenville	Site Visit Date	03/15/2015

Documentation

Does the site have the required instrument and equipment manuals?

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

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

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

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID	MCK131	Technician	Sandy Grenville	Site Visit Date	03/15/2015

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	☑	N/A	☑
Test Surface Wetness Response	☑	N/A	☑

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

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

1	Do multi-point calibration gases go through the complete sample train including all filters?	☐	Unknown
2	Do automatic and manual z/s/p gasses go through the complete sample train including all filters?	☑	
3	Are the automatic and manual z/s/p checks monitored and reported? If yes, how?	☑	SSRF, 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-rev001

Site ID MCK131 **Technician** Sandy Grenville **Site Visit Date** 03/15/2015

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-S1-rev001

Site ID	MCK231	**Technician**	Sandy Grenville	**Site Visit Date**	03/15/2015

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		
Zip Code	40330	**Fire Extinguisher** ☑	Inspected Nov 1992
Time Zone	Eastern	**First Aid Kit** ☑	
Primary Operator		**Safety Glasses** ☑	
Primary Op. Phone #		**Safety Hard Hat** ☑	
Primary Op. E-mail		**Climbing Belt** ☑	
Backup Operator		**Security Fence** ☐	
Backup Op. Phone #		**Secure Shelter** ☑	
Backup Op. E-mail		**Stable Entry Step** ☑	

Present

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The 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-rev001

Site ID MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/15/2015

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-rev001

Site ID	MCK231	Technician	Sandy Grenville	Site Visit Date	03/15/2015

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-rev001

Site ID MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/15/2015

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

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VC	14803	06542

Provide any additional 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-rev001

Site ID	MCK231	Technician	Sandy Grenville	Site Visit Date	03/15/2015

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

Parameter	Manufacturer	Model	S/N	Client ID
Ozone	ThermoElectron Inc	49i A1NAA	1030244796	000682
Filter pack flow pump	Thomas	107CAB18B	110000014171	04513
Zero air pump	Werther International	C 70/4	000836205	06924

Provide any additional 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-rev001

Site ID MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/15/2015

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?		

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D530	unknown	000458
DAS	Campbell	CR3000	2137	000359
Modem	Raven	H4222-C	0808311140	06476

Provide any additional 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-rev001

Site ID	MCK231	Technician	Sandy Grenville	Site Visit Date	03/15/2015

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	☑	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:

Field Systems Data Form

F-02058-1500-S8-rev001

Site ID	MCK231	Technician	Sandy Grenville	Site Visit Date	03/15/2015

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

Provide any additional 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-rev001

Site ID MCK231 **Technician** Sandy Grenville **Site Visit Date** 03/15/2015

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:

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
MAC426-Sandy Grenville-03/17/2015						
1	3/17/2015	Computer	Hewlett Packard	none	6730b	CNV0094B73
2	3/17/2015	DAS	Environmental Sys Corp	3027	8832	A3027
3	3/17/2015	Elevation	Elevation	None	1	None
4	3/17/2015	Filter pack flow pump	Thomas	none	107CAB11A	109500000033
5	3/17/2015	Flow Rate	Tylan	02023	FC280SAV	AW710253
6	3/17/2015	Infrastructure	Infrastructure	none	none	none
7	3/17/2015	Met tower	Climatronics	none	illegible	illegible
8	3/17/2015	MFC power supply	Tylan	03645	RO-32	FP9605011
9	3/17/2015	Ozone	ThermoElectron Inc	none	49i A3NAA	CM08460049
10	3/17/2015	Ozone Standard	ThermoElectron Inc	none	49i A1NAA	0733726104
11	3/17/2015	Printer	Hewlett Packard	none	842C	unknown
12	3/17/2015	Sample Tower	Aluma Tower	none	B	none
13	3/17/2015	Shelter Temperature	ARS	60	none	none
14	3/17/2015	Siting Criteria	Siting Criteria	None	1	None
15	3/17/2015	Temperature	RM Young	none	41342	15105
16	3/17/2015	Zero air pump	Werther International	none	PC70/4	000665778

DAS Data Form

DAS Time Max Error: 0.42

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Environmental Sys	A3027	MAC426	Sandy Grenville	03/17/2015	DAS	Primary

Das Date: 3 /17/2015
Das Time: 14:12:27
Das Day: 76

Audit Date 3 /17/2015
Audit Time 14:12:52
Audit Day 76

Low Channel:		High Channel:	
Avg Diff:	**Max Diff:**	**Avg Diff:**	**Max Diff:**
0.0001	0.0004	0.0001	0.0004

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/2/2010	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
2	0.0000	0.0000	0.0000	V	V	0.0000
2	0.1000	0.0999	0.0999	V	V	0.0000
2	0.3000	0.2998	0.2995	V	V	-0.0003
2	0.5000	0.4996	0.4995	V	V	-0.0001
2	0.7000	0.6995	0.6994	V	V	-0.0001
2	0.9000	0.8993	0.8993	V	V	0.0000
2	1.0000	0.9994	0.9990	V	V	-0.0004

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Tylan	AW710253	MAC426	Sandy Grenville	03/17/2015	Flow Rate	02023

Mfg	Tylan	
SN/Owner ID	FP9605011	03645
Parameter	MFC power supply	

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

DAS 1:		DAS 2:		
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	
0.67%	0.74%			

Cal Factor Zero	0
Cal Factor Full Scale	0
Rotometer Reading:	1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	-0.03	0.0000	0.04	l/m	l/m	
primary	leak check	0.000	0.000	-0.02	0.0000	0.03	l/m	l/m	
primary	test pt 1	1.503	1.487	1.36	0.0000	1.50	l/m	l/m	0.54%
primary	test pt 2	1.500	1.484	1.36	0.0000	1.50	l/m	l/m	0.74%
primary	test pt 3	1.501	1.485	1.36	0.0000	1.50	l/m	l/m	0.74%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**		**Status**	pass
Sensor Component	Filter Depth	**Condition**	-2.5 cm	**Status**	Fail
Sensor Component	Filter Position	**Condition**	Poor	**Status**	Fail
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	5.5 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	CM08460049	MAC426	Sandy Grenville	03/17/2015	Ozone	none

Slope:	0.99762	**Slope:**	0.00000
Intercept	-0.33402	**Intercept**	0.00000
CorrCoff	1.00000	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99405	**Intercept**	-0.42803
Cert Date	3/9/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.0%	1.6%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.07	0.50	0.32	ppb	
primary	2	29.90	30.50	30.01	ppb	-1.61%
primary	3	49.82	50.54	49.94	ppb	-1.19%
primary	4	79.99	80.89	80.31	ppb	-0.72%
primary	5	109.89	110.97	110.50	ppb	-0.42%

Sensor Component	Condition	Status
Cell B Noise	0.8 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.2	pass
Span	1.004	pass
Cell B Freq.	98.9 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.71 lpm	pass
Cell A Tmp.	36.5 C	pass
Cell A Pressure	733.5 mmHg	pass
Cell A Noise	0.4 ppb	pass
Cell A Freq.	81.4 kHz	pass
Cell A Flow	0.71 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	15105	MAC426	Sandy Grenville	03/17/2015	Temperature	none

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00343	**Intercept**	-0.06409
Cert Date	1/30/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.27	0.40		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.04	0.10	0.0000	0.5	C	0.4
primary	Temp Mid Range	25.64	25.62	0.0000	25.7	C	0.08
primary	Temp High Range	49.36	49.26	0.0000	48.9	C	-0.32

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

Shelter Temperature Data For

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
ARS	none	MAC426	Sandy Grenville	03/17/2015	Shelter Temperature	60

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
0.46	0.85		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00343	Intercept	-0.06409
Cert Date	1/30/2015	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	26.38	26.35	0.000	25.5	C	-0.85
primary	Temp Mid Range	25.70	25.68	0.000	25.2	C	-0.48
primary	Temp Mid Range	26.01	25.99	0.000	25.9	C	-0.05

Infrastructure Data For

Site ID	Technician	Site Visit Date
MAC426	Sandy Grenville	03/17/2015

Shelter Make	Shelter Model	Shelter Size
custom	N/A	1536 cuft

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operators are very knowledgeable with air quality monitoring. They are doing a very good job with site activities and filter handling.

2 **Parameter:** SitingCriteriaCom

Bowling Green is within 40 km of the site. The site is in a hay field which is harvested twice per year. The area to the west and south is comprised of livestock farms including cattle and poultry. The coordinates provided in the QAPP are incorrect.

3 **Parameter:** ShelterCleanNotes

The shelter is well maintained, clean, neat, and well organized.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	MAC426	**Technician**	Sandy Grenville	**Site Visit Date**	03/17/2015

Site Sponsor (agency)	NPS	**USGS Map**	Rhoda
Operating Group	NPS	**Map Scale**	
AQS #	21-061-0501	**Map Date**	
Meteorological Type	Climatronics		
Air Pollutant Analyzer	Ozone, SO2, NOy, Hg, IMPROVE, PM	**QAPP Latitude**	37.2806
Deposition Measurement	dry, wet, Hg	**QAPP Longitude**	-86.2639
Land Use	agriculture, woodland - mixed	**QAPP Elevation Meters**	236
Terrain	rolling	**QAPP Declination**	3
Conforms to MLM	Marginally	**QAPP Declination Date**	12/27/2004
Site Telephone	(270) 758-2136	**Audit Latitude**	37.131794
Site Address 1	Alfred Cook Road	**Audit Longitude**	-86.142953
Site Address 2		**Audit Elevation**	230
County	Edmonson	**Audit Declination**	-4.0
City, State	Smiths Grove, KY		**Present**
Zip Code	42171	**Fire Extinguisher**	☑ inspected March 2011
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** custom **Model** N/A **Shelter Size** 1536 cuft

Shelter Clean ☑ **Notes** The shelter is well maintained, clean, neat, and well organized.

Site OK ☑ **Notes**

Driving Directions From Bowling Green go east on 31W. Turn left (north) on 442 toward Pig. At the stop sign in Pig, turn right on route 259, or Brownsville Road. Continue approximately 1 mile, just past two churches (one on each side of the road). Take the 2nd left past the church on the left onto Chaumount Road. Then take the first left onto Doyle Road. Continue straight onto Alfred Cook Road. The site will be on the left approximately 0.6 miles.

Field Systems Data Form

F-02058-1500-S2-rev001

Site ID MAC426 **Technician** Sandy Grenville **Site Visit Date** 03/17/2015

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	35 km	☐
City 10,000 to 50,000 population	10 km		☑
City 1,000 to 10,000 population	5 km		☑
Major highway, airport or rail yard	2 km		☑
Secondary road, heavily traveled	500 m		☑
Secondary road, lightly traveled	200 m		☑
Feedlot operations	500 m		☑
Intensive agricultural ops (including aerial spraying)	500 m		☑
Limited agricultural operations	200 m	10 m	☐
Large parking lot	200 m		☑
Small parking lot	100 m		☑
Tree line	50 m		☑
Obstacles to wind	10 times obstacle height		☑

Siting Distances OK ☑

Siting Criteria Comment

Bowling Green is within 40 km of the site. The site is in a hay field which is harvested twice per year. The area to the west and south is comprised of livestock farms including cattle and poultry. The coordinates provided in the QAPP are incorrect.

Field Systems Data Form

F-02058-1500-S3-rev001

Site ID	MAC426	Technician	Sandy Grenville	Site Visit Date	03/17/2015

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-rev001

Site ID	MAC426	Technician	Sandy Grenville	Site Visit Date	03/17/2015

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

Parameter	Manufacturer	Model	S/N	Client ID
Met tower	Climatronics	illegible	illegible	none
Temperature	RM Young	41342	15105	none

Provide any additional 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-rev001

Site ID MAC426 **Technician** Sandy Grenville **Site Visit Date** 03/17/2015

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

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

Pollutant analyzers and deposition equipment operations and maintenance

1	Do the analyzers and equipment appear to be in good condition and well maintained?	☑	
2	Are the analyzers and monitors operational, on-line, and reporting data?	☑	
3	Describe ozone sample tube.		1/4 teflon by 10 meters
4	Describe dry dep sample tube.		3/8 teflon by 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

Parameter	Manufacturer	Model	S/N	Client ID
Sample Tower	Aluma Tower	B	none	none
Ozone	ThermoElectron Inc	49i A3NAA	CM08460049	none
Filter pack flow pump	Thomas	107CAB11A	109500000033	none
MFC power supply	Tylan	RO-32	FP9605011	03645
Zero air pump	Werther International	PC70/4	000665778	none

Provide any additional 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-rev001

Site ID MAC426 **Technician** Sandy Grenville **Site Visit Date** 03/17/2015

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?		

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Hewlett Packard	6730b	CNV0094B73	none
DAS	Environmental Sys Corp	8832	A3027	3027
Printer	Hewlett Packard	842C	unknown	none

Provide any additional 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-rev001

Site ID	MAC426	Technician	Sandy Grenville	Site Visit Date	03/17/2015

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	☑	DataView2	☑
SSRF	☑		☑
Site Ops Manual	☑		☑
HASP	☐		☐
Field Ops Manual	☐		☐
Calibration Reports	☑		☑
Ozone z/s/p Control Charts	☐		☐
Preventive maintenance schedul	☐		☐

1	Is the station log properly completed during every site visit?	☑	DataView
2	Are the Site Status Report Forms being completed and current?	☑	
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-rev001

Site ID MAC426 **Technician** Sandy Grenville **Site Visit Date** 03/17/2015

Site operation procedures

1	Has the site operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Receives training every 6 months during calibration visits
2	Has the backup operator attended a formal CASTNET training course? If yes, when and who instructed?	☑	Receives training every 6 months during calibration visits
3	Is the site visited regularly on the required Tuesday schedule?	☑	
4	Are the standard CASTNET operational procedures being flollowed by the site operator?	☑	
5	Is the site operator(s) knowledgeable of, and able to perform the required site activities? (including documentation)	☑	

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

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

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

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

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

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

Field Systems Data Form

F-02058-1500-S9-rev001

Site ID MAC426 **Technician** Sandy Grenville **Site Visit Date** 03/17/2015

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed various times
2	Are the Site Status Report Forms being completed and filed correctly?	☑	
3	Are data downloads and backups being performed as scheduled?	☐	No longer required
4	Are general observations being made and recorded? How?	☑	SSRF, logbook
5	Are site supplies on-hand and replenished in a timely fashion?	☑	
6	Are sample flow rates recorded? How?	☑	SSRF
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 and as needed	☑
Sample Line Check for Dirt/Water	☐		☐

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

The site operators are very knowledgeable with air quality monitoring. They are doing a very good job with site activities and filter handling.

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
CKT136-Sandy Grenville-03/18/2015						
1	3/18/2015	Computer	Dell	000247	D520	unknown
2	3/18/2015	DAS	Campbell	000354	CR3000	2132
3	3/18/2015	Elevation	Elevation	None	1	None
4	3/18/2015	Filter pack flow pump	Thomas	02361	107CA18	0290006116
5	3/18/2015	Flow Rate	Apex	000468	AXMC105LPMDPCV	illegible
6	3/18/2015	Infrastructure	Infrastructure	none	none	none
7	3/18/2015	Modem	Raven	06590	H4222-C	0844350343
8	3/18/2015	Ozone	ThermoElectron Inc	000744	49i A1NAA	1105347324
9	3/18/2015	Sample Tower	Aluma Tower	000822	B	none
10	3/18/2015	Shelter Temperature	Campbell	none	107-L	none
11	3/18/2015	Siting Criteria	Siting Criteria	None	1	None
12	3/18/2015	Temperature	RM Young	04689	41342VO	6703
13	3/18/2015	Zero air pump	Werther International	06902	PC70/4	000829157

DAS Data Form

DAS Time Max Error: 0.13

Mfg	Serial Number	Site	Technician	Site Visit Date	Parameter	Use Desc.
Campbell	2132	CKT136	Sandy Grenville	03/18/2015	DAS	Primary

Das Date: 3 /18/2015
Das Time: 12:16:57
Das Day: 77

Audit Date 3 /18/2015
Audit Time 12:17:05
Audit Day 77

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

Mfg	Datel	**Parameter**	DAS
Serial Number	15510194	**Tfer Desc.**	Source generator (D
Tfer ID	01320		
Slope	1.00000	**Intercept**	0.00000
Cert Date	2/2/2010	**CorrCoff**	1.00000

Mfg	Fluke	**Parameter**	DAS
Serial Number	95740135	**Tfer Desc.**	DVM
Tfer ID	01311		
Slope	1.00000	**Intercept**	0.00000
Cert Date	1/22/2015	**CorrCoff**	1.00000

Channel	Input	DVM Output	DAS Output	InputUnit	OutputUnit	Difference
7	0.0000	-0.0001	0.0000	V	V	0.0001
7	0.1000	0.0998	0.0999	V	V	0.0001
7	0.3000	0.2996	0.2999	V	V	0.0003
7	0.5000	0.4995	0.4998	V	V	0.0003
7	0.7000	0.6995	0.6994	V	V	-0.0001
7	0.9000	0.8993	0.8996	V	V	0.0003
7	1.0000	0.9992	0.9995	V	V	0.0003

Flow Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
Apex	illegible	CKT136	Sandy Grenville	03/18/2015	Flow Rate	000468

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103471	**Tfer Desc.**	nexus
Tfer ID	01420		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

Mfg	BIOS	**Parameter**	Flow Rate
Serial Number	103424	**Tfer Desc.**	BIOS cell
Tfer ID	01410		
Slope	0.96664	**Intercept**	0.03078
Cert Date	2/5/2015	**CorrCoff**	0.99996

DAS 1:		DAS 2:			
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**	**Cal Factor Zero**	-0.04
0.46%	0.60%			**Cal Factor Full Scale**	0.97
				Rotometer Reading:	1.5

UseDescription:	Test type:	Input l/m:	Input STP:	MfcDisp.:	OutputSignal:	Output S E:	InputUnit:	OutputSignalU	PctDifference:
primary	pump off	0.000	0.000	0.03	0.030	-0.01	l/m	l/m	
primary	leak check	0.000	0.000	0.01	0.010	-0.03	l/m	l/m	
primary	test pt 1	1.500	1.501	1.53	1.540	1.51	l/m	l/m	0.60%
primary	test pt 2	1.505	1.505	1.53	1.540	1.50	l/m	l/m	-0.33%
primary	test pt 3	1.508	1.507	1.53	1.540	1.50	l/m	l/m	-0.46%

Sensor Component	Leak Test	**Condition**		**Status**	pass
Sensor Component	Filter Azimuth	**Condition**	270 deg	**Status**	pass
Sensor Component	Filter Depth	**Condition**	0.5 cm	**Status**	pass
Sensor Component	Filter Position	**Condition**	Good	**Status**	pass
Sensor Component	Moisture Present	**Condition**	No moisture present	**Status**	pass
Sensor Component	Rotometer Condition	**Condition**	Clean and dry	**Status**	pass
Sensor Component	System Memo	**Condition**		**Status**	pass
Sensor Component	Tubing Condition	**Condition**	Good	**Status**	pass
Sensor Component	Filter Distance	**Condition**	4.0 cm	**Status**	pass

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347324	CKT136	Sandy Grenville	03/18/2015	Ozone	000744

Slope:	1.00406	**Slope:**	0.00000
Intercept	-0.50955	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99405	**Intercept**	-0.42803
Cert Date	3/9/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.9%	2.2%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.18	0.61	0.33	ppb	
primary	2	29.95	30.55	29.88	ppb	-2.19%
primary	3	49.90	50.62	50.11	ppb	-1.01%
primary	4	79.45	80.35	80.50	ppb	0.19%
primary	5	109.95	111.03	110.90	ppb	-0.12%

Sensor Component	Condition	Status
Cell B Noise	1.4 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.10	pass
Span	1.008	pass
Cell B Freq.	86.9 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	26.8 C	pass
Cell A Pressure	711.8 mmHg	pass
Cell A Noise	1.1 ppb	pass
Cell A Freq.	86.9 kHz	pass
Cell A Flow	0.81 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Temperature Data Form

Mfg	Serial Number Ta	Site	Technician	Site Visit Date	Parameter	Owner ID
RM Young	6703	CKT136	Sandy Grenville	03/18/2015	Temperature	04689

Mfg	Extech	**Parameter**	Temperature
Serial Number	H232734	**Tfer Desc.**	RTD
Tfer ID	01227		
Slope	1.00343	**Intercept**	-0.06409
Cert Date	1/30/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
Abs Avg Err	**Abs Max Er**	**Abs Avg Err**	**Abs Max Er**
0.38	0.47		

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Low Range	0.07	0.13	0.000	-0.2	C	-0.28
primary	Temp Mid Range	25.38	25.36	0.000	24.9	C	-0.47
primary	Temp High Range	48.40	48.30	0.000	47.9	C	-0.4

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

Infrastructure Data For

Site ID	CKT136	Technician	Sandy Grenville	Site Visit Date	03/18/2015

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

Sensor Component		Condition		Status	
Sensor Component	Shelter Roof	Condition	Poor	Status	Fail
Sensor Component	Sample Tower Type	Condition	Type B	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	Rotometer	Condition	Installed	Status	pass
Sensor Component	Conduit	Condition	N/A	Status	pass
Sensor Component	Sample Tower	Condition	Good	Status	pass
Sensor Component	Shelter Condition	Condition	Poor	Status	Fail
Sensor Component	Shelter Floor	Condition	Poor	Status	Fail
Sensor Component	Shelter Temp Control	Condition	Functioning	Status	pass
Sensor Component	Signal Cable	Condition	Good	Status	pass
Sensor Component	Tubing Type	Condition	3/8 teflon	Status	pass
Sensor Component	Shelter Door	Condition	Fair	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	CKT136	Sandy Grenville	03/18/2015	Shelter Temperature	none

DAS 1:		DAS 2:	
Abs Avg Err	Abs Max Er	Abs Avg Err	Abs Max Er
1.28	1.49		

Mfg	Extech	Parameter	Shelter Temperatur
Serial Number	H232734	Tfer Desc.	RTD
Tfer ID	01227		
Slope	1.00343	Intercept	-0.06409
Cert Date	1/30/2015	CorrCoff	1.00000

UseDesc.:	Test type:	InputTmpRaw	InputTmpCorr.:	OutputTmpSignal:	OutputSignalEng:	OSE Unit:	Difference:
primary	Temp Mid Range	21.93	21.92	0.000	20.9	C	-0.99
primary	Temp Mid Range	26.40	26.37	0.000	25.0	C	-1.37
primary	Temp Mid Range	27.30	27.27	0.000	25.8	C	-1.49

Field Systems Comments

1 **Parameter:** DasComments

Counterweights are present at the site to be installed on the sample tower. This should be performed as soon as possible to make it safer to lower the sample tower.

2 **Parameter:** ShelterCleanNotes

The shelter is very clean and well organized.

3 **Parameter:** PollAnalyzerCom

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

4 **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 shelter roof is leaking and the site operator is preparing to attempt repairs. The walls are beginning to show signs of rot.

Field Systems Data Form

F-02058-1500-S1-rev001

Site ID	CKT136	**Technician**	Sandy Grenville	**Site Visit Date**	03/18/2015

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		**Present**
Zip Code	41472	**Fire Extinguisher**	☑ No inspection date
Time Zone	Eastern	**First Aid Kit**	☐
Primary Operator		**Safety Glasses**	☑
Primary Op. Phone #		**Safety Hard Hat**	☑
Primary Op. E-mail		**Climbing Belt**	☐
Backup Operator		**Security Fence**	☑
Backup Op. Phone #		**Secure Shelter**	☑
Backup Op. E-mail		**Stable Entry Step**	☑

Shelter Working Room	☑	**Make**	Ekto	**Model**	8810 (s/n 2116-2)	**Shelter Size**	640 cuft
Shelter Clean	☑	**Notes**	The shelter is very clean and well organized.				
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-rev001

Site ID CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/18/2015

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-rev001

Site ID	CKT136	Technician	Sandy Grenville	Site Visit Date	03/18/2015

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-rev001

Site ID	CKT136	Technician	Sandy Grenville	Site Visit Date	03/18/2015

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?	☑	

Parameter	Manufacturer	Model	S/N	Client ID
Temperature	RM Young	41342VO	6703	04689

Provide any additional 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 shelter roof is leaking and the site operator is preparing to attempt repairs. The walls are beginning to show signs of rot.

Field Systems Data Form

F-02058-1500-S5-rev001

Site ID	CKT136	Technician	Sandy Grenville	Site Visit Date	03/18/2015

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

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

Pollutant analyzers and deposition equipment operations and maintenance

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

Parameter	Manufacturer	Model	S/N	Client ID
Ozone	ThermoElectron Inc	49i A1NAA	1105347324	000744
Filter pack flow pump	Thomas	107CA18	0290006116	02361
Zero air pump	Werther International	PC70/4	000829157	06902
Sample Tower	Aluma Tower	B	none	000822

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

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

Field Systems Data Form

F-02058-1500-S6-rev001

Site ID CKT136 **Technician** Sandy Grenville **Site Visit Date** 03/18/2015

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	

Parameter	Manufacturer	Model	S/N	Client ID
Computer	Dell	D520	unknown	000247
DAS	Campbell	CR3000	2132	000354
Modem	Raven	H4222-C	0844350343	06590

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

Counterweights are present at the site to be installed on the sample tower. This should be performed as soon as possible to make it safer to lower the sample tower.

Field Systems Data Form

F-02058-1500-S7-rev001

Site ID	CKT136	Technician	Sandy Grenville	Site Visit Date	03/18/2015

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-rev001

Site ID: CKT136 | Technician: Sandy Grenville | Site Visit Date: 03/18/2015

Site operation procedures

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

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

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

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

QC Check Performed		Frequency	Compliant
Multi-point Calibrations	☑	Semiannually	☑
Automatic Zero/Span Tests	☑	Daily	☑
Manual Zero/Span Tests	☐		☐
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-rev001

Site ID	CKT136	Technician	Sandy Grenville	Site Visit Date	03/18/2015

Site operation procedures

1	Is the filter pack being changed every Tuesday as scheduled?	☑	Filter changed usually at 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:

APPENDIX B

CASTNET Site Spot Report Forms

EEMS Spot Report

Data Compiled: 2/18/2015 12:31:05 PM

SiteVisitDate	Site	Technician
02/10/2015	EVE419	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Flow Rate average % difference	P	10	5	2	0.42	%	**P**
2	Flow Rate max % difference	P	10	5	2	0.52	%	**P**
3	DAS Time maximum error	P	0	5	1	3.57	min	**P**
4	DAS Voltage average error	P	16	0.003	28	0.0001	V	**P**
5	DAS Voltage average error	P	8	0.003	28	0.0001	V	**P**

SiteVisitDate	Site	Technician
02/10/2015	EVE419	Eric Hebert

Field Performance Comments

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

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

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Assistance was provided to the site operators regarding questions relating to the new SSRF. Corrections were made to the previous week's form to account for the non-routine sample duration.

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. ARS is repairing the leak in the roof.

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. This is a change from the previous temperature measurements which were made with an RTD in a forced-air aspirated shield at approximately 9 meters from the ground.

EEMS Spot Report

Data Compiled: 5/11/2015 8:32:54 AM

SiteVisitDate	Site	Technician
02/27/2015	CAD150	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	3	0.03	c	**P**
2	Temperature max error	P	4	0.5	3	0.05	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01673	unitless	**P**
4	Ozone Intercept	P	0	5	4	0.00908	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99992	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.0	%	**P**
7	Ozone % difference max	P	7	10	4	2.6	%	**P**
8	Flow Rate average % difference	P	10	5	2	0.18	%	**P**
9	Flow Rate max % difference	P	10	5	2	0.20	%	**P**
10	DAS Time maximum error	P	0	5	1	0.05	min	**P**
11	DAS Voltage average error	P	7	0.003	42	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	6	0.42	c	**P**
13	Shelter Temperature max error	P	5	1	6	0.52	c	**P**

Field Systems Comments

1 **Parameter:** SiteOpsProcedures

The ozone analyzer sample train filter is replaced and the system is leak tested monthly.

2 **Parameter:** ShelterCleanNotes

The bottom of the shelter walls are very badly deteriorated. The floor and ceiling have been repaired.

3 **Parameter:** MetOpMaintCom

The shelter is in poor condition. The bottom of the walls have rot damage. The front wall and the section below the heater are severely damaged by ants.

EEMS Spot Report

Data Compiled: 5/11/2015 11:14:20 AM

SiteVisitDate	Site	Technician
02/28/2015	CVL151	Sandy Grenville

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	0.26	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00543	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.58714	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.7	%	**P**
7	Ozone % difference max	P	7	10	4	1.9	%	**P**
8	Flow Rate average % difference	P	10	5	2	1.06	%	**P**
9	Flow Rate max % difference	P	10	5	2	1.32	%	**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	1	6	0.37	c	**P**
13	Shelter Temperature max error	P	5	1	6	0.50	c	**P**

Field Systems Comments

1 **Parameter:** DocumentationCo

The site operations manual does not apply to the currently installed instrumentation. The current HASP is not available onsite.

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 floor has been repaired since the previous audit visit, however the roof is still leaking.

EEMS Spot Report

Data Compiled: 5/11/2015 9:39:39 AM

SiteVisitDate	Site	Technician
03/13/2015	CDZ171	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.27	c	**P**
2	Temperature max error	P	4	0.5	9	0.48	c	**P**
3	Ozone Slope	P	0	1.1	4	1.01264	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.64212	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.5	%	**P**
7	Ozone % difference max	P	7	10	4	0.7	%	**P**
8	Flow Rate average % difference	P	10	5	3	0.35	%	**P**
9	Flow Rate max % difference	P	10	5	3	0.53	%	**P**
10	DAS Time maximum error	P	0	5	1	0.02	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	6	0.62	c	**P**
13	Shelter Temperature max error	P	5	1	6	0.67	c	**P**

SiteVisitDate	Site	Technician
03/13/2015	CDZ171	Sandy Grenville

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

Tower is still being lowered and the deposition filter changed without downing ozone channel. This is a new site operator who has been partially trained by the previous backup site operator. He would benefit from additional training. It was observed that he did not complete the SSRF correctly and was unsure of some of the required instrument checks.

2 **Parameter:** SitingCriteriaCom

The site is in a corn field with limited agricultural operations within 15 meters.

3 **Parameter:** ShelterCleanNotes

The shelter floor is beginning to rot again by the door. The shelter is still cluttered and dirty.

4 **Parameter:** PollAnalyzerCom

The zero air desiccant is saturated and should be replaced.

5 **Parameter:** MetSensorComme

The temperature sensor has been installed in a naturally aspirated shield on the sample tower.

EEMS Spot Report

Data Compiled: 5/11/2015 12:13:29 PM

SiteVisitDate	Site	Technician
03/15/2015	MCK131	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.17	c	**P**
2	Temperature max error	P	4	0.5	6	0.36	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99746	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.87322	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99995	unitless	**P**
6	Ozone % difference avg	P	7	10	4	2.3	%	**P**
7	Ozone % difference max	P	7	10	4	4.5	%	**P**
8	Flow Rate average % difference	P	10	5	4	0.29	%	**P**
9	Flow Rate max % difference	P	10	5	4	0.46	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	21	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	6	0.20	c	**P**
13	Shelter Temperature max error	P	5	1	6	0.42	c	**P**

Field Systems Comments

1 **Parameter:** ShelterCleanNotes

The shelter is neat, clean, and well organized.

EEMS Spot Report

Data Compiled: 5/11/2015 12:32:33 PM

SiteVisitDate	Site	Technician
03/15/2015	MCK231	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	9	0.21	c	**P**
2	Temperature max error	P	4	0.5	9	0.41	c	**P**
3	Ozone Slope	P	0	1.1	4	1.0075	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.57296	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	2.3	%	**P**
8	Flow Rate average % difference	P	10	5	2	1.28	%	**P**
9	Flow Rate max % difference	P	10	5	2	1.75	%	**P**
10	DAS Time maximum error	P	0	5	1	0.00	min	**P**
11	DAS Voltage average error	P	7	0.003	49	0.0002	V	**P**
12	Shelter Temperature average error	P	5	1	6	0.45	c	**P**
13	Shelter Temperature max error	P	5	1	6	0.76	c	**P**

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: 5/11/2015 11:53:12 AM

SiteVisitDate	Site	Technician
03/17/2015	MAC426	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.27	c	**P**
2	Temperature max error	P	4	0.5	6	0.40	c	**P**
3	Ozone Slope	P	0	1.1	4	0.99762	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.33402	ppb	**P**
5	Ozone correlation	P	0	0.995	4	1.00000	unitless	**P**
6	Ozone % difference avg	P	7	10	4	1.0	%	**P**
7	Ozone % difference max	P	7	10	4	1.6	%	**P**
8	Flow Rate average % difference	P	10	5	3	0.67	%	**P**
9	Flow Rate max % difference	P	10	5	3	0.74	%	**P**
10	DAS Time maximum error	P	0	5	1	0.42	min	**P**
11	DAS Voltage average error	P	2	0.003	35	0.0001	V	**P**
12	Shelter Temperature average error	P	5	1	9	0.46	c	**P**
13	Shelter Temperature max error	P	5	1	9	0.85	c	**P**

Field Systems Comments

1 **Parameter:** SiteOpsProcComm

The site operators are very knowledgeable with air quality monitoring. They are doing a very good job with site activities and filter handling.

2 **Parameter:** SitingCriteriaCom

Bowling Green is within 40 km of the site. The site is in a hay field which is harvested twice per year. The area to the west and south is comprised of livestock farms including cattle and poultry. The coordinates provided in the QAPP are incorrect.

3 **Parameter:** ShelterCleanNotes

The shelter is well maintained, clean, neat, and well organized.

EEMS Spot Report

Data Compiled: 5/11/2015 10:46:21 AM

SiteVisitDate	Site	Technician
03/18/2015	CKT136	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Temperature average error	P	4	0.5	6	0.38	c	**P**
2	Temperature max error	P	4	0.5	6	0.47	c	**P**
3	Ozone Slope	P	0	1.1	4	1.00406	unitless	**P**
4	Ozone Intercept	P	0	5	4	-0.50955	ppb	**P**
5	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
6	Ozone % difference avg	P	7	10	4	0.9	%	**P**
7	Ozone % difference max	P	7	10	4	2.2	%	**P**
8	Flow Rate average % difference	P	10	5	3	0.47	%	**P**
9	Flow Rate max % difference	P	10	5	3	0.60	%	**P**
10	DAS Time maximum error	P	0	5	1	0.13	min	**P**
11	DAS Voltage average error	P	7	0.003	28	0.0002	V	**P**
12	Shelter Temperature average error	P	5	1	12	1.28	c	**Fail**
13	Shelter Temperature max error	P	5	1	12	1.49	c	**Fail**

Field Systems Comments

1 **Parameter:** DasComments

Counterweights are present at the site to be installed on the sample tower. This should be performed as soon as possible to make it safer to lower the sample tower.

2 **Parameter:** ShelterCleanNotes

The shelter is very clean and well organized.

3 **Parameter:** PollAnalyzerCom

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

4 **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 shelter roof is leaking and the site operator is preparing to attempt repairs. The walls are beginning to show signs of rot.

APPENDIX C

CASTNET Ozone Performance Evaluation Forms

EEMS Spot Report

Data Compiled: 5/11/2015 12:42:03 PM

SiteVisitDate	Site	Technician
02/10/2015	SUM156	Alison Ray

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99871	unitless	**P**
2	Ozone Intercept	P	0	5	4	-1.22779	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99984	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.6	%	**P**
5	Ozone % difference max	P	7	10	4	2.4	%	**P**

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347328	SUM156	Alison Ray	02/10/2015	Ozone	000724

Slope:	0.00000	**Slope:**	0.00000
Intercept	0.00000	**Intercept**	0.00000
CorrCoff	0.00000	**CorrCoff**	0.00000

DAS 1:		**DAS 2:**	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.6%	2.4%		

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	49CPS-70008-364	**Tfer Desc.**	Ozone primary stan
Tfer ID	01110		
Slope	1.00952	**Intercept**	-0.24284
Cert Date	1/7/2015	**CorrCoff**	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.03	0.21	-1.97	ppb	
primary	2	30.70	30.65	29.92	ppb	-2.38%
primary	3	50.66	50.42	49.99	ppb	-0.85%
primary	4	84.22	83.66	82.60	ppb	-1.27%
primary	5	115.25	114.40	112.30	ppb	-1.84%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.3	pass
Span	0.999	pass
Cell B Freq.	114.8 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.77 lpm	pass
Cell A Tmp.	34.6 C	pass
Cell A Pressure	725 mmHg	pass
Cell A Noise	0.8 ppb	pass
Cell A Freq.	100.3 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SUM156-Alison Ray-02/10/2015						
1	2/10/2015	DAS	Campbell	000335	CR3000	2114
2	2/10/2015	Ozone	ThermoElectron Inc	000724	49i A1NAA	1105347328
3	2/10/2015	Ozone Standard	ThermoElectron Inc	000363	49i A3NAA	0726124691
4	2/10/2015	Sample Tower	Aluma Tower	03542	A	none
5	2/10/2015	Zero air pump	Werther International	06876	C 70/4	000814286

EEMS Spot Report

Data Compiled: 5/11/2015 12:39:23 PM

SiteVisitDate	Site	Technician
02/11/2015	IRL141	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98102	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.5518	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	2.8	%	**P**
5	Ozone % difference max	P	7	10	4	3.4	%	**P**

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347323	IRL141	Eric Hebert	02/11/2015	Ozone	000729

Slope:	0.98102	Slope:	0.00000
Intercept	-0.55180	Intercept	0.00000
CorrCoff	0.99999	CorrCoff	0.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
2.8%	3.4%		

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	0517112167	Tfer Desc.	Ozone primary stan
Tfer ID	01113		
Slope	1.00112	Intercept	0.01063
Cert Date	1/7/2015	CorrCoff	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.39	-0.40	-1.14	ppb	
primary	2	27.17	27.12	26.19	ppb	-3.43%
primary	3	51.49	51.42	49.93	ppb	-2.90%
primary	4	79.48	79.38	77.58	ppb	-2.27%
primary	5	110.83	110.69	107.80	ppb	-2.61%

Sensor Component	Condition	Status
Cell B Noise	0.6 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	1.025	pass
Cell B Freq.	99.1 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	33.3 C	pass
Cell A Pressure	736 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	107.2 kHz	pass
Cell A Flow	0.77 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
IRL141-Eric Hebert-02/11/2015						
1	2/11/2015	DAS	Campbell	000340	CR3000	2119
2	2/11/2015	Ozone	ThermoElectron Inc	000729	49i A1NAA	1105347323
3	2/11/2015	Ozone Standard	ThermoElectron Inc	000446	49i A3NAA	CM08200022
4	2/11/2015	Sample Tower	Aluma Tower	000020	B	AT-61152-A-H8-F
5	2/11/2015	UPS	APC	06790	RS900	unknown
6	2/11/2015	Zero air pump	Werther International	06898	C 70/4	000821905

EEMS Spot Report

Data Compiled: 5/11/2015 12:38:39 PM

SiteVisitDate	Site	Technician
02/25/2015	GAS153	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.01553	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.00623	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99997	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.7	%	**P**
5	Ozone % difference max	P	7	10	4	3.0	%	**P**

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1030244807	GAS153	Sandy Grenville	02/25/2015	Ozone	000705

Slope:	1.01553	**Slope:**	0.00000
Intercept	-0.00623	**Intercept**	0.00000
CorrCoff	0.99997	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99909	**Intercept**	-0.15598
Cert Date	1/27/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.7%	3.0%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.21	0.36	0.27	ppb	
primary	2	29.26	29.44	30.33	ppb	3.02%
primary	3	49.68	49.88	50.20	ppb	0.64%
primary	4	79.62	79.84	81.12	ppb	1.60%
primary	5	109.40	109.65	111.40	ppb	1.60%

Sensor Component	Condition	Status
Cell B Noise	1.2 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.000	pass
Span	1.000	pass
Cell B Freq.	100.1 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	30.7 C	pass
Cell A Pressure	703 mmHg	pass
Cell A Noise	1.0 ppb	pass
Cell A Freq.	99.5 kHz	pass
Cell A Flow	0.60 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

	Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
GAS153-Sandy Grenville-02/25/2015						
1	2/25/2015	DAS	Campbell	000635	CR3000	4934
2	2/25/2015	Ozone	ThermoElectron Inc	000705	49i A1NAA	1030244807
3	2/25/2015	Ozone Standard	ThermoElectron Inc	000371	49i A3NAA	0726124692
4	2/25/2015	Sample Tower	Aluma Tower	000138	B	none
5	2/25/2015	Zero air pump	Werther International	06865	C 70/4	000814277

EEMS Spot Report

Data Compiled: 5/11/2015 12:40:18 PM

SiteVisitDate	Site	Technician
03/01/2015	SND152	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.99947	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.18338	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.6	%	**P**
5	Ozone % difference max	P	7	10	4	1.4	%	**P**

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1106347326	SND152	Sandy Grenville	03/01/2015	Ozone	000725

Slope:	0.99947	**Slope:**	0.00000
Intercept	-0.18338	**Intercept**	0.00000
CorrCoff	0.99999	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99909	**Intercept**	-0.15598
Cert Date	1/27/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
0.6%	1.4%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.05	0.20	0.03	ppb	
primary	2	29.73	29.91	29.48	ppb	-1.44%
primary	3	49.65	49.85	49.99	ppb	0.28%
primary	4	79.59	79.81	79.45	ppb	-0.45%
primary	5	108.99	109.24	109.00	ppb	-0.22%

Sensor Component	Condition	Status
Cell B Noise	1.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.2	pass
Span	0.994	pass
Cell B Freq.	87.3 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.69 lpm	pass
Cell A Tmp.	26.9 C	pass
Cell A Pressure	702 mmHg	pass
Cell A Noise	1.0 ppb	pass
Cell A Freq.	95.6 kHz	pass
Cell A Flow	0.67 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SND152-Sandy Grenville-03/01/2015						
1	3/1/2015	DAS	Campbell	000357	CR3000	2135
2	3/1/2015	Ozone	ThermoElectron Inc	000725	49i A1NAA	1106347326
3	3/1/2015	Ozone Standard	ThermoElectron Inc	000220	49i A3NAA	0622717868
4	3/1/2015	Sample Tower	Aluma Tower	000148	B	none
5	3/1/2015	Zero air pump	Werther International	06867	C 70/4	000814279

EEMS Spot Report

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SiteVisitDate	Site	Technician
03/19/2015	SPD111	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00111	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.84251	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.5	%	**P**
5	Ozone % difference max	P	7	10	4	2.3	%	**P**

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347313	SPD111	Sandy Grenville	03/19/2015	Ozone	000742

Slope:	1.00111	**Slope:**	0.00000
Intercept	-0.84251	**Intercept**	0.00000
CorrCoff	0.99998	**CorrCoff**	0.00000

Mfg	ThermoElectron Inc	**Parameter**	ozone
Serial Number	0419606966	**Tfer Desc.**	Ozone primary stan
Tfer ID	01112		
Slope	0.99405	**Intercept**	-0.42803
Cert Date	3/9/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.5%	2.3%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.17	0.60	-0.07	ppb	
primary	2	29.79	30.39	29.68	ppb	-2.34%
primary	3	49.91	50.63	49.56	ppb	-2.11%
primary	4	79.96	80.86	79.77	ppb	-1.35%
primary	5	108.89	109.97	109.60	ppb	-0.34%

Sensor Component	Condition	Status
Cell B Noise	0.9 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.3	pass
Span	1.005	pass
Cell B Freq.	94.8 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.72 lpm	pass
Cell A Tmp.	33.5 C	pass
Cell A Pressure	701 mmHg	pass
Cell A Noise	1.2 ppb	pass
Cell A Freq.	96.3 kHz	pass
Cell A Flow	0.70 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
SPD111-Sandy Grenville-03/19/2015						
1	3/19/2015	DAS	Campbell	000342	CR3000	2121
2	3/19/2015	Ozone	ThermoElectron Inc	000742	49i A1NAA	1105347313
3	3/19/2015	Ozone Standard	ThermoElectron Inc	000450	49i A3NAA	CM08200026
4	3/19/2015	UPS	APC	06096	RS800	080331133278
5	3/19/2015	Zero air pump	Werther International	06928	C 70/4	000822222

EEMS Spot Report

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SiteVisitDate	Site	Technician
03/20/2015	COW137	Sandy Grenville

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	1.00572	unitless	**P**
2	Ozone Intercept	P	0	5	4	-0.36743	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99998	unitless	**P**
4	Ozone % difference avg	P	7	10	4	0.5	%	**P**
5	Ozone % difference max	P	7	10	4	1.4	%	**P**

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1105347314	COW137	Sandy Grenville	03/20/2015	Ozone	000726

Slope:	1.00572	Slope:	0.00000
Intercept	-0.36743	Intercept	0.00000
CorrCoff	0.99998	CorrCoff	0.00000

DAS 1:		DAS 2:	
A Avg % Diff:	A Max % Di	A Avg %Dif	A Max % Di
0.6%	1.4%		

Mfg	ThermoElectron Inc	Parameter	ozone
Serial Number	0419606966	Tfer Desc.	Ozone primary stan
Tfer ID	01112		
Slope	0.99405	Intercept	-0.42803
Cert Date	3/9/2015	CorrCoff	1.00000

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	0.04	0.47	0.06	ppb	
primary	2	29.89	30.49	30.07	ppb	-1.38%
primary	3	49.99	50.71	50.87	ppb	0.32%
primary	4	80.01	80.91	81.30	ppb	0.48%
primary	5	110.30	111.39	111.40	ppb	0.01%

Sensor Component	Condition	Status
Cell B Noise	0.8 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	0.2	pass
Span	1.02	pass
Cell B Freq.	98.6 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	1.4 lpm	Pass
Cell A Tmp.	32.7 C	pass
Cell A Pressure	683.4 mmHg	pass
Cell A Noise	0.9 ppb	pass
Cell A Freq.	115.3 kHz	pass
Cell A Flow	0.67 lpm	pass
Battery Backup	Functioning	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date	*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
COW137-Sandy Grenville-03/20/2015					
1 3/20/2015	DAS	Campbell	000401	CR3000	2529
2 3/20/2015	Ozone	ThermoElectron Inc	000726	49i A1NAA	1105347314
3 3/20/2015	Ozone Standard	ThermoElectron Inc	000441	49i A3NAA	CM08200017
4 3/20/2015	UPS	APC	none	650	unknown
5 3/20/2015	Zero air pump	Werther International	06878	C 70/4	000815254

EEMS Spot Report

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SiteVisitDate	Site	Technician
03/26/2015	ESP127	Eric Hebert

Line	Audited Parameter	DAS	Ch. #	Criteria +/-	Counts	QaResult	Units	Pass/Fail
1	Ozone Slope	P	0	1.1	4	0.98070	unitless	**P**
2	Ozone Intercept	P	0	5	4	0.19411	ppb	**P**
3	Ozone correlation	P	0	0.995	4	0.99999	unitless	**P**
4	Ozone % difference avg	P	7	10	4	1.6	%	**P**
5	Ozone % difference max	P	7	10	4	1.9	%	**P**

Ozone Data Form

Mfg	Serial Number Tag	Site	Technician	Site Visit Date	Parameter	Owner ID
ThermoElectron Inc	1009241785	ESP127	Eric Hebert	03/26/2015	Ozone	000622

Slope:	0.98070	**Slope:**	0.00000
Intercept	0.19411	**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	1.00952	**Intercept**	-0.24284
Cert Date	1/7/2015	**CorrCoff**	1.00000

DAS 1:		DAS 2:	
A Avg % Diff:	**A Max % Di**	**A Avg %Dif**	**A Max % Di**
1.6%	1.9%		

UseDescription:	ConcGroup:	Tfer Raw:	Tfer Corr:	Site:	Site Unit:	PctDifference:
primary	1	-0.04	0.20	0.40	ppb	
primary	2	30.69	30.64	30.10	ppb	-1.76%
primary	3	50.44	50.20	49.46	ppb	-1.47%
primary	4	84.31	83.75	82.60	ppb	-1.37%
primary	5	116.99	116.12	113.90	ppb	-1.91%

Sensor Component	Condition	Status
Cell B Noise	0.6 ppb	pass
Cell B Tmp.		pass
Fullscale Voltage	N/A	pass
Inlet Filter Condition	Clean	pass
Line Loss	Not tested	pass
Offset	-0.10	pass
Span	1.007	pass
Cell B Freq.	96.4 kHz	pass
System Memo		pass
Sample Train	Good	pass
Cell B Pressure		pass
Cell B Flow	0.54 lpm	pass
Cell A Tmp.	38.0 C	pass
Cell A Pressure	707.9 mmHg	pass
Cell A Noise	0.2 ppb	pass
Cell A Freq.	85.4 kHz	pass
Cell A Flow	0.54 lpm	pass
Battery Backup	N/A	pass
Zero Voltage	N/A	pass

Site Inventory by Site Visit

Site Visit Date		*Parameter*	*Mfg*	*Owner ID*	*Model Number*	*Serial Number*
ESP127-Eric Hebert-03/26/2015						
1	3/26/2015	DAS	Campbell	illegible	CR3000	3817
2	3/26/2015	Ozone	ThermoElectron Inc	000622	49i A1NAA	1009241785
3	3/26/2015	Ozone Standard	ThermoElectron Inc	000327	49i A3NAA	0622717852
4	3/26/2015	Zero air pump	Werther International	06874	C 70/4	000815256